



# MUNDIJONG DISTRICT STRUCTURE PLAN

Prepared for:



December 2018

Prepared by Hames Sharley:

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In collaboration with Cardno and SPP Consulting

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Project Ref. 43874

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## LIST OF ABBREVIATIONS

<b>ACP</b>	Activity Centre Plan
<b>BAL</b>	Bushfire Attack Level
<b>BMP</b>	Bushfire Management Plan
<b>CIDCP</b>	Community Infrastructure Development Contributions Plan
<b>CPTED</b>	Crime Prevention Through Environmental Design
<b>DIA</b>	Development Investigation Area
<b>DPLH</b>	Department of Planning, Land and Heritage
<b>DWMS</b>	District Water Management Strategy
<b>DWER</b>	Department of Water and Environmental Regulation
<b>HFTC</b>	High Frequency Transit Corridor
<b>LPS</b>	Local Planning Strategy
<b>LPS3</b>	Shire of Serpentine Jarrahdale Local Planning Scheme 3
<b>LSP</b>	Local Structure Plan
<b>MRS</b>	Metropolitan Region Scheme
<b>MRWA</b>	Main Roads Western Australia
<b>POS</b>	Public Open Space
<b>PTA</b>	Public Transport Authority
<b>SPP</b>	State Planning Policy
<b>SPS</b>	State Planning Strategy
<b>TEC</b>	Threatened Ecological Community
<b>TOD</b>	Transit Oriented Development
<b>TPS2</b>	Shire of Serpentine Jarrahdale Town Planning Scheme No. 2
<b>WAPC</b>	Western Australian Planning Commission
<b>WSUD</b>	Water Sensitive Urban Design

## ENDORSEMENT PAGE

This District Structure Plan is prepared under the provisions of the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2.

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

DATE

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

---

An officer of the Commission duly authorised by the Commission pursuant to section 16 of the Planning and Development Act 2005 for that purpose, in the presence of:

\_\_\_\_\_ Witness

\_\_\_\_\_ Date

\_\_\_\_\_ Date of Expiry

**TABLE OF AMENDMENTS**

AMENDMENT NO.	SUMMARY OF THE AMENDMENT	AMENDMENT TYPE	DATE APPROVED BY WAPC
Mundijong-Whitby District Structure Plan (August 2011)	Draft West Mundijong District Structure Plan included.  Revision of the Structure plan to incorporate the South Metropolitan and Peel Sub-regional Framework.	Major	

**TABLE OF DENSITY PLANS**

DENSITY PLAN NO.	AREA OF DENSITY PLAN APPLICATION	DATE ENDORSED BY WAPC

## EXECUTIVE SUMMARY

The rural village of Mundijong and adjoining area of Whitby was rezoned for urban purposes under the Metropolitan Region Scheme in 2006. The original Mundijong/Whitby District Structure Plan was drafted through an Enquiry by Design exercise and approved in March 2011.

The above District Structure Plan has now been revised to reflect changes in a number of State and local policies and incorporates a significant number of strategic documents (most notably the South Metropolitan and Peel Sub-regional Framework) that have been produced since the District Structure Plan was approved. Council has also made some strategic decisions that impact on the District Structure Plan including preparing the development framework for the Mundijong Industrial Area to the west of the original district structure plan.

This new document, the revised Mundijong District Structure Plan has, as its base documents, the two District Structure Plans below. A full list of the other documents that have influenced the Mundijong District Structure Plan are included in the reference section of this document.

- + Previous District Structure Plan for Mundijong Whitby District Structure Plan (2011) and supporting technical studies.
- + Draft West Mundijong Industrial Area District Structure Plan Report and supporting technical studies.

The District Structure Plan consolidates the above mentioned planning documents and generally replaces them or reconfirms their relevance in the planning framework. A Development Contribution Scheme and Development Contribution Plan has been drafted for the shared cost towards common infrastructure requirements. The document also refers to a Community Infrastructure Development Contribution Plan that provides for shared community infrastructure costs.

The Strategic Direction that has influenced the District Structure Plan is listed in Section 4. The actions that are required following on from the changes to the District Structure Plans are listed in the relevant tables.

The plan estimates a minimum population of 40,000 and potentially up to 50,000 people dependent upon the final distribution of densities and household sizes. It incorporates provision for a new town centre with the opportunity to ultimately link into the Perth urban rail network and promotes the relocation of the existing freight rail line traversing the subject area to its perimeter in conjunction with the construction of the Tonkin Highway extension. It also incorporates the new Mundijong Industrial Precinct and the addition of Development Investigation Areas as indicated by the Sub-regional framework.

There is a general presumption against subdivision until appropriate local structure planning has been completed. Local structure planning will be required to deliver the vision and objectives for Mundijong/Whitby outlined within the District Structure Plan.

## STRUCTURE PLAN CONTENT

This structure plan comprises:

### + Part One – Implementation Section

Includes the Mundijong District Structure Plan map and planning provisions.

### + Part Two – Explanatory Section

Provides an overview of how the Mundijong District Structure Plan responds to the existing planning framework and local context. It identifies the layers which informed the preparation of the Mundijong District Structure Plan.



**SUMMARY TABLE**

Item	Data	Structure Plan Reference
Total area covered by the structure plan	5,461 hectares	Section 1.2.2 'Area and Land Use'
Area of each land use proposed:		Section 3.2.2 'Land Use'
+ Residential	997 hectares	
+ Commercial	18 hectares	
+ Industrial	405 hectares	
+ Rural Residential	632 hectares	
Estimated number of dwellings	20,477 dwellings	Section 3.2.1 'Population and Density'
Estimated residential site density	25 dwellings per hectare	Section 3.2.1 'Population and Density'
Estimated population	59,179 people (at 2.89 people per household)	Section 3.2.1 'Population and Density'
Number of high schools	3	Section 3.5.1 'Education Facilities'
Number of primary schools	8	Section 3.5.1 'Education Facilities'
Estimated commercial floor space	42,000 m <sup>2</sup> net lettable area	Section 3.3.1 'Economy'
Estimated area and percentage of public open space given over to:		Section 3.5.2 'Public Open Space' Section 3.6 'Environment and Landscape'
+ Sub-Regional Open Space	63 hectares (1.2% coverage)	
+ District/Neighbourhood Open Space	28 hectares (0.5% coverage)	
+ Local Parks and Multiple Use Corridors	237 hectares (4.3% coverage)	
+ Estimated percentage of natural area	560 hectares (10.3% coverage)	Section 3.6 'Environment and Landscape'

# PART ONE

## IMPLEMENTATION







# 1.0 IMPLEMENTATION



## 1.1 Structure Plan Area

The Mundijong District Structure Plan shall apply to the land contained within the inner edge of the line denoting the structure plan boundary as shown on **Figure 1**.

## 1.2 Operation

The Mundijong District Structure Plan shall come into operation on the day it is approved by the Western Australian Planning Commission and will replace the 2011 Mundijong Whitby District Structure Plan and draft West Mundijong District Structure Plan. The Mundijong District Structure Plan is a strategic planning document intended to guide and coordinate more detailed planning in the form of Local Structure Plans within the Mundijong District Structure Plan area.

## 1.3 Staging

Staging of the Mundijong District Structure Plan will be dependent on population based triggers, which will determine the need for essential infrastructure such as:

- + Provision of services infrastructure;
- + Provision of community infrastructure (e.g. schools); and
- + Construction/upgrading of roads.

The Mundijong District Structure Plan also specifically recognises that initial phases of development are likely to be influenced by the presence of the Freight Rail Line.

As staging is dependent on population based triggers, timing for the Mundijong District Structure Plan has not been identified. The Mundijong District Structure Plan does therefore not specify development staging and Local Structure Plans will be expected to address this matter.

## 1.4 Subdivision and Development Requirements

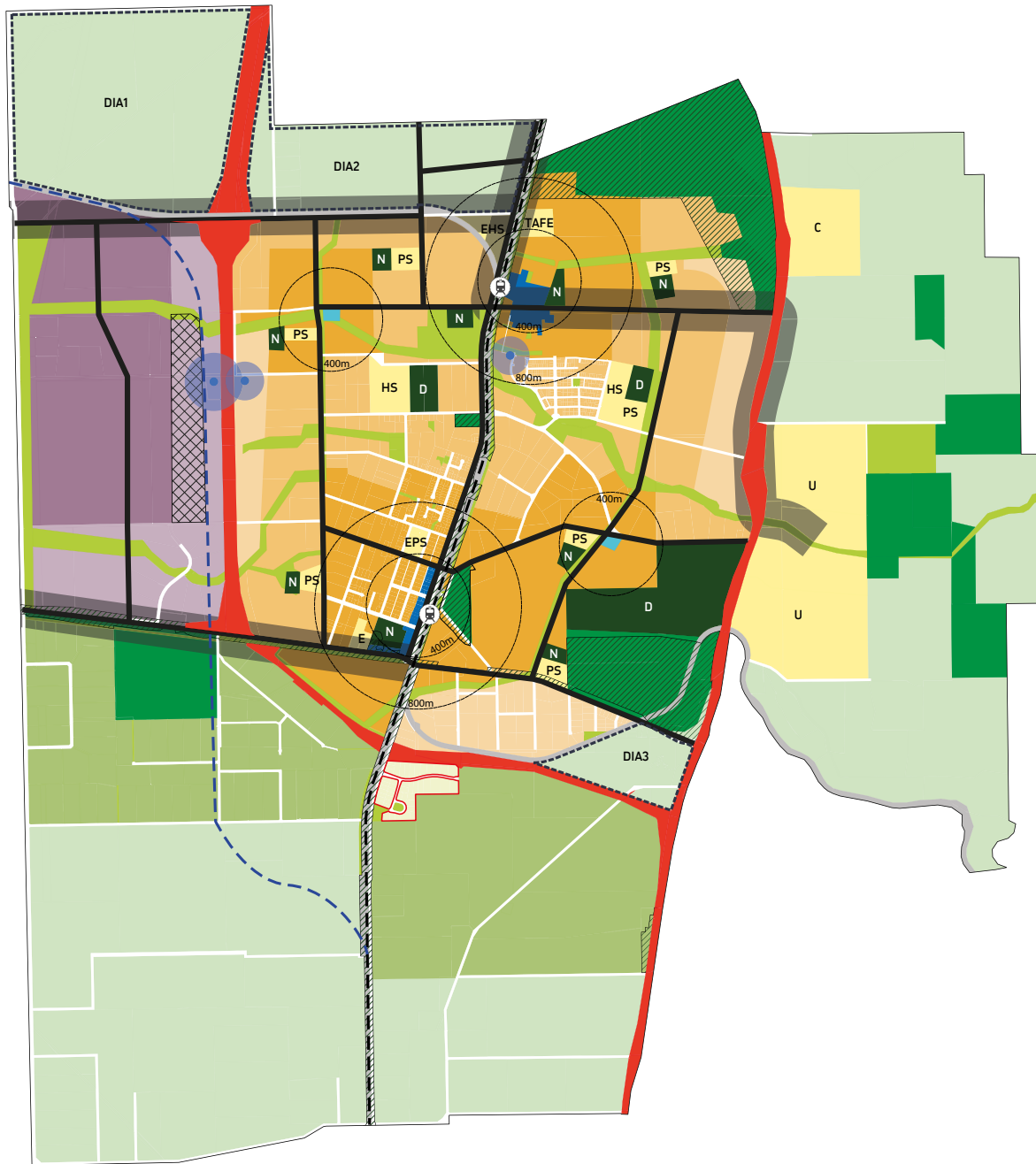
The land use arrangements, district level infrastructure and movement network illustrated in the Mundijong District Structure Plan will inform the Shire's response to requests for rezoning and more detailed Local Structure Plans (LSP) where these do not exist within the Mundijong District Structure Plan area. The layout illustrated on **Figure 1** represents a high level structural response to key issues which may be subject to refinement at more detailed stages of planning, at the discretion of the local government. Subdivision and development will be determined in accordance with the applicable zoning, planning scheme provisions, the Mundijong District Structure Plan and an approved LSP.

The Mundijong District Structure Plan identifies structure plan areas that specify that a LSP shall be prepared and approved in accordance with the Deemed Provisions for that area. Subdivision and development shall generally not be supported prior to the preparation and approval of a LSP where land has been identified within a structure plan area under the Mundijong District Structure Plan.

The local government may grant planning approval for a development or land use, or make recommendation to the Western Australian Planning Commission (WAPC) regarding a subdivision in the absence of a LSP where the local government considers the proposed development, land use or subdivision to be of a minor nature, which would not prejudice the preparation of a LSP.

Where land has not been identified within a structure plan area under the Mundijong District Structure Plan, subdivision and development must be in accordance with Part One and Part Two of the Mundijong District Structure Plan, including any specific requirements outlined under Section 1.7 of Part One of the Mundijong District Structure Plan.

Figure 1: Mundijong District Structure Plan



Mundijong District Structure Plan

Status : Preliminary (not to be used for feasibility purposes)  
Path : P:\A3874\Development Strategies for Serpentine-Jarrahdale

Scale 1:5,000 @ A1  
0 100 200 300 400

North

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 24/10/18

HAMES SHARLEY

LEGEND

- |  |                              |                                       |
|--|------------------------------|---------------------------------------|
| — MUNDIJONG DSP BOUNDARY                 | ■ MEDIUM - HIGH: R40-100     | ● WASTE WATER PUMP STATION AND BUFFER |
| ■ DISTRICT CENTRE                        | ■ LOW (SUBURBAN): R20-35     | --- DIA BOUNDARY                      |
| ■ NEIGHBOURHOOD CENTRE                   | ■ LOW (TRANSITIONAL): R10-15 | --- DEVELOPMENT INVESTIGATION AREA    |
| ■ COMMUNITY AND PUBLIC PURPOSE           | ■ SPECIAL USE                | ● EHS EXISTING HIGH SCHOOL            |
| ■ LIGHT INDUSTRIAL                       | ■ RURAL SMALL HOLDINGS       | ● EPS EXISTING PRIMARY SCHOOL         |
| ■ INDUSTRIAL                             | ■ RURAL                      | ● HS HIGH SCHOOL                      |
| ■ BUSH FOREVER                           | ■ PRIMARY DISTRIBUTOR        | ● PS PRIMARY SCHOOL                   |
| ■ DISTRICT/ NEIGHBOURHOOD OPEN SPACE     | ■ DISTRICT DISTRIBUTOR       | ■ D DISTRICT OPEN SPACE               |
| ■ RESERVE                                | ■ RAILWAY RESERVE            | ■ N NEIGHBOURHOOD OPEN SPACE          |
| ■ MULTIPLE USE CORRIDOR/LOCAL OPEN SPACE | --- FREIGHT RAIL REALIGNMENT | ■ U UNIVERSITY/ INNOVATION HUB        |
| ■ INTER-MODAL FACILITY                   | --- RAIL LINE                | ■ C CEMETERY                          |
| ■ HIGH FREQUENCY TRANSIT CORRIDOR        | ● TRANSIT NODE               | ■ E EMERGENCY SERVICES                |

## 1.5 General Provisions

The following provisions shall apply to all LSPs across the whole Mundijong District Structure Plan area:

- + LSPs prepared within the Mundijong District Structure Plan area should generally conform with the layout illustrated within the Mundijong District Structure Plan and be accompanied by:
  - A Local Water Management Strategy consistent with an approved District Water Management Strategy;
  - An Environmental Assessment Report;
  - A Bushfire Hazard Assessment and/or Bushfire Management Plan;
  - A Transport Impact Assessment
  - Landscape Design Guidelines that address measures to be adopted to implement both public and private landscaping that reflects the historic landscape character of Mundijong; and
  - Other submission requirements consistent with the Planning and Development (Local Planning Schemes) 2015 Schedule 2 – Deemed Provisions.
- + LSPs should establish objectives for built form and any design guidelines that are required to be established, typically as Local Planning Policies or Activity Centre Plans that are required prior to applications for developments and/or subdivision.

The following provisions shall apply to all LSPs, local development plans, subdivisions and developments across the whole Mundijong District Structure Plan area:

- + Maximise connectivity for vehicular, pedestrian and cycling transport networks both internally and to the surrounding street network.
- + Provide for a diversity of land uses, lot sizes, and housing types.
- + Provide public spaces, community facilities and meeting points to create an active, vibrant and engaging place to live and work in accordance with the Shire's Community Infrastructure Plans.
- + Reduce reliance on vehicles by creating a pedestrian-oriented community and providing for alternative modes of transport.
- + Preserve the existing character of the structure plan area including its scenic values, viewsapes and landscapes.
- + Design buildings and dwellings with a high level of adaptability to suit different lifecycle stages/changing demographic needs.
- + Create a distinctive and responsive built form that enhances the sense of place, community identity and character of Mundijong and Whitby.
- + Infrastructure shall be provided in accordance with Liveable Neighbourhoods and any local planning policy that varies Liveable Neighbourhoods to respond to specific situations within the Shire.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area.
- + Acknowledge and allow for appropriate interface with Bush Forever sites and other sites of environmental significance.
- + Protect and enhance significant environmental areas and their buffers. Where development is proposed near wetlands, a Wetland Management Strategy is required at Local Structure Plan stage and a Wetland Management Plan is required at subdivision stage.
- + Maximise the efficient use and reuse of water by conserving water through efficiency and facilitating water reuse and fit-for-purpose use.
- + Reduce consumption of non-renewable resources via climate responsive design, efficient use of energy and water and increased use of renewable energy.
- + Planning and design to make allowance for adequate road and verge widths to accommodate the service alignments of a possible future dual water supply system and the property connections there from.



- + Provide “smart” mass public transport infrastructure to move people and goods both north and west.
- + Identify, protect and enhance Multiple Use Corridors and ensure water sensitive urban design elements are incorporated in stormwater management.
- + Where development is proposed near wetlands, a Wetland Management Strategy is required at Local Structure Plan stage and a Wetland Management Plan is required at subdivision stage.
- + Respond to the Community vision contained in SJ2050 (Strategic Community Plan) with specific reference to the core values, vision outcomes and guiding aspirations contained there.
- + Such other information as may reasonably be required by the local government or the WAPC.

## 1.6 Local Structure Plans

A small number of existing LSPs have been prepared and approved within the Mundijong District Structure Plan to provide more detailed planning and development guidance. These LSPs should be considered in conjunction with the Mundijong District Structure Plan.

In total, the Mundijong District Structure Plan contains twelve distinct LSP Areas (**Figure 2**). **Table 1** identifies the status of these LSP Areas, identifying LSPs that currently operate within the Mundijong District Structure Plan area from the time which the District Structure Plan was drafted and areas where no LSP exists.

**Table 1: Mundijong Local Structure Plan Areas**

LPS AREA	AREA DESCRIPTION	STATUS
Area A	Whitby	Approved
Area B	Keirnan Street	No LSP exists
Area C	Watkins Road North	No LSP exists
Area D	Watkins Road South	No LSP exists
Area E (1)	Mundijong West Precinct E1 Taylor Road and Adams Street, Mundijong; and	Approved
Area E (2)	Mundijong West Precinct E2 L50 Cockram Street and L119 Sparkman Road, Mundijong.	Approved
Area E (3)	Mundijong West Precinct E3	No LSP exists
Area F (1-8)	Mundijong Town Centre	No LSP exists
Area G	Mundijong North	No LSP exists
Area H	North Mundijong Industrial	No LSP exists
Area I	West Mundijong Industrial	No LSP exists
Area J	South-West Mundijong Industrial	No LSP exists
Area K	East Mundijong Industrial	No LSP exists
Area L	South-East Mundijong Industrial	No LSP exists

Development of detailed LSP's must be in accordance with the relevant LSP Areas identified. There is a general presumption that no further subdivision shall proceed within LSP Areas unless subject to an approved LSP. For areas where a LSP does not exist or is yet to be approved, or where a LSP is considered to potentially require significant modification, the Mundijong District Structure Plan outlines specific matters required to be addressed in the preparation and/or modification of a LSP for that particular LSP Area.

The following sub-sections outline the matters to be addressed for LSP Areas where a LSP does not exist, is yet to be approved or may require significant modification applicable to individual areas .

### 1.6.1 LSP AREA A - WHITBY

- + LSP Area A is bounded by South Western Highway in the east, Norman Road to the north, Soldiers Road to the west and Manjedal Brook to the south.
- + The Whitby Precinct A LSP has been approved.

#### **Key matters to be addressed:**

- + Subject to outcomes of METRONET investigations for extension of the Armadale rail line to Byford, development of a local bus service with regional connections and an interim transit hub in the main town centre.
- + Consideration of a passenger rail station at the Whitby Activity Centre.
- + Consideration of a Central TAFE or similar site for tertiary learning in close proximity to the Whitby Activity Centre.
- + Crossing of the rail line to the west of the Whitby Activity Centre.
- + Access to South Western highway from Reilly road.
- + Integration of health facilities within the Whitby Activity Centre to support a local employment base which provides for locally available infrastructure and services.
- + A foreshore management plan is required for the Manjedal Brook reserve between Paterson Road and South Western Highway (both sides) including actions, roles and responsibilities for implementation.
- + The identification of at least a 10 ha site, to the satisfaction of the Department of Education, for the purpose of a public high school in the location indicated within Precinct A within the District Structure Plan.
- + Integration of two sites for the purposes of public primary schools generally in the location indicated in the District Structure Plan. The final location of the primary school sites within a Local Structure Plan shall be determined in accordance with Liveable Neighbourhoods Element 8 and in liaison with the Shire and Department of Education.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area.
- + Preparation of a separate Activity Centre Plan for the activity centre at Whitby.

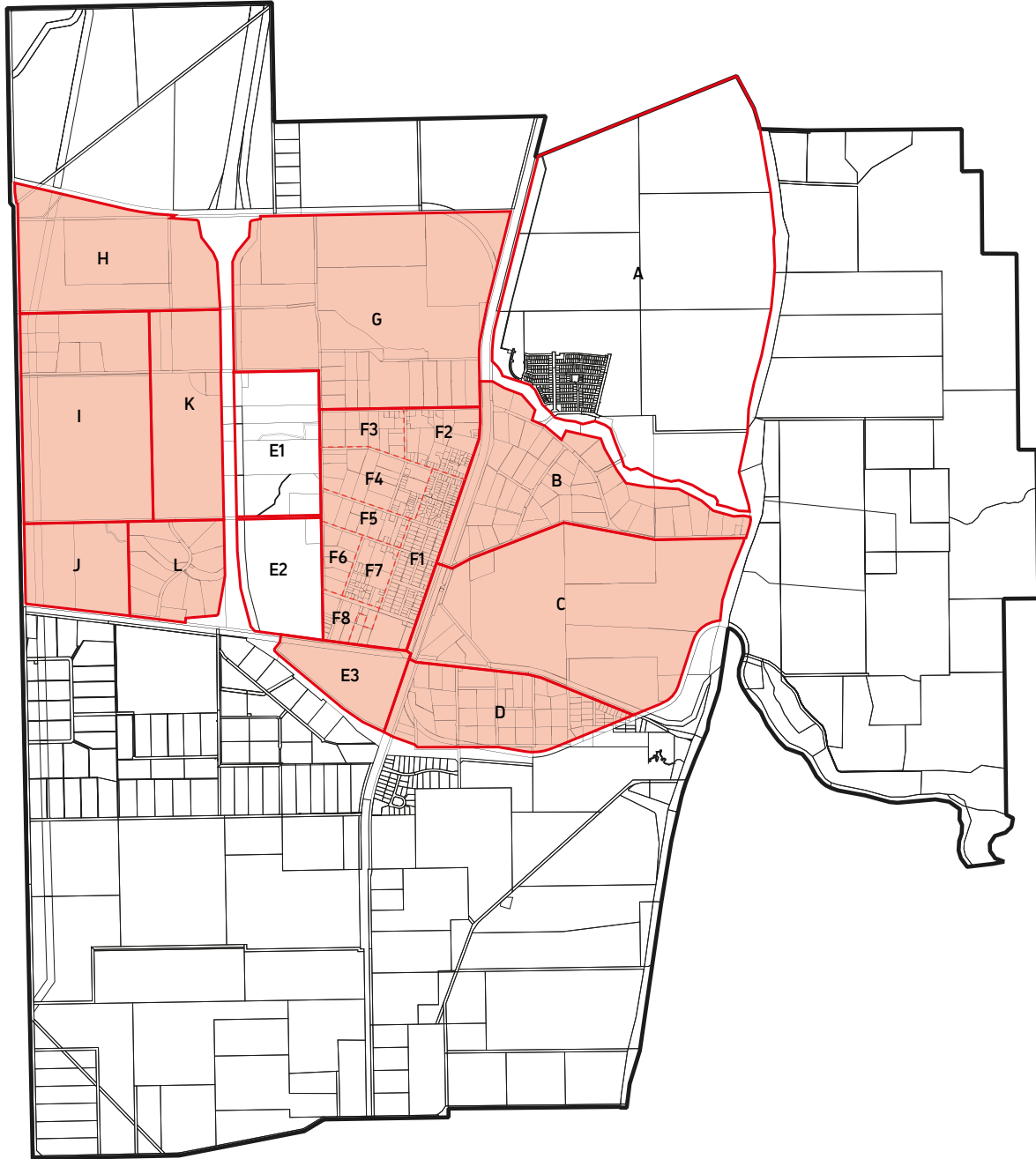
### 1.6.2 LSP AREA B -KEIRNAN STREET

- + LSP Area B is bounded by South Western Highway to the east, Soldiers Road to the west, Evelyn and Galvin Roads to the south and Manjedal Brook to the north.
- + A LSP shall be prepared for all or a portion of the precinct with the extent of the Local Structure Plan to be determined in liaison with the Shire of Serpentine-Jarrahdale, prior to lodgement of an LSP application.

#### **Key matters to be addressed:**

- + Link pathways onto the north-south principle shared path along Soldiers road which connects north to Byford and south the Serpentine.
- + Preserve the existing rural, "leafy green" character of the structure plan area including its scenic values, viewsapes and landscapes.
- + Enhance the green network through the creation of multiple green linkages.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Retain and protect Bush Forever sites and rehabilitate nearby areas to establish fauna linkages.
- + Verify, retain and protect local natural areas.
- + A foreshore management plan is required for the Manjedal Brook reserve between Paterson Road and South Western Highway (both sides) including actions, roles and responsibilities for implementation..

Figure 2: Mundijong Local Structure Plan Areas



Mundijong Structure Plan Areas

Status: Preliminary (not to be used for feasibility purposes)  
Path: F:\2018\Development Strategies for Serpentine-Jarrahdale




Scale: 1:5,000 @ A1



Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 24/10/18



**LEGEND**

-  MUNDIJONG DSP BOUNDARY
-  BOUNDARY OF APPROVED LSP
-  LSP PRECINCT (WITHOUT APPROVED LSP)

- + Noise mitigation measures as required under appropriate policy requirements including SPP 5.4 are to be addressed for proposed development adjacent the existing rail reserve to the west and South Western Highway to the east.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area.

### 1.6.3 LSP AREA C - WATKINS ROAD NORTH

- + LSP Area C is bounded by South Western Highway to the east, Evelyn and Galvin Roads to the north, Paterson Road to the west and Watkins Road to the south.
- + A LSP shall be prepared for all or a portion of the precinct with the extent of the Local Structure Plan to be determined in liaison with the Shire of Serpentine Jarrahdale, prior to lodgement of an LSP application.

#### **Key matters to be addressed:**

- + Integration of two sites for the purposes of public primary schools generally in the location indicated in the District Structure Plan. The final location of the primary school sites within a Local Structure Plan shall be determined in accordance with Liveable Neighbourhoods Element 8 and in liaison with the Shire and Department of Education.
- + Create a small Neighborhood Centre that provides for local services and facilities, in accordance with the principals contained within Liveable Neighbourhoods.
- + Create a north-south road connection linking Keirnan Street to Watkins Road.
- + Reinforce pedestrian and cycle connections to the existing Mundijong Station.
- + Link pathways onto the north-south principle shared path along Soldiers road which connects north to Byford and south to Serpentine.
- + Undertake detailed floristic surveys around Threatened Ecological Communities (TECs) and for protected flora and fauna where any clearing of remnant vegetation is proposed.
- + Retain and protect Bush Forever sites and rehabilitate nearby areas to establish fauna linkages.
- + Verify, retain and protect local natural areas.
- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Enhance the green network through the creation of multiple green linkages.
- + Noise mitigation measures as required under appropriate policy requirements including SPP 5.4 are to be addressed for proposed development adjacent the existing rail reserve to the west.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area.

### 1.6.4 LSP AREA D - WATKINS ROAD SOUTH

- + LSP Area D is formed by the Tonkin Highway Reservation in the south, the old rail reservation to the east, Watkins Road to the north and Wright Road to the west.
- + A LSP shall be prepared for the entire precinct.

#### **Key matters to be addressed:**

- + Reduce reliance on vehicles by creating a pedestrian-oriented community and providing for alternative modes of transport.
- + Noise mitigation measures as required under appropriate policy requirements including SPP 5.4 are to be addressed for proposed development adjacent the existing rail reserve to the west and Tonkin Highway reservation to the south
- + Enhance the green network through the creation of multiple green linkages.
- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Undertake an Aboriginal Heritage site survey, with any relevant applications under the Aboriginal Heritage Act being undertaken and approved prior to lodgement of a structure plan.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area.

### 1.6.5 LSP AREA E - MUNDIJONG WEST

- + LSP Area E is bounded by Taylor Road, Adonis Street and Wright Road to the east, the Tonkin Highway reservation to the south and west, and Scott Road to the north.
- + LSPs have been prepared and approved by the Shire of Serpentine-Jarrahdale for Mundijong E1 and E2 precincts.
- + A LSP shall be prepared for the remaining Mundijong E3 precinct.

#### **Key matters to be addressed:**

- + Noise mitigation measures as required under appropriate policy requirements including SPP 5.4 are to be addressed for proposed development adjacent the future Tonkin Highway reservation to the west and south.
- + LSP's should confirm the extent of the proposed service corridor to the east of Tonkin Highway and pump station site. The pump station will require an odour buffer of at least 150m radius. This should preferably be co-located with POS and drainage areas.
- + Integration of two sites for the purposes of public primary schools generally in the location indicated in the District Structure Plan. The final location of the primary school sites within a Local Structure Plan shall be determined in accordance with Liveable Neighbourhoods Element 8 and in liaison with the Shire and Department of Education.
- + Enhance the green network through the creation of multiple green linkages.
- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area

### 1.6.6 LSP AREA F - MUNDIJONG TOWN CENTRE

- + LSP Area F is bounded by Paterson Street in the east, Keirnan Street to the north, Adonis Street and Taylor Road to the west and Mundijong Road to the south.
- + A LSP shall be prepared for all or a portion of the precinct with the extent of the Local Structure Plan to be determined in liaison with the Shire of Serpentine-Jarrahdale.

#### **Key matters to be addressed:**

- + Retention of the existing character of the town centre enhancing its sense of place, community and identity.
- + Create a strong local employment base which provides for locally available infrastructure and services.
- + Enhance the Civic (governance) precinct located within the existing Town Centre.
- + Protect the Emergency Services precinct located on Mundijong Road.
- + Support health facilities in Town Centre which are able to serve the ageing population.
- + Create a vibrant and attractive place that offers a range of lifestyle choices and a liveable environment, supporting a safe, healthy and active community.
- + Enhance the green network through the creation of multiple green linkages.
- + Noise mitigation measures as required under appropriate policy requirements including SPP 5.4 are to be addressed for proposed development adjacent the existing rail reserve to the east.
- + Undertake an Aboriginal Heritage site survey, with any relevant applications under the Aboriginal Heritage Act being undertaken and approved prior to lodgement of a structure plan.
- + Prepare a separate Activity Centre Plan for the Civic Precinct.
- + Provision of a passenger rail station for the Civic Precinct.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area.

### 1.6.7 LSP AREA G - MUNDIJONG NORTH

- + LSP Area G is bounded by Soldiers Road to the east, Bishop Road to the north, the Tonkin Highway reservation to the west and Keirnan Street and Scott Road to the south.
- + A LSP shall be prepared for all or a portion of the precinct with the extent of the Local Structure Plan to be determined in liaison with the Shire of Serpentine-Jarrahdale.

#### **Key matters to be addressed:**

- + Identification of two sites for the purpose of public primary schools and one high school, generally in the location indicated in the District Structure Plan. The location of the primary school and high school sites within a Local Structure Plan shall be determined in accordance with Liveable Neighbourhoods Element 8 and in liaison with the Shire and Department of Education.
- + Create a small Neighbourhood Centre that provides for local services and facilities.
- + Create an east-west road connection from Taylor Road to Soldiers Road linking across Soldiers Road and the rail reserve to the Whitby District Centre.
- + Create a north-south road connection linking to Bishop Road.
- + Noise mitigation measures as required under appropriate policy requirements including SPP 5.4 are to be addressed for noise generated from the future Tonkin Highway Reservation to the west and the rail reservation to the east.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Undertake an Aboriginal Heritage site survey, with any relevant applications under the Aboriginal Heritage Act being undertaken and approved prior to lodgment of a structure plan.
- + Undertake detailed floristic surveys around TECs and for protected flora and fauna where any clearing of remnant vegetation is proposed.
- + Retain and protect Bush Forever sites and rehabilitate nearby areas to establish fauna linkages.
- + Verify, retain and protect local natural areas.
- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area

### 1.6.8 LSP AREA H - NORTH MUNDIJONG INDUSTRIAL

- + LSP Area H is bounded by the southwest freight rail reservation to the north and Kargotich Road to the west, Leipold Road to the south and the Tonkin Highway Road Reservation to the east.
- + A LSP shall be prepared for the entire precinct.

#### **Key matters to be addressed:**

- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Create a strong local employment base which provides for locally available infrastructure and services.
- + Create a north-south road connection connecting Bishop Road to Mundijong Road, central to the industrial precinct.
- + Address road widths to cater for freight movement having a vehicle length of 36.5m.
- + Plan for the freight rail realignment and connections to a future intermodal terminal.
- + Enhance the green network through the creation of multiple green linkages.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.

- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Undertake an Aboriginal Heritage site survey, with any relevant applications under the Aboriginal Heritage Act being undertaken and approved prior to lodgement of a structure plan.
- + Consideration for a third pipe system to promote waste water recycling within the District Structure Plan area, as well as a waste water treatment plant to service the Mundijong District.

#### 1.6.9 LSP AREA I - WEST MUNDIJONG INDUSTRIAL

- + LSP Area I is bounded by Kargotich Road to the west, Leipold Road to the north, Sparkman Road to the south, and property boundaries to precinct K to the east.
- + A LSP shall be prepared for all or a portion of the precinct with the extent of the Local Structure Plan to be determined in liaison with the Shire of Serpentine-Jarrahdale.

##### **Key matters to be addressed:**

- + Enhance the employment of the area with industrial development.
- + Create a north-south road connection linking Bishop Road to Mundijong Road, central to the industrial precinct.
- + Address road widths to cater for freight movement having a vehicle length of 36.5m.
- + Enhance the green network through the creation of multiple green linkages.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Preserve fringing vegetation along roads, waterways and rail corridors.

#### 1.6.10 LSP AREA J - SOUTH-WEST MUNDIJONG INDUSTRIAL

- + LSP Area J is bounded by Kargotich Road to the west, Mundijong Road to the south, property boundaries to precinct L to the east, and precinct I to the north.
- + A LSP shall be prepared for the entire precinct.

##### **Key matters to be addressed:**

- + Enhance the employment of the area with light industrial development.
- + Create a north-south road connection connecting Bishop Road to Mundijong Road, central to the industrial precinct.
- + Address road widths to cater for freight movement having a vehicle length of 36.5m.
- + Enhance the green network through the creation of multiple green linkages.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Preserve fringing vegetation along roads, waterways and rail corridors.

#### 1.6.11 LSP AREA K - EAST MUNDIJONG INDUSTRIAL

- + LSP Area K is bounded by property boundaries to precinct H to north, I to the west, and L to the south.
- + A LSP shall be prepared for the entire precinct.

##### **Key matters to be addressed:**

- + Enhance the employment of the area with industrial development.
- + Address road widths to cater for freight movement having a vehicle length of 36.5m.
- + Plan for the freight rail realignment addressing connections to a future intermodal terminal.
- + Enhance the green network through the creation of multiple green linkages, applying a 50m buffer around the

existing CCW to the north of the precinct (Manjedal Brook)

- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Light industrial classification to be developed and preserved for the purpose of an Intermodal Transport facility, in conjunction with the freight rail. Interim development provisions should be included to support development prior to an intermodal transport facility being viable.

### 1.6.12 LSP AREA L - SOUTH-EAST MUNDIJONG INDUSTRIAL

- + LSP Area L is bounded by Mundijong Road to the south and the Tonkin Highway extension to the east of the District Structure Plan area, precinct k to the north and precinct J to the west.
- + A LSP shall be prepared for the entire precinct.

#### **Key matters to be addressed:**

- + Enhance the employment of the area with light industrial development.
- + Create a north-south road connection connecting Bishop Road to Mundijong Road.
- + Address road widths to cater for freight movement having a vehicle length of 36.5m.
- + Plan for the freight rail realignment and connections to a future intermodal terminal.
- + Enhance the green network through the creation of multiple green linkages.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.
- + Preserve fringing vegetation along roads, waterways and rail corridors.
- + Address whether Pure Steel Lane will remain open with an access to Mundijong Road, when Tonkin Highway is constructed

## 1.7 Other Requirements

All urban development within the Mundijong District Structure Plan area is / will be subject to:

- + The Mundijong Development Contribution Plan (being Development Contribution Area 3 (DCA3) within the current revision); and
- + The Community Infrastructure Development Contribution Plan (current revision).

All industrial development within the Mundijong District Structure Plan area is / will be subject to:

- + The Mundijong Development Contribution Plan (being Development Contribution Area 2 (DCA2) within the current revision).

### 1.7.1 DEVELOPMENT INVESTIGATION AREAS

The Mundijong District Structure Plan identifies three development investigation areas (DIA). Future planning and development in these areas shall have consideration for **Table 2**.



Table 2: Development Investigation Area

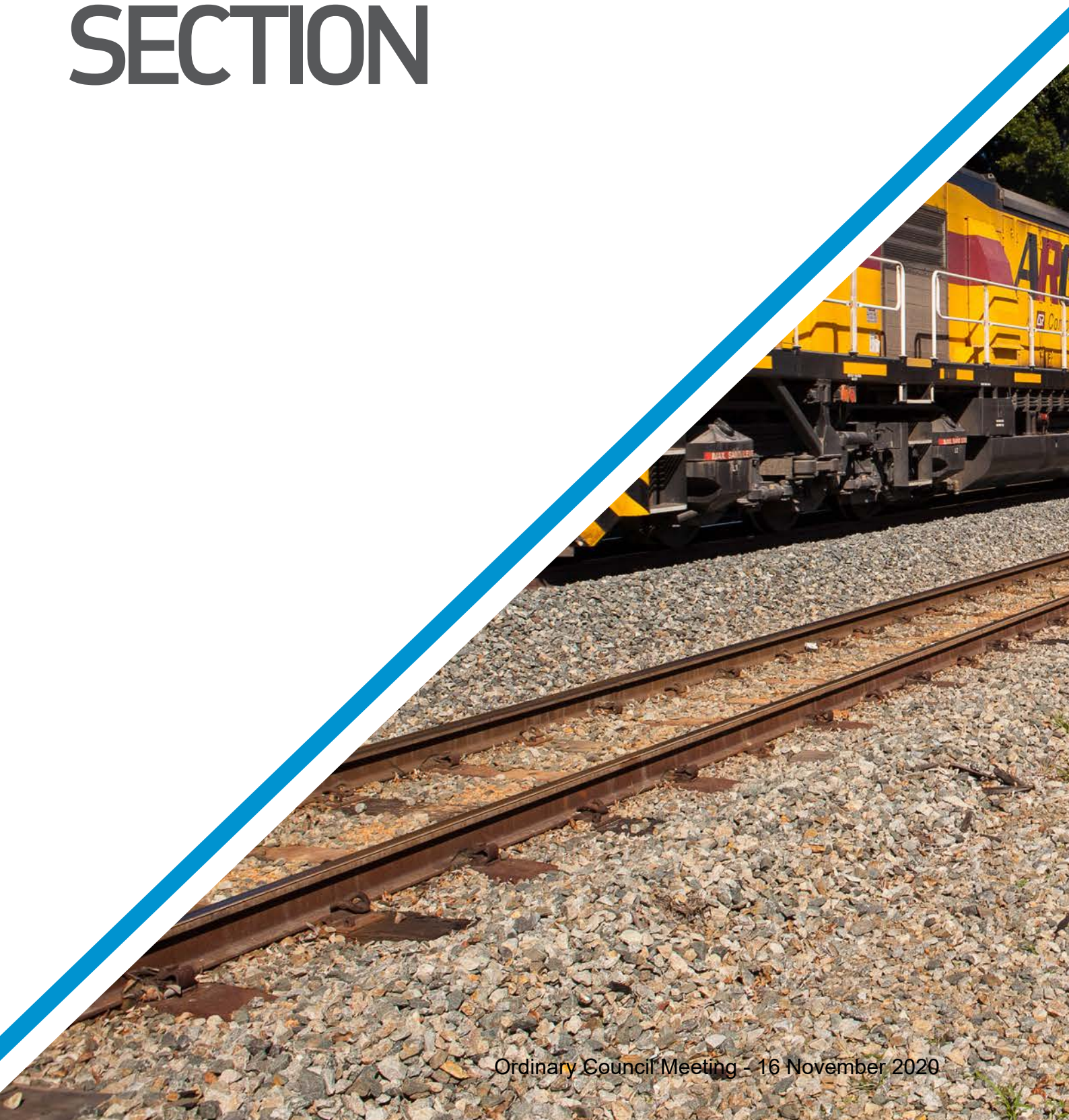
Area	Key Considerations
DIA1 - West of Tonkin Highway / North of Bishop Road	<p>The purpose and intent of DIA1 is to investigate the appropriateness of a rural enterprise cluster. Investigations should consider the following:</p> <ul style="list-style-type: none"> <li>+ Environmental factors;</li> <li>+ Extent of area;</li> <li>+ Identify infrastructure requirements;</li> <li>+ Preferred land uses and land use compatibility; from the Mundijong Industrial area and transportation infrastructure;</li> <li>+ Servicing requirements;</li> <li>+ Road capacity;</li> <li>+ Buffer requirements from amongst others the Mundijong Industrial area and transportation infrastructure;</li> <li>+ Bushfire hazard;</li> <li>+ Impact of visual amenity and landscape;</li> <li>+ Opportunities to link general freight transfer to the intermodal hub; and</li> <li>+ Any other requirements that may be determined by the Shire of Serpentine Jarrahdale or State government agencies.</li> </ul> <p>Note: No subdivision proposals will be permitted pre-2050 unless they provide convincing rationale for and solutions to the above matters.</p>
DIA2 - East of Tonkin Highway / North of Bishop Road	<p>The purpose and intent of DIA2 is to explore the potential for urban expansion with consideration for innovative housing opportunities. A structure plan will be required which addresses the following matters:</p> <ul style="list-style-type: none"> <li>+ Investigate opportunities for innovative housing typologies that have consideration for best practice sustainability;</li> <li>+ Exemplar resource and energy efficiency;</li> <li>+ Water minimisation;</li> <li>+ Alternate construct methods.</li> <li>+ Investigate current zoning and land uses;</li> <li>+ Manage the transition of land uses most specifically to the north;</li> <li>+ Better utilize available land;</li> <li>+ Deliver innovative land use and housing diversity and choice;</li> <li>+ Reduce the need for people to travel by car;</li> <li>+ Identify infrastructure requirements;</li> <li>+ Servicing requirements;</li> <li>+ Visual/landscape protection;</li> <li>+ Bushfire hazard;</li> <li>+ Interface with Bishop Road, Soldiers Road, the future extension of Tonkin Highway and the newly identified roads (Doley and Norman road extensions) required by the sub-regional framework; and</li> <li>+ Any other requirements that may be determined by the Shire of Serpentine Jarrahdale or State government agencies.</li> </ul> <p>Note: No subdivision proposals will be permitted pre-2050 unless they provide convincing rationale for and solutions to the above matters.</p>

Area	Key Considerations
DIA3 - South of Watkins Road / North of Stanley Road	<p>The purpose and intent of DIA3 is to explore the potential for a rural/urban interface area with consideration for innovative housing opportunities that respond to the landscape. A structure plan will be required which addresses the following matters:</p> <ul style="list-style-type: none"> <li>+ Investigate current zoning and land uses;</li> <li>+ Management of the transition of land uses;</li> <li>+ Carefully planning and management of drainage and the effect of development on the natural watercourse and surrounding land;</li> <li>+ Careful consideration and enhancement of the visual aspects and landscape protection of this attractive landscape area;</li> <li>+ Deliver land use and housing diversity and choice;</li> <li>+ Identify infrastructure and servicing requirements;</li> <li>+ Bushfire hazard management;</li> <li>+ Interface with Watkins Road, South Western Highway and the future extension of Tonkin Highway; and</li> <li>+ Any other requirements that may be determined by the Shire of Serpentine Jarrahdale or State government agencies.</li> </ul>

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# PART TWO

## EXPLANATORY SECTION







# 1.0 PLANNING BACKGROUND



# 1.1 Introduction and Purpose

## 1.1.1 INTRODUCTION

The original Mundijong Whitby District Structure Plan was prepared in 2011 to provide high-level strategic guidance on future planning and development in the Mundijong and Whitby localities. Since the preparation of this document, the Department of Planning, Lands and Heritage (DPLH) have released the final Perth and Peel@3.5 million strategic planning framework and the Shire has undergone a significant amount of change due to exponential population growth. The Perth and Peel@3.5 million strategic framework and associated South Metropolitan Sub-regional Planning Framework identified a number of significant planning initiatives and proposals in the region which have required consideration. In addition, the strategy also proposes that the Shire is projected to accommodate an additional 90,000 people (113,000 in total). SJ2050, the Shire’s high-level strategic vision explored how best to distribute this population, it was determined that approximately 50,000 people would call the Mundijong Urban Cell (Mundijong and Whitby localities) home. This would result in a population more than 20 times larger than the existing population in Mundijong.

The Shire has also progressed with the MRS amendment and development framework for the Mundijong Industrial Area to the west of the original district structure plan. This development framework is now sufficiently progressed to allow it to be incorporated into the Mundijong District Structure Plan and form an integrated residential/employment urban area.

The above has resulted in the need to revisit and update the Mundijong District Structure Plan to ensure it provides clear direction for the future planning and development of Mundijong and surrounds.

## 1.1.2 STRUCTURE PLAN PURPOSE

As illustrated on **Figure 3** the Mundijong District Structure Plan has been prepared to align with both the State government and Shire’s local planning frameworks, consolidating the numerous studies and investigations previously undertaken in the area. It has been prepared in collaboration with key stakeholders including relevant government agencies, major landholders and the community. As a broad district level planning instrument, its primary aim is to guide future planning and development in the Mundijong District Structure Plan area. This will include the broad disposition of land use, major roads, rail and other community infrastructure, district water management, and environmental protection for a population of 50,000 people. It is intended that the Mundijong District Structure Plan will form the general basis for subsequent preparation of LSPs on a precinct-basis as indicated in Part One.

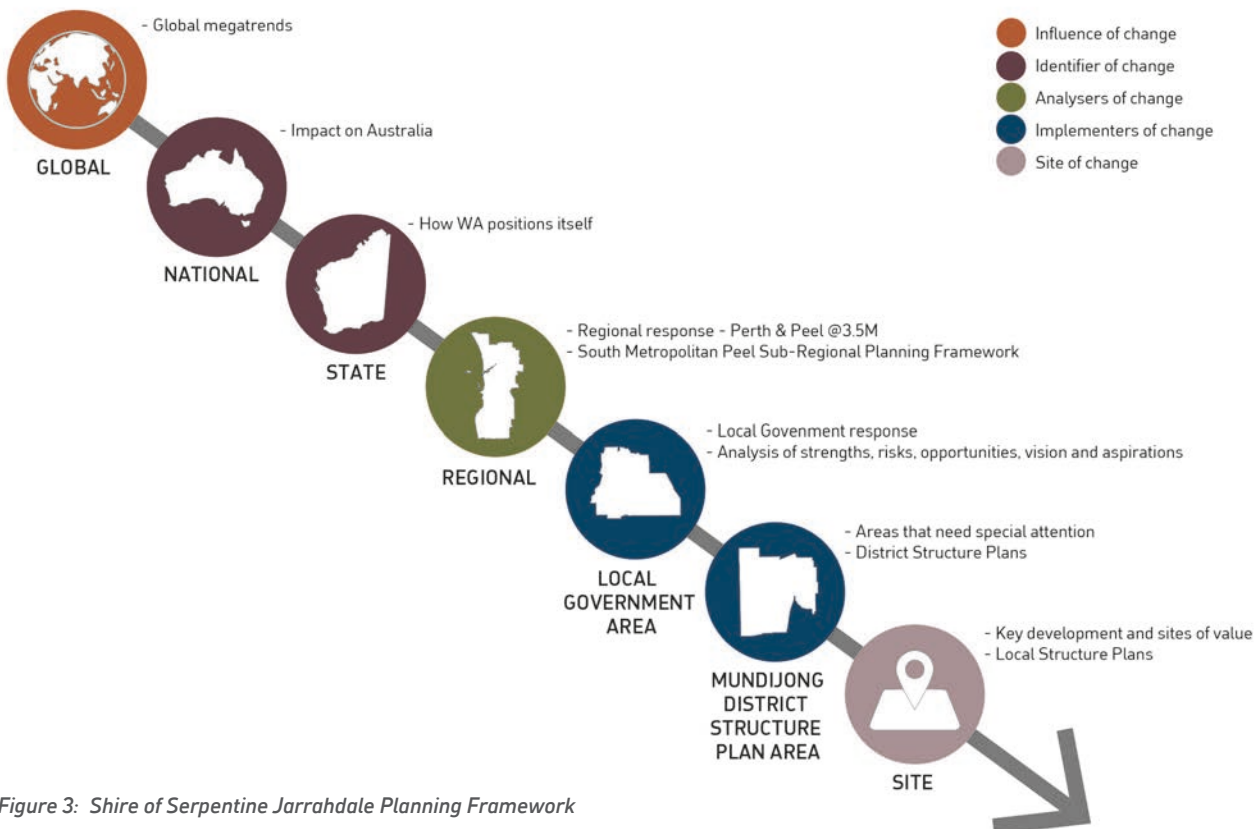


Figure 3: Shire of Serpentine Jarrahdale Planning Framework



### 1.1.3 VISION AND OBJECTIVES

The vision for the Mundijong District Structure Plan area has been framed by previous planning studies to accommodate future urban growth while maintaining the area's unique identity and lifestyle. This has been considered in concert with the outcomes of a comprehensive stakeholder engagement process undertaken as part of the preamble review of the existing Mundijong District Structure Plan, the culmination of which has been translated into a clear vision:

*"Mundijong will be a contemporary, connected place reflecting the community's rural character, 'green' values and vibrant village feel, building on the traditional town centre as the civic heart complemented by new sub-regional sports and recreational facilities to service the surrounding districts."*

This vision is further explored and expressed in a series of objectives, which identifies elements of importance to the community:

#### **A Thriving Community of choice**

- + To be a contemporary, connected place reflecting the community's rural character, 'green' values and village feel.
- + A new sub-regional hub of sporting and recreational facilities serving the community and surrounding district.
- + Create a vibrant and attractive place that offers a range of lifestyle choices and a liveable environment, supporting a safe, healthy and active community.

#### **Vibrant and Connected District Centres**

- + The traditional town centre of Mundijong is reinforced as the governance heart with its main street, train station and civic functions complementing the new Whitby town centre.
- + Create a strong local employment base which provides for locally available infrastructure and services.
- + Ensure as the Shire grows, strong governance will guide well designed growth that makes the most efficient use of existing and planned infrastructure and investment.

#### **A Distinct Sense of Place and Identifiable Character**

- + Create a distinctive and responsive built form that enhances the sense of place, community identity and character of Mundijong/Whitby.
- + A contemporary new District Centre that is well connected and reflective of the community's rural character, green values and vibrant village feel.

#### **A Safe Pedestrian and Interconnected Transit Hub**

- + Connecting many streets and pedestrian routes leading to a transit hub.
- + Reduce reliance on vehicles by creating a pedestrian-oriented community and providing for alternative transport modes.
- + Open space areas are provided with passive surveillance.
- + A street network and urban environment providing high levels of connectivity and legibility.

#### **A Place that Celebrates its Environmental Assets**

- + Preserve the existing rural, "leafy green" character of the structure plan area including its scenic values, views and landscapes.
- + Protect and enhance significant natural areas and their buffers, including those with ecological linkage values along railroads, roads and scenic highways.

#### **A Water Sensitive Place**

- + Maximise the efficient use and reuse of water by conserving water through efficiency and facilitating water reuse and fit-for-purpose use.
- + Protect and enhance wetlands, waterways and catchments through appropriate management of water quality and maintenance of hydrology as part of land use change and development.

#### **An Innovation Hub**

- + A local economy supported by the West Mundijong Industrial Precinct to encourage business expansion, job training and economic growth.
- + A regional magnet for a young and highly skilled workforce.
- + Reduce consumption of non-renewable resources via climate responsive design, efficient use of energy and water and increased use of renewable energy.

## 1.2 Land Description

### 1.2.1 LOCATION

The Mundijong District Structure Plan will apply to the area delineated on “**Figure 4: Mundijong District Structure Plan Area**” on page 34 which is the area approximately 8km north-south between Rowley Road and Gossage Road, and 15km east-west between the Darling Ranges foothills and Kargotich Road within the Shire of Serpentine Jarrahdale. The Mundijong District Structure Plan area includes the suburbs of Mundijong and Whitby, and parts of Cardup and Mardella.

### 1.2.2 AREA AND LAND USE

The Mundijong District Structure Plan covers an area of approximately 5,461 hectares. Land within the DSP area is predominantly rural and rural-residential land uses with small village centre and a newly established residential development in Whitby. Key area characteristics of the area can be summarised as follows:

- + Urban development is currently limited to the historical Mundijong Town Centre site which is located on Paterson Street, and in Whitby where new greenfield development is occurring;
- + The Shire of Serpentine Jarrahdale Administration Offices are located in the Mundijong Town Centre, they are collocated with a number of community uses to form a consolidated civic precinct;
- + The Mundijong Town Centre is surrounded by a rural hinterland which incorporates a number of agricultural uses; and
- + Key environmental features include the Mandejal Brook and Watkins Road Nature Reserve and a significant bush forever reserve in the north-east.

### 1.2.3 LEGAL DESCRIPTION AND OWNERSHIP

The Mundijong District Structure Plan applies to land under the jurisdiction of the Shire of Serpentine Jarrahdale. It includes a combination of State and local reserves, conservation areas and significant private landholdings (of varying sizes).



Figure 4: Mundijong District Structure Plan Area

Note: Not to scale

## 1.3 Planning Framework

### 1.3.1 ZONING AND RESERVATION

#### METROPOLITAN REGION SCHEME

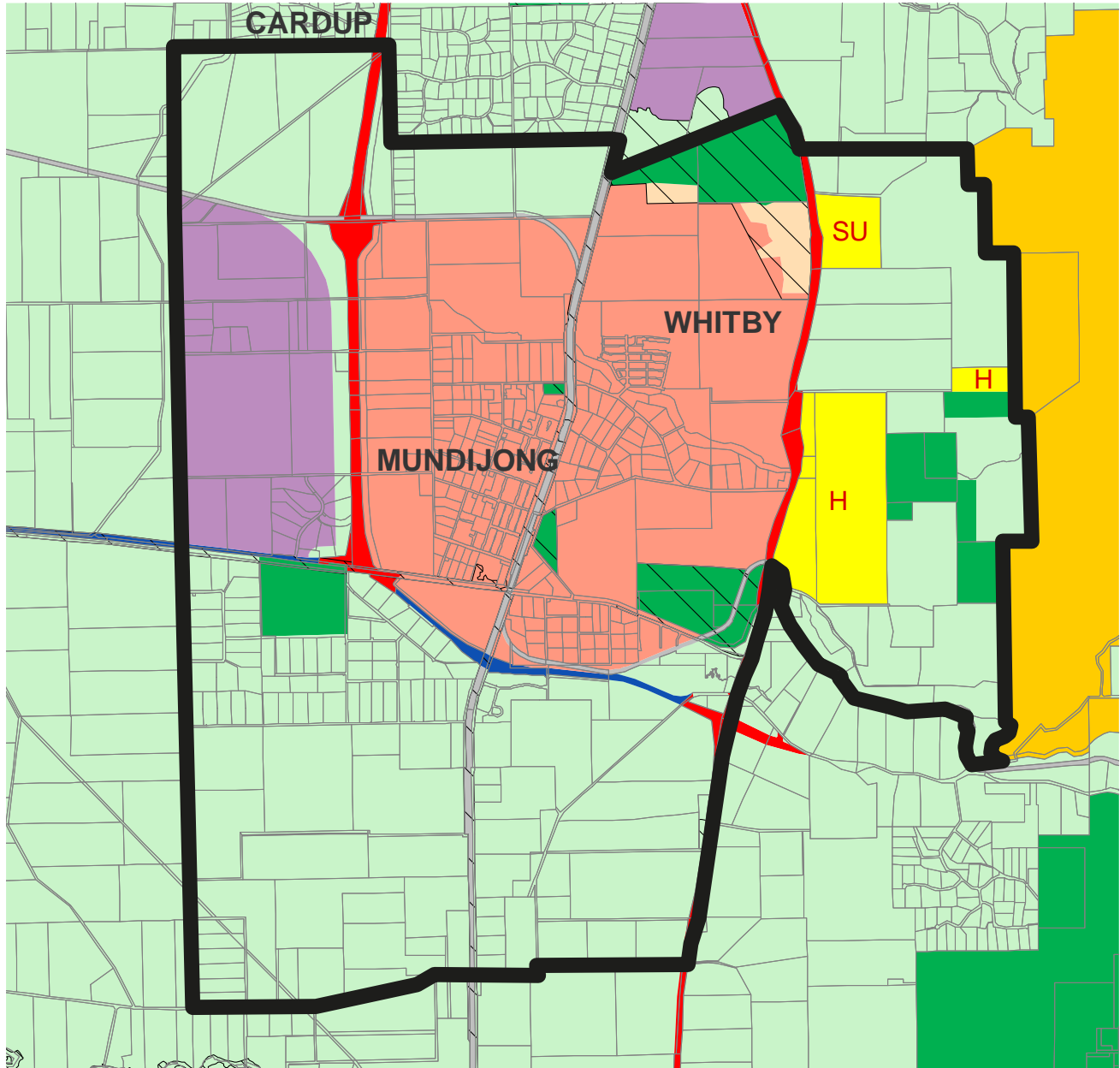
The Mundijong District Structure Plan area is subject to various zones and reservations under the Metropolitan Region Scheme (MRS) including 'Parks and Recreation', 'Railways', 'State Forests', 'Public Purpose', 'Primary Regional Roads', 'Urban', 'Urban Deferred', 'Industrial', 'Rural', 'Bush Forever Area'. A MRS zoning map depicting the layout of these zones and reservations within the Mundijong District Structure Plan area is provided at **Figure 5**.

#### LOCAL PLANNING SCHEME 3

Following Council's 2016 resolution to prepare a new Local Planning Strategy, the Shire have prepared draft Local Planning Scheme No. 3 (draft LPS 3) in accordance with the model provisions contained within Schedule 1 of the Local Planning Scheme Regulations. Draft LPS 3 seeks to rationalise the zoning and provisions contained within the existing TPS 2 and reflect the strategic objectives of the Draft Local Planning Strategy. At its December Meeting, Council resolved to advertise Draft LPS 3 and submit copies to the EPA for consent to advertise and the WAPC.

The local scheme zoning applicable to the Mundijong District Structure Plan area is illustrated on **Figure 6**. As draft LPS 3 will supersede TPS 2, the zones proposed in the Mundijong District Structure Plan align with the zonings proposed in draft LPS 3.

Figure 5: Metropolitan Region Scheme Map Extract



**Legend**

**Reserved lands**

- Parks and recreation
- Restricted public access
- Port installations
- Railways
- Civic and cultural
- State forests
- Waterways

**Reserved roads**

- Primary regional roads
- Other regional roads

**Public purpose reserves**

- Public purposes - denoted as follows:
- SEC** State Energy Commission
- WSD** Water Authority of WA

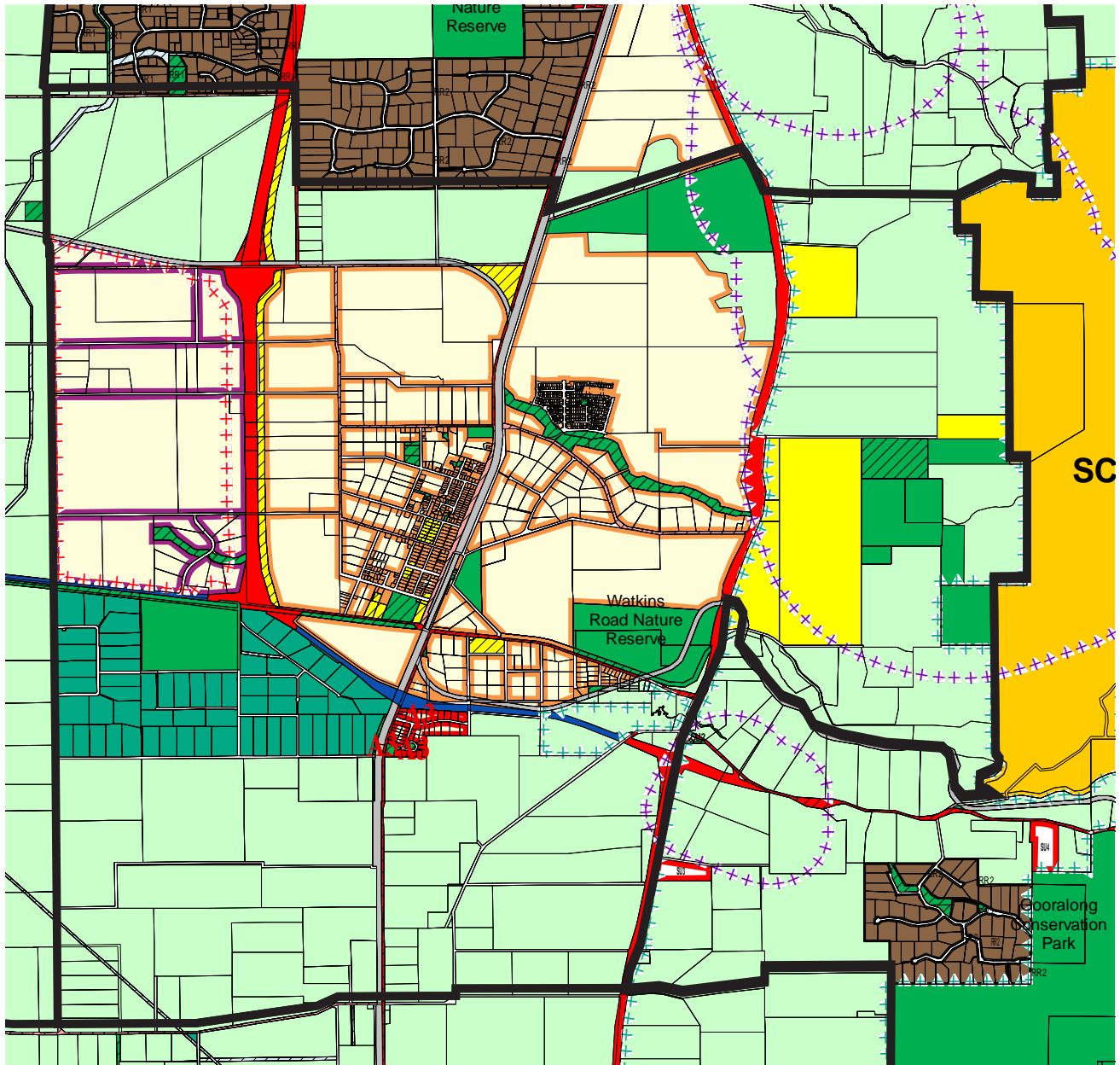
**Zones**

- Central city area
- Industrial
- Special industrial
- Private recreation
- Rural
- Rural - water protection
- Urban
- Urban deferred

**Notice of delegation**

- Bush forever area

Figure 6: Local Planning Scheme No.3



**LEGEND**

**REGION SCHEME RESERVES (MRS)**

- |                                   |   |
|-----------------------------------|---|
| Civic and Cultural                | Public Purposes                           |
| Other Regional Roads              | Public Purposes - Car Park                |
| Parks and Recreation              | Public Purposes - Commonwealth Government |
| Parks and Recreation - restricted | Public Purposes - High School             |
| Port Installations                | Public Purposes - Hospital                |
| Primary Regional Roads            | Public Purposes - Prison                  |
| Railways                          | Public Purposes - Special Uses            |
| State Forests                     | Public Purposes - State Energy Commission |
| Waterways                         | Public Purposes - Technical school        |
| Water Catchments                  | Public Purposes - University              |
|                                   | Public Purposes - Water Authority of WA   |

**LOCAL SCHEME RESERVES**

- (see scheme text for additional information)
- |                            |                          |
|----------------------------|--------------------------|
| Civic and Community        | Primary Distributor Road |
| Cultural Facilities        | Public Open Space        |
| Social Care Facilities     | Public Purposes          |
| District Distributor Road  | Cemetery                 |
| Drainage/Waterway          | Education                |
| Environmental Conservation | Government Services      |
| Local Distributor Road     | Infrastructure Services  |
| Local Road                 | Recreational             |
|                            | Railways                 |

**LOCAL SCHEME ZONES**

- (see scheme text for additional information)
- |                            |                     |
|----------------------------|---------------------|
| DC District Centre         | Rural Enterprise    |
| Environmental Conservation | Rural Residential   |
| Industrial Development     | Rural Smallholdings |
| Local Centre               | Rural Townsite      |
| Mixed Use                  | Service Commercial  |
| Residential                | Special Residential |
| Rural                      | Special Use         |
|                            | Urban Development   |

**OTHER CATEGORIES**

- (see scheme text for additional information)
- |   |                                     |
|---|-------------------------------------|
| Scheme Area Boundary                    | SCA4 Special Control Area - Develo  |
| Local Government Boundary               | SCA5 Special Control Area - Develo  |
| R20 R Codes                             | SCA6 Special Control Area - Develo  |
| A1 Additional Uses                      | SCA7 Special Control Area - Enviror |
| RRR1 Rural Residential Area             | SCA8 Special Control Area - Heritag |
| SU1 Special Use Area                    | SCA9 Special Control Area - Genera  |
| SCA1 Special Control Area - Heritage    | SCA10 Special Control Area - Genera |
| SCA2 Special Control Area - Environment |                                     |
| SCA3 Special Control Area - Environment |                                     |

## 1.3.2 STATE AND REGIONAL PLANNING FRAMEWORK

### STATE PLANNING STRATEGY 2050

The State Planning Strategy (SPS) is the lead strategic planning document within Government. It acts as a guide and highlights principles, strategic goals and strategic directions that are important to future land-use planning and development in WA. The Mundijong District Structure Plan aligns with the SPS by addressing the priorities of Strategic Goal 2 - Strong and Resilient Regions, Strategic Goal 3 - Sustainable Communities, Strategic Goal 4 - Infrastructure Planning and Coordination, and Strategic Goal 5 - Conservation. These include:

#### Diversity

- + Embracing diverse economic and social opportunities;
- + Community-specific development, responsive to diverse needs, places and contexts;
- + Supporting economic diversity, innovation and resilience;
- + Understanding, maintaining and conserving biodiversity, landscapes and natural environments.

#### Liveability

- + Creating places where people want to live and work;
- + Communities with attractive, liveable environments;
- + Providing contemporary, effective, resource-efficient services;
- + Securing our natural environments and resources.

#### Connectedness

- + Building strong relationships and accessibility;
- + Providing natural and built connections within and between communities;
- + Linking regional economic opportunities to the movement of people, goods and services across the State;
- + Connecting ecosystems, people and natural resources.

#### Collaboration

- + Enabling collaborative advantages across and within regions;
- + Collaborative and inclusive planning;
- + Sharing new ideas and creating new business and lifestyle opportunities;
- + Realising opportunities through collaboration for environmental conservation and sustainable resource use.

### PERTH AND PEEL @3.5 MILLION / SOUTH METROPOLITAN PEEL SUB REGIONAL PLANNING FRAMEWORK

The Perth and Peel@3.5 million suite of strategic land use planning documents provide a framework for future growth in the Perth and Peel regions. The strategy recognises the benefits of a consolidated and connected city, utilising the region's previous historic patterns of urban growth. This strategy promotes more efficient use of land and infrastructure, and maintains a target of 47% of new lots by infill. It is divided into four sub-regional frameworks, which provide more detailed guidance on future land use and development for a city of 3.5 million people. The frameworks provide for different lifestyle choices, vibrant nodes for economic and social activity and a more sustainable urban transport network.

The Shire of Serpentine Jarrahdale is guided by the South Metropolitan Peel Sub-Regional Framework (**Figure 7**). The framework outlines that the Shire has an Urban Infill Dwelling target of 1,365 and a population target of 113,058 by the year 2050. The Mundijong District Structure Plan has been identified as a district centre within the framework. This gives the opportunity for the area to expand to help achieve these growth targets in a sustainable and coordinated manner. A significant number of the modifications that have been made to the Mundijong-Whitby DSP to get to the Mundijong District Structure Plan have resulted from this State framework.

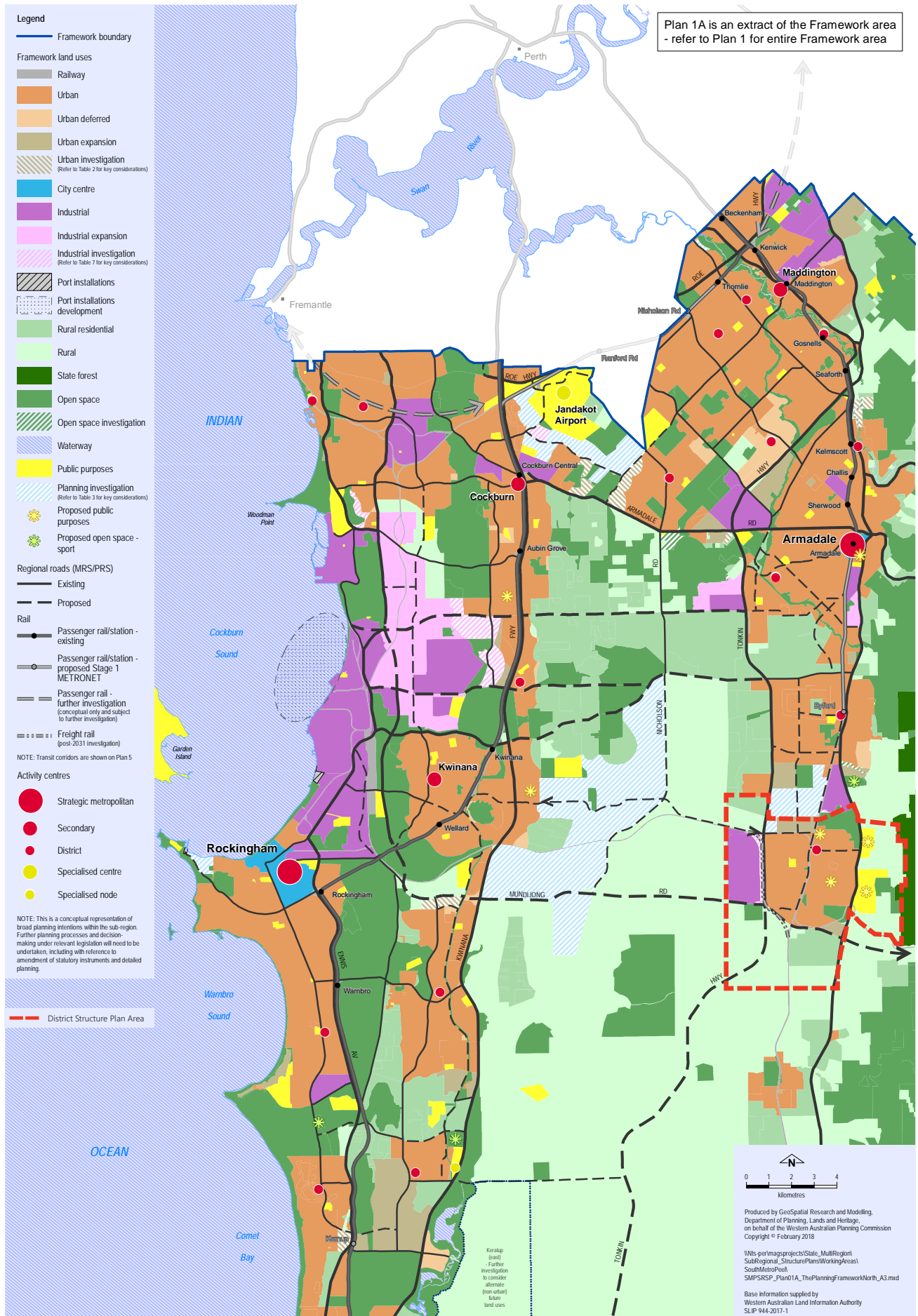


Figure 7: South Metropolitan Peel Sub-Regional Planning Framework

## EPA GUIDELINES

The Environmental Protection Authority (EPA) Guidelines fall under the provisions of the Environmental Protection Act 1986 and help guide the Shire in how to undertake assessments of applications. The Mundijong District Structure Plan has been prepared taking into consideration the following applicable EPA guidelines:

- + EPB 20 – Protection of Naturally Vegetated Areas Through Planning and Development
- + GS 3 – Separation Distances Between Industrial and Sensitive Land Uses
- + GS 33 – Environmental Guidance for Planning and Development

## STATE PLANNING POLICIES (SPP)

### **SPP 2.1 Peel Harvey Coastal Plain Catchment**

This Policy applies to all residential, commercial, industrial, rural and recreation land uses, and public sector undertakings within that portion of the Catchment of the Peel-Harvey Estuarine System that lies on the Swan Coastal Plain of Western Australia and within which part of the Shire is situated. The objectives of the policy are to improve the social, economic, ecological, aesthetic, and recreational potential of the Peel-Harvey Coastal Plain Catchment, ensuring that changes to land uses within it are controlled so as to avoid and minimise environmental damage to the Peel-Harvey Estuarine system.

The policy area includes the Mundijong District Structure Plan area west of the Darling Scarp. When considering proposed development, including subdivision, the Shire must take into account land capability and suitability and specific management practices (such as effluent treatment, red mud amendment, revegetation, and stocking rates). Land used for intensive agriculture that is likely to drain towards the Peel-Harvey Estuarine System must be managed to reduce or eliminate nutrient export from the land. The retention and rehabilitation of existing remnant vegetation is also encouraged.

### **SPP 2.4 Basic Raw Materials**

SPP 2.4 Basic Raw Materials sets out the matters which are to be taken into account and given effect to by the Local Government and WAPC in considering zoning, subdivision and development applications for extractive industries. The key objectives of the policy are as follows:

- + Identify the location and extent of known basic raw material resources;
- + protect priority resource locations, key extraction areas and extraction areas from being developed for incompatible land uses which could limit future exploitation;
- + ensure that the use and development of land for the extraction of basic raw materials does not adversely affect the environment or amenity in the locality of the operation during or after extraction; and
- + provide a consistent planning approval process for extractive industry proposals including the early consideration of sequential land uses.

### **SPP 2.5 Rural Planning**

SPP 2.5 Rural Planning seeks to protect and preserve Western Australia's rural land assets due to the importance of their economic, natural resource, food production, environmental and landscape values. Ensuring broad compatibility between land uses is essential to delivering this outcome. The Mundijong District Structure Plan contains numerous lots which are currently zoned Rural. Provisions to retain many of these rural lots have been implemented in the Mundijong District Structure Plan to be consistent with the policy.

### **SPP 2.8 Bushland Policy for the Perth Metropolitan Region**

SPP 2.8 Bushland Policy for the Perth Metropolitan Region aims to ensure the bushland protection and management issues in the Perth Metropolitan Region are appropriately addressed and integrated with broader land use planning and decision making. Some significant areas are classed as Bush Forever, State Forest or native vegetation within the Mundijong District Structure Plan. Due to this, consideration has been given to the impact development within the Mundijong District Structure Plan may have on these bushland areas, especially Bush Forever sites. More detailed negotiation on any areas to be retained or removed will occur during the rezoning and local structure planning stages.



### **SPP 3 Urban Growth and Settlement**

SPP 3 Urban Growth and Settlement sets out the principles and considerations which apply to planning for urban growth and settlement in Western Australia. The Mundijong District Structure Plan has given consideration to key objectives outlined in this policy including;

- + Creating sustainable communities;
- + Managing urban growth and settlements across Western Australia;
- + Managing urban growth in Metropolitan Perth;
- + Planning for liveable neighbourhoods;
- + Coordination of services and infrastructure; and
- + Managing rural residential growth.

### **SPP 3.1 Residential Design Codes**

SPP 3.1 Residential Design Codes (R-Codes) seeks to control the design of most residential development throughout Western Australia. The R-Codes aim to address emerging design trends, promote sustainability, improve clarity and highlight assessment pathways to facilitate better outcomes for residents. The Codes are also used for the assessment of residential subdivision proposals. Whilst the R-Codes will be suitable for certain types of development within the Mundijong District Structure Plan area, there may be other locations that will require the preparation of Local Development Plans in order to vary requirements to suit local constraints for residential development.

### **SPP 3.4 Natural Hazards and Disasters**

SPP 3.4 Natural Hazards and Disasters aims to mitigate the adverse effects of natural hazards and disasters. There are two main hazards which the Mundijong District Structure Plan needs to address to respond to this policy; Floods and Bushfires. Flood risk needs to be assessed due to there being some rivers and streams running through the Mundijong District Structure Plan. Local structure plans should, where necessary, be accompanied with a flood risk assessment report. Bush fires are also a significant hazard for the area as it is situated on the rural fringe with large amounts of bush land surrounding it. Local structure plans will need to be accompanied with bush fire risk assessments for all new development within the Mundijong District Structure Plan.

### **SPP 3.5 Historic Heritage Conservation**

SPP 3.5 Historic Heritage Conservation sets out the principles for the conservation and protection of Western Australia's historic heritage. There are a number of heritage listed places within the Mundijong District Structure Plan which are planned to be maintained, upgraded or re-purposed to enable continued use of the heritage places within the Mundijong District Structure Plan. The areas around these heritage places are to be developed in a way that does not adversely affect the significance of the heritage place. These are to be detailed as part of any proposed LSP.

### **SPP 3.6 Development Contributions for Infrastructure**

SPP 3.6 Developer Contributions for Infrastructure aims to help guide local governments in setting up a cost sharing arrangement between developers/landowners through the use of Developer Contribution Plans. Development Contribution Plans are used for an appropriate cost sharing arrangement between developers towards common community and traditional infrastructure within the Mundijong District Structure Plan. These include but are not limited to; upgrading of roads that are considered to facilitate a district function from the expected increased population, raising the rail line currently running through the centre of town so it is no longer an at-grade crossing, as well as multi-purpose community club rooms and recreation facilities, including the provision of district open space.

### **SPP 3.7 Planning in Bushfire Prone Areas**

SPP 3.7 Planning in Bushfire Prone Areas intends to implement effective, risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure. Under the bushfire guidelines the Mundijong District Structure Plan is considered a strategic planning proposal, therefore a high level bushfire hazard level assessment ought to be undertaken. More detailed bushfire attack level (BAL) assessments will need to be conducted for future subdivisions and development applications.

**SPP 4.1 State Industrial Buffer Policy**

The objectives of SPP 4.1 are:

- + To provide a consistent state-wide approach for the definition and securing of buffer areas around industry, infrastructure and some special uses.
- + To protect industry, infrastructure and special uses from the encroachment of incompatible land uses.
- + To provide for the safety and amenity of land uses surrounding industry, infrastructure and special uses.
- + To recognise the interests of existing landowners within buffer areas who may be affected by residual emissions and risks, as well as the interests, needs and economic benefits of existing industry and infrastructure which may be affected by encroaching incompatible land uses.

The policy is applicable to the Mundijong District Structure Plan area due to the integration of the Mundijong Industrial Precinct. Future development of the industrial precinct will need to address buffer zones to protect future urban development.

**SPP 4.2 Activity Centres for Perth and Peel**

SPP 4.2 Activity Centres for Perth and Peel identifies the broad requirements for the planning and development of new and renewal of existing activity centres in the Perth and Peel regions. A primary objective of the policy is to increase the diversity and density of housing within and around activity centres to help improve land use efficiency, residential amenity, access to services, housing variety and centre vitality.

The Mundijong District Structure Plan contains a district level activity centre (Whitby Town Centre) and a number of neighbourhood centres. The Whitby Town Centre is expected to service a catchment of approximately 50,000 people. Through appropriate land use planning and transport integration the Mundijong District Structure Plan must enable the Mundijong District Structure Plan area to provide a range of employment opportunities, access to retail and entertainment, housing diversity, and sufficient access to public transport. This policy may require that Activity Centre Plans be drafted for the Whitby Activity Centre and Mundijong Civic Precincts.

**SPP 5.4 Road and Rail Transport Noise and Freight Consideration in Land Use Planning**

SPP 5.4 seeks to promote a system where sustainable land use and transport are mutually compatible. Specifically it sets out how amenity impacts such as transport noise, associated with high volume roads, rail lines and freight routes should be addressed through the planning system.

The objectives of this policy are to:

- + protect people from unreasonable levels of transport noise by establishing a standardised set of criteria to be used in the assessment of proposals;
- + protect major transport corridors and freight operations from incompatible urban encroachment;
- + encourage best-practice design and construction standards for new development proposals and new or redeveloped transport infrastructure proposals;
- + facilitate the development and operation of an efficient freight network; and
- + facilitate the strategic co-location of freight handling facilities.

The policy is applicable to the Mundijong District Structure Plan area due to the presence of SW Highway which is a primary freight road and the SW freight rail which traverses through the centre of the town site.

Typically the Shire's approach is to treat noise impacts at the source, therefore all development applications will be assessed for their potential impact on existing uses.

### **SPP 7 Design of the Built Environment (Draft) (2016)**

Western Australia's SPP 7: Design of the Built Environment addresses the design quality of the built environment across all planning and development types, to deliver broad economic, environmental, social and cultural benefit. It also seeks to improve the consistency and rigour of design review and assessment processes across the State. The policy sets out the principles, processes and considerations which apply to the design of the built environment in Western Australia. It provides the overarching framework for those State Planning Policies that deal with design related issues, to be used in conjunction on specific development types relating to the design matters of a proposal.

As the Mundijong and Whitby Town Centres evolve, becoming an increasingly multifunctional mixed use environment, new development will need to respond to this policy to address the design quality of both the built environment and its public realm.

## **DEVELOPMENT CONTROL POLICIES**

### **Development Control Policy 2.3 - Public Open Space in Residential Areas**

This policy is to ensure that the provision of public open space allows for a reasonable distribution of land for active and passive recreation in each locality. This policy sets out the WAPC objectives for public open space and the provision of land for community facilities in residential areas as follows:

- + Ensure that all residential development is complemented by adequate, well-located areas of public open space that will enhance the amenity of the development and provide for the recreational needs of local residents.
- + Protect and conserve the margins of wetlands, water-courses and the foreshores adjacent to residential development.

The Mundijong District Structure Plan is growing and is therefore likely to undergo significant residential development requiring public open space. Future planning and subdivision will need to have consideration for the policy measures in Development Control Policy 2.3. As the Mundijong District Structure Plan is a district level document, some of the policy measures do not specifically apply to the Mundijong District Structure Plan map.

### **Development Control Policy 2.4 - School Sites**

This policy contains the WAPC's general requirements for school and TAFE college sites in residential areas and recognises the need to consider any requirements for higher education facilities. It should be used during the preparation of designs for the subdivision of residential land at both the structure planning (district and local structure planning) and subdivision design stages. The objectives of the policy are to:

- + To make provision for school sites and other education facilities related to community needs.
- + To indicate school site requirements, specify criteria for selecting new sites, and
- + To establish guidelines for their design and location in new subdivisions.

The Mundijong District Structure Plan is an emerging area therefore a range of education facilities will be required to help provide equitable access to education for Shire residents. The provisions of this policy will inform preparation of the Mundijong District Structure Plan map which will identify the location for new education facilities in accordance with the following standards:

- + Primary Schools - one site for between 1,500 and 1,800 housing units for government schools;
- + Secondary Schools - one site for every four or five primary schools for government schools. While the basis for providing non-government schools will be different from government schools, their provision at the average ratio of one non-government to three government primary schools and one to two for secondary schools may be an appropriate basis for planning; and
- + For technical colleges there is a general correlation between population and the need for college sites. The general requirement is one site for every 60,000 to 70,000 population.

### **Development Control Policy 3.4 - Subdivision of Rural land**

This policy sets out the principles that will be used by the WAPC in determining applications for the subdivision of rural land. The policy is consistent with the objectives of State Planning Policy 2.5: Rural Planning, which establishes the state wide policy framework for rural land use planning in Western Australia. The Mundijong District Structure Plan contains a significant portion of rural land, whilst certain portions have been allocated for urban development the remainder will need to be protected and have consideration for the following objectives:

- + Support existing, expanded and future primary production through the protection of rural land, particularly priority agricultural land and land required for animal premises and/or the production of food;
- + Provide investment security for existing, expanded and future primary production, and promote economic growth and regional development on rural land for rural land uses;
- + Outside of the Perth and Peel planning regions, secure significant basic raw material resources and provide for their extraction;
- + Provide a planning framework that comprehensively considers rural land and land uses, and facilitates consistent and timely decision-making;
- + Avoid and minimise land use conflicts;
- + Promote sustainable settlement in, and adjacent to, existing urban areas; and
- + Protect and sustainably manage environmental, landscape and water resource assets.

### **Development Policy 4.1 - Industrial Subdivision**

This policy provides guidance on the matters considered by the WAPC when determining applications for industrial subdivision throughout the state. The primary industrial areas proposed in the Mundijong District Structure Plan is in West-Mundijong, this area will include industrial subdivision and should therefore:

- + Encourage the development of well-designed industrial areas serving the full range of general and special industrial needs throughout the State;
- + Provide for the safe and efficient movement of traffic to and from each site within the industrial area;
- + Provide for infrastructure services and public open space consistent with the operational needs of industrial users and the workforce; and
- + Protect the amenity of adjacent land uses, where necessary, from the effects of industrial development.

### **Draft Government Sewerage Policy**

The Draft Government Sewerage Policy 2016 promotes reticulated sewerage as the best disposal method for sewerage. It requires all new subdivision and development to be connected to reticulated sewerage where available or considered necessary on health, environment or planning grounds. The Mundijong District Structure Plan has been prepared taking into account the requirements of the draft Policy, particularly the stated exemptions to the requirement to connect to reticulated sewerage which may have relevance in some instances.

### **Liveable Neighbourhoods**

Liveable Neighbourhoods is a Western Australian Planning Commission (WAPC, 2015) operational policy that guides the structure planning and subdivision for greenfield and large brownfield (urban infill) sites. Liveable Neighbourhoods is an integral component of the state planning framework, delivering the objectives of the Perth and Peel@3.5million sub-regional frameworks and future sub-regional structure plans. It plays a key role within the state planning framework and in relation to the local planning framework including local planning strategies, local planning schemes and policies. The Mundijong District Structure Plan must meet the criteria of the Liveable Neighbourhoods unless there is an approved local planning policy that varies some of the provisions.

### 1.3.3 LOCAL PLANNING FRAMEWORK

#### SJ 2050 VISION

The Serpentine Jarrahdale 2050 Vision (SJ2050) process commenced in April 2016, in response to the draft 'Perth and Peel@3.5 million' strategic plan released by the State Government in 2015. As mentioned above, the strategy estimated a population increase of approximately 100,000 in the Shire by 2050. SJ2050 was developed through

extensive consultation and engagement with the local community and key stakeholders. The document identifies the core values and guiding aspirations of the Shire's community. SJ 2050 sets out a strategic growth framework that aims to accommodate rapid growth, without compromising the community's values and aspirations.

The SJ2050 spatial framework "**Figure 8: SJ 2050 Spatial Framework**" on page 46 identifies that the Mundijong will accommodate approximately 50,000 people, this significant growth resulted in the need to review and update the existing Mundijong District Structure Plan.

#### SHIRE OF SERPENTINE JARRAHDALE RURAL STRATEGY REVIEW (2013)

The Shire of Serpentine Jarrahdale Rural Strategy (2013) is a strategic document that seeks to preserve and enhance the Shire's rural character and its role as an important economic contributor to the Shire and broader region. The Strategy has been developed based on the following key themes:

- + Protection of Natural Assets;
- + Protection of Rural Character; and
- + Facilitate Productive Rural Areas.

The Rural Strategy excludes urban and industrial areas within the Mundijong District Structure Plan, it therefore only applies to rural and rural- residential areas located on the fringe of the Shire's area.

#### SHIRE OF SERPENTINE JARRAHDALE DRAFT LOCAL PLANNING STRATEGY

The Shire of Serpentine Jarrahdale Draft Local Planning Strategy sets out long term planning direction and provides the rationale for the zones and other provisions of the draft Shire of Serpentine Jarrahdale Local Planning Scheme No.3. The Local Planning Strategy outlines the general aims and intentions for future long-term growth and change within the Shire of Serpentine Jarrahdale. A key component of the Strategy is the Strategic Plan, which includes land use categories that have been guided by the overall vision, principles and objectives of the Strategy.

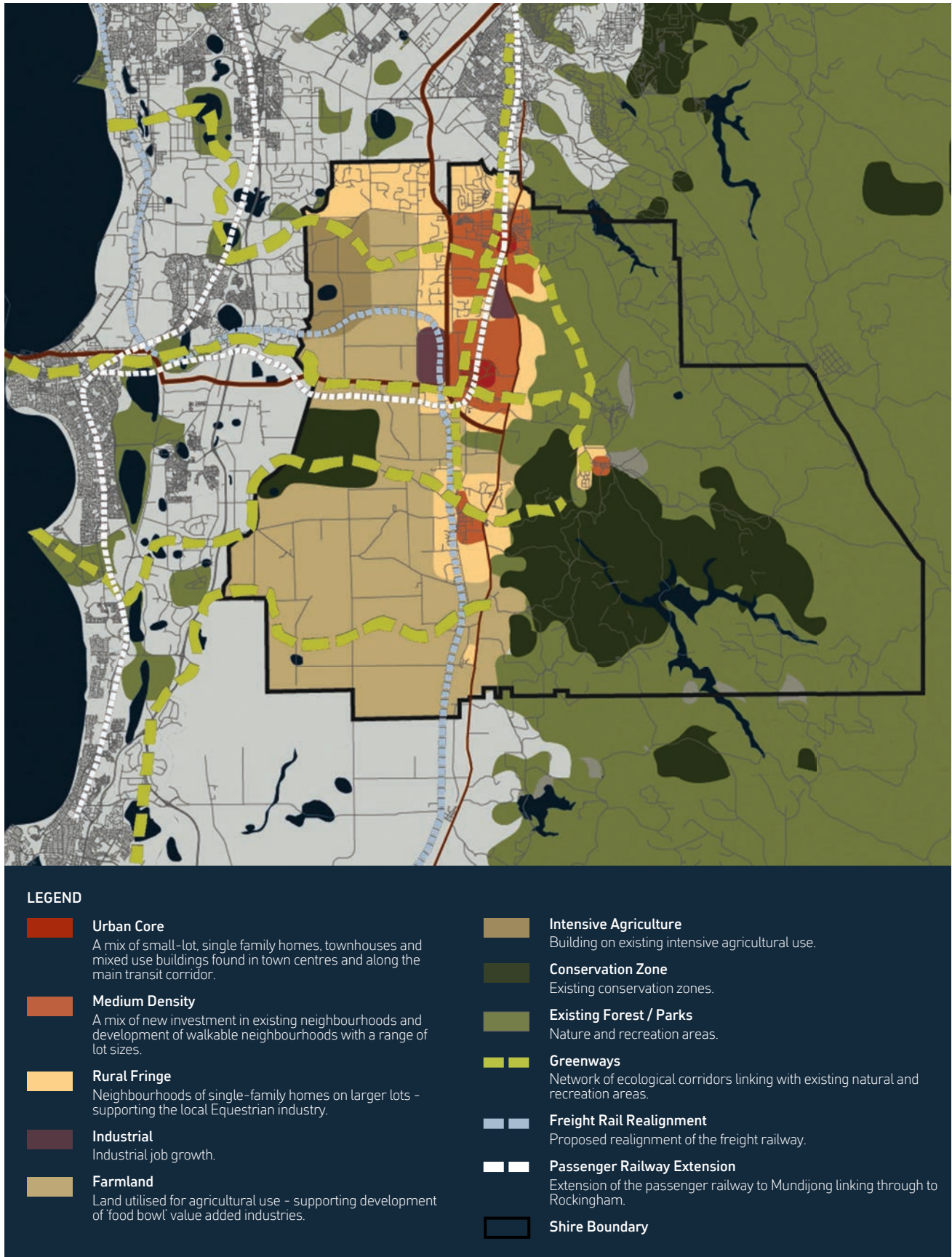
The draft Local Planning Strategy aligns with SJ2050 by planning for a future Byford population of 50,000 people, to facilitate this growth the following objectives were developed (and have been considered in preparing the Mundijong District Structure Plan):

- + Achieve a diversity of housing types to provide choice, adaptability and to accommodate a range of incomes, households and life stages and to deliver housing product which will attract people to live in Mundijong Whitby;
- + Achieve distinctive urban precincts within Mundijong Whitby;
- + Integrate new housing and urban development with the older urban development patterns and housing as well as natural areas in a sensitive manner; and
- + Encourage urban development and housing to be environmentally sustainable and resource efficient.

These objectives are supported by a number of strategies and actions, some of which include:

- + Review the Mundijong District Structure Plan; and
- + Create a development contribution scheme and plan for Mundijong.

Figure 8: SJ 2050 Spatial Framework



## DEVELOPMENT CONTRIBUTION PLANS

Two Development Contribution Arrangements (DCA) apply to the Mundijong District Structure Plan area, being West Mundijong Development Contribution Plan (DCA2) and the proposed Mundijong Development Contribution Plan (DCA3). These have been prepared to set out the infrastructure, land and other items for which development contributions are to be collected, as well as cost estimates, how land values are to be calculated and the methodology that will be used to calculate contributions for traditional infrastructure relating to land and infrastructure towards district roads, public open space and drainage.

A community infrastructure DCA will also apply to DCA3 for the Mundijong urban precinct. The plan seeks collect contributions towards common community facilities, including sporting club rooms, recreation facilities and multi-purpose buildings.

## MUNDIJONG WHITBY DISTRICT STRUCTURE PLAN

The original Mundijong Whitby District Structure Plan was approved in 2011 and sought to guide development and subdivision of the Mundijong Whitby District Structure Plan area, setting the foundation for the initial growth and expansion of the townsite and surrounds. The Mundijong District Structure Plan reflects and builds upon the key objectives and principles of the original District Structure Plan in order to consolidate the work undertaken to date and to sustainably guide the future growth of Mundijong.

## LOCAL PLANNING POLICIES

In addition to the above, the Shire of Serpentine Jarrahdale administers a number of Local Planning Policies that have been taken into consideration in the preparation of the Mundijong District Structure Plan (**Table 3**). These include:

*Table 3: Shire Local Planning Policies*

OPERATIONAL	STATUS
+ LPP 1.1 - Development Assessment Unit	Approved
+ LPP 1.2 - Development Applications Information	Approved
+ LPP 1.3 - Amendments and Extensions to Existing Approvals	Approved
+ LPP 1.4 - Public Consultation for Planning Matters	Approved
+ LPP 1.5 - Other Exempt Developments	Approved
+ LPP 1.6 - Public Art for Major Developments	Approved
+ LPP 1.7 - Road Naming	Approved
+ LPP 1.8 - Cash-in-lieu for Parking	Approved
+ LPP 1.9 - Bonds and Bank Guarantees	Approved
+ LPP 24 - Designing Out Crime	Approved
+ LPP 40 - Local Development Plans	Approved
PLANNING FRAMEWORKS	STATUS
+ LPP 2.1 - Structure Plan and Subdivision Standards	Draft
+ LPP 2.2 - Local Development Plan Guidelines	Draft
+ LPP 2.3 - Development Standards for Development Applications	Approved
+ LPP 2.4 - Water Sensitive Design	Approved
+ LPP 2.5 - Activity Centres	Approved
+ LPP 2.6 - Stanley Road Precinct Planning Framework	Approved
+ LPP 2.7 - Biodiversity Planning	Approved
+ LPP 2.8 - Public Open Space	Approved
+ LPP 3.5 - Byford Town Centre Public Realm Guidelines	Approved
+ LPP 3.6 - The Glades Village Centre Guidelines	Approved
+ LPP 3.7 - George Street Design Guidelines	Approved
+ LPP 3.8 - Byford Town Centre Built Form Guidelines	Approved
+ LPP 51 - Oakford Rural Economic Living Area Planning Framework	Approved

DESIGN GUIDELINES	STATUS
+ LPP 3.1 - McNeil Grove Design Guidelines	Approved
+ LPP 3.2 - Woodlot Subdivision Jarrahdale Design Guidelines	Approved
+ LPP 3.3 - Wellard and Richardson Street Serpentine Design Guidelines	Approved
LAND USE	STATUS
+ LPP 4.1 - Ancillary Dwelling	Approved
+ LPP 4.2 - Sea Containers	Approved
+ LPP 4.3 - Landscape Protection	Approved
+ LPP 4.4 - Dams and Lakes	Approved
+ LPP 4.5 - Temporary Accommodation	Approved
+ LPP 4.6 - Telecommunications Infrastructure	Approved
+ LPP 4.7 - Placement of Fill in Non-Urban Areas	Approved
+ LPP 4.8 - Land Sales Offices	Approved
+ LPP 4.9 - Fast Food Premises	Approved
+ LPP 4.10 - Extractive Industries	Approved
+ LPP 4.11 - Advertising	Approved
+ LPP 4.12 - Horticulture	Approved
+ LPP 4.13 - Revegetation	Approved
+ LPP 4.14 - Rural Worker's Dwellings	Approved
+ LPP 4.15 - Bicycle Facilities	Approved
+ LPP 4.16 - Landscape and Vegetation	Approved
+ LPP 4.17 - Multiple Use Trails	Approved
+ LPP 4.18 - Street Trees	Approved

The above policies do not conflict with the Mundijong District Structure Plan, however, they will require consideration in more detailed design and implementation planning processes to follow.

### 1.3.4 PRE-LODGE MENT CONSULTATION

Significant community and stakeholder engagement was undertaken to inform development of concept options and subsequently the development of the Mundijong District Structure Plan. Key stakeholders are defined as those with significant holdings or influence in the way that the Mundijong District Structure Plan area will develop.

In addition, there was a significant Shire-wide engagement process undertaken online which included nine individual surveys. The surveys were divided into specific themes to provide targeted engagement. These included themes which have informed the Mundijong District Structure Plan such as community facilities, transport, sport and recreation, environment, employment, and education and training.

A summary of community and stakeholder engagement is provided in **Table 4**.



Table 4: Pre-Lodgement Engagement Summary

AGENCY / GROUP	DATE	CONSULTED BY	METHOD OF ENGAGEMENT	SUMMARY OF OUTCOME
Shire of Serpentine Jarrahdale Internal Stakeholders - Local Development Strategy Champions	16/11/17 22/03/18	Hames Sharley	Workshops Emails	Input into concept plan and District Structure Plan
Shire Councillor's	4/12/2017 + 4/4/2018	Hames Sharley	Workshops	Input into concept plan
Woolworths	30/01/18	Shire Project Team Hames Sharley	Meeting	Input into concept plan
Public Transport Authority and METRONET	1/02/18 - Ongoing	Shire Project Team Hames Sharley	Meetings Emails	Input into Transport Assessment and concept plan
Department of Planning Lands & Heritage and Public Transport Authority	1/02/18 - Ongoing	Shire Project Team Hames Sharley	Meetings Phone / Emails	Input into Transport Assessment, District Structure Plan and Development Contribution Plan
West Mundijong Industrial Reference Group	7/02/18	Shire Project Team Hames Sharley SPP Consulting	Meetings	Input into Development Contribution Plan
Mundijong Industrial Reference Group	7/02/18	Shire Project Team Hames Sharley SPP Consulting	Meetings	Input into Development Contribution Plan
Golden Group	15/02/18	Shire Project Team Hames Sharley	Meeting Emails	Input into concept plan
Mundijong Community Workshop	17/02/18	Hames Sharley	Workshops	Input into concept plan
Coles	20/02/18	Shire Project Team Hames Sharley	Meeting	Input into concept plan
Mainroads WA	20/02/18	Shire Project Team Hames Sharley	Meetings Emails	Input into Transport Assessment
QUBE Property	21/02/18	Shire Project Team Hames Sharley	Meeting	Input into concept plan
LWP Property	21/02/18	Shire Project Team Hames Sharley	Meeting	Input into concept plan
PEET	2/03/18	Shire Project Team Hames Sharley	Meeting	Input into concept plan
Department of Water and Environmental Regulation	8/03/18	Shire Project Team Hames Sharley	Meeting Emails	Input into District Structure Plan
Department of Education	9/03/18	Shire Project Team Hames Sharley	Meeting Emails	Input into concept plan and District Structure Plan

Outcomes of the Mundijong community and stakeholder engagement process identified above are further summarised in Technical Appendix 1.



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# 2.0 CONTEXT ANALYSIS



## 2.1 Regional Context

The Mundijong District Structure Plan area forms the southern most urban area in the South Eastern corridor of the Perth Metropolitan Region, 40 km south-east of the Perth CBD (**Figure 9**).

While at the southern end of the South East metropolitan corridor, Mundijong/Whitby is geographically centrally located within the Shire of Serpentine Jarrahdale. The subject area is well connected to Perth (via Armadale) and Bunbury via the South Western Highway and again to Perth via Mundijong Road and the Kwinana Freeway. The Mundijong District Structure Plan area is also well connected to the Rockingham, Cockburn and Kwinana industrial areas to the west, via Mundijong Road.

The subject area is dissected by a major freight line. This freight line services the Alcoa and Boddington mining areas and connects to the Kwinana Strategic Industrial area and ultimately port facilities on the coast. Significant freight movements occur on a daily basis. Current land uses to the north, west and south are generally dominated by rural and/or associated agricultural pursuits. The Darling Scarp and State Forest to the east provide an alternative landscape background to the subject area and offer potential for tourism and alternative lifestyle experiences.

A number of major strategic initiatives are already planned or being contemplated which further influences the regional context within which the Mundijong District Structure Plan must be considered.

The reservation of land immediately adjoining the subject area to the west for the purpose of extending the Tonkin Highway to the South Western Highway will place Mundijong at the junction of major regional highways. This will significantly improve regional transport links and more efficiently connect Mundijong/Whitby to the rest of the metropolitan area.

Figure 9: Regional Context



## 2.2 Local Context

### 2.2.1 LAND USE

Historically, the Mundijong District Structure Plan area has performed a dual role as the civic and governance heart of the Shire, and service centre for an extensive agricultural hinterland. Urban development has been limited to the Mundijong town centre and surrounds. However, growth pressures associated with population growth will change the existing landscape.

The town centre is located 2 km west of South Western Highway and is focussed on the western side of the railway line on Paterson Street. The suburban scale and form of development extends to the main street and the stores and services are generally isolated developments with no unifying built form or contiguous verandahs. The extensive reserve along the eastern side of Paterson Street, bordering the railway line, is an important landscape element for the town centre. The suburban form of development and the dominant visual effect of mature trees throughout the township are the defining elements of the existing landscape character and built form. These characteristics are indicative of the Shire's rural setting and settlement pattern.

#### RESIDENTIAL

Mundijong is a relatively compact residential village with a modified grid street system, surrounded by farmland and green spaces. **Figure 10** demonstrates that existing residential land is generally centred around the Mundijong townsite and decreases in density moving away from the town centre. Beyond the town centre, medium sized rural residential properties slowly give way to larger rural properties on the periphery. However, the impacts of population growth are becoming evident in the Mundijong District Structure Plan changing this historic settlement pattern. New residential development in the form of low density greenfield development has emerged in Whitby.

The Mundijong District Structure Plan aims to provide a high-level of residential diversity in order to deliver a contemporary village lifestyle in Mundijong and Whitby and to provide flexibility in meeting projected population opportunities. These types of development will greatly influence the Mundijong District Structure Plan and can broadly be arranged into three groups:

- + Medium/High (urban) density = R40 - R100 (25 units per hectare average);
- + Low/Medium (suburban) density = R15 - R40 (15 units per hectare average); and
- + Lower (transitional lots) density = R5 - R12.5 (10 units per hectare average).

#### RURAL

The 'Rural' land use category provides for a full range of rural land uses, tourism opportunities and the preservation of the natural landscape. The Mundijong District Structure Plan area is comprised of a number rural land uses and large landholdings. These are located on the periphery of the Mundijong District Structure Plan where many of the existing undeveloped areas are located. The Shire considers it is important to maintain rural land in close proximity to Perth to accommodate various rural industries and food production activities for the growing population. However, whilst it is important that rural land is preserved for this purpose it is acknowledged some of this land is reserved for urban development under the MRS and will be repurposed. For purposes of the Mundijong District Structure Plan the following terminology is used:

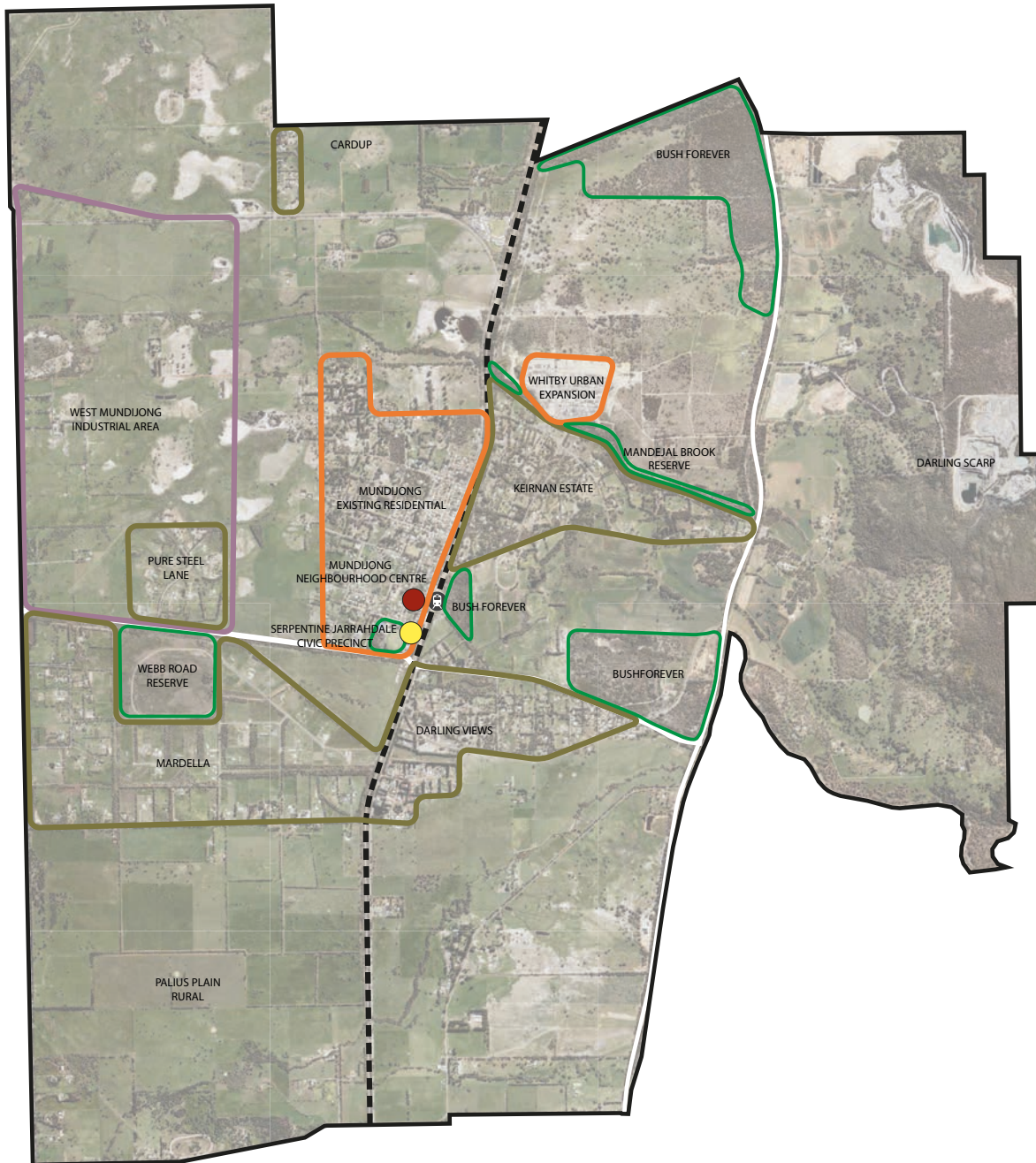
- + Rural Residential = 1-4 hectares; and
- + Rural = larger than 4 hectares.

#### INDUSTRIAL

Whilst no industrial land uses are currently provided within the Mundijong District Structure Plan area there is a significant industrial area proposed in West Mundijong (to be referred to as the Mundijong Industrial Area). This land was recently rezoned under the Shires TPS2 to facilitate development. It is comprised of around 420 hectares and is intended to accommodate up to 880 industrial lots. This development will also include the realignment of the freight rail line, meaning that the area will be even better connected to the services required for effective business operations, especially in the logistics industry.

The Mundijong Industrial precinct will facilitate future development and employment opportunities to benefit the wider south-eastern corridor of the metropolitan area, particularly the viability of the nearby Byford and Mundijong townsites. This area has also been identified as a potential intermodal facility site. The Department of Transport has advised that the feasibility of the proposed intermodal facility, and realignment of the freight line, will be the subject of more detailed assessment.

Figure 10: Existing Characteristics and Land Use



Mundijong Existing Land Use

Status : Preliminary (not to be used for feasibility purposes)  
Path : P:\363\Development Strategies for Serpentine-Jarrahdale

Scale 1:5,000 (P.A.)  
0 100 200 400

North

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 24/10/18

Hames Sharley

LEGEND

- MUNDIJONG DSP BOUNDARY
- EXISTING URBAN AREA
- RURAL RESIDENTIAL TRANSITION
- MAIN PARKS AND RECREATION
- INDUSTRIAL

## 2.2.2 ECONOMY AND EMPLOYMENT

### EXISTING EMPLOYMENT AREAS

As an emerging area current employment opportunities in the Mundijong District Structure Plan area are limited. Existing employment areas are described below.

#### Activity Centres

The majority of employment and activity in the Mundijong District Structure Plan area is consolidated around the existing Mundijong Town Centre on Paterson Street which is classified as a neighbourhood centre. The existing town centre fulfils an important role and contains a range of community and civic uses including the Shire of Serpentine-Jarrahdale Administration offices, a sporting reserve, a primary school, police station, and TAFE training centre. Retail and commercial activity is limited to approximately 800-1,000 m<sup>2</sup> of floor space, which includes a small scale supermarket inclusive of a deli and service station, a post office, café, and tavern. There are also two rural supply stores and one or two other smaller retail stores on the fringes of the town centre on Paterson street and Watkins road. The limited retail offer reflects the current small urban consumer catchment in Mundijong and some focus on rural supplies.

#### Industrial

As mentioned in Section 2.2.1 there are currently no industrial land uses in the Mundijong District Structure Plan area meaning contributions to employment is limited. A significant industrial area is proposed in West Mundijong, the benefits of which are described further in Section 3.

### EMPLOYMENT SELF-SUFFICIENCY AND SELF CONTAINMENT

Employment self-containment measures the proportion of local residents who also work in the Mundijong District Structure Plan area. It indicates the level at which local jobs meet the needs of local residents and determines how many of the Mundijong District Structure Plan residents have to leave the area for their work. **Table 5** demonstrates that employment self-containment within the Mundijong District Structure Plan area is very low. Only 248 local workers (25.3%). This suggests that 75% of the working population leave the area every day to access their places of employment which means that currently the Mundijong District Structure Plan area does not provide enough jobs, or the right jobs.

In 2016, the most popular industries in the Mundijong District Structure Plan by total employees were:

1. Construction (146)
2. Health Care and Social Assistance (85)
3. Retail Trade (84)
4. Manufacturing (70)
5. Transport, Postal and Warehousing (66)

In 2016, the industries with the highest levels of employment self-containment in the Mundijong District Structure Plan were:

1. Agriculture (81.0%)
2. Arts and Recreation Services (77.3%)
3. Education and Training (46.3%)
4. Rental, Hiring and Real Estate Services (40.0%)
5. Wholesale Trade (30.7%)



Table 5: Mundijong District Structure Plan Employment Self-Containment

INDUSTRY OF EMPLOYMENT	TOTAL LOCAL WORKERS Mundijong District Structure Plan*	LOCAL WORKERS RESIDING IN Mundijong District Structure Plan*	EMPLOYMENT SELF CONTAINMENT %
Agriculture, Forestry and Fishing	63	51	81.0%
Mining	57	3	5.3%
<b>Manufacturing</b>	<b>70</b>	<b>22</b>	<b>31.4%</b>
Electricity, Gas, Water and Waste Services	10	0	0.0%
<b>Construction</b>	<b>146</b>	<b>30</b>	<b>20.5%</b>
Wholesale Trade	27	10	37.0%
<b>Retail Trade</b>	<b>84</b>	<b>15</b>	<b>17.9%</b>
Accommodation and Food Services	32	5	15.6%
<b>Transport, Postal and Warehousing</b>	<b>66</b>	<b>13</b>	<b>19.7%</b>
Information Media and Telecommunications	0	0	0.0%
Financial and Insurance Services	18	0	0.0%
Rental, Hiring and Real Estate Services	20	8	40.0%
Professional, and Technical Services	32	7	21.9%
Administrative and Support Services	43	7	16.3%
Public Administration and Safety	52	6	11.5%
Education and Training	54	25	46.3%
<b>Health Care and Social Assistance</b>	<b>85</b>	<b>14</b>	<b>16.5%</b>
Arts and Recreation Services	22	17	77.3%
Other Services	48	5	10.4%
Inadequately described	45	12	26.7%
Not stated	8	4	50.0%
<b>Total</b>	<b>980</b>	<b>248</b>	<b>25.3%</b>

\* Calculated using ABS 2016 Census Table Builder tool, data was sourced from Mundijong, Whitby, and Mardella suburb datasets.

In summary, the findings of **Table 5** suggests there is a need to strategically target local jobs growth to improve employment self-containment. The Shire's Economic Development Strategy identifies a need for more local employment opportunities with a target for 45,000 new jobs by 2050. As one of the major growth centres in the Shire, it is important the Mundijong District Structure Plan contributes to this target because without additional local jobs, Mundijong and Whitby risk becoming dormitory suburbs which would create future issues around traffic congestion and numerous negative economic and community impacts.

It is important that the Mundijong District Structure Plan facilitates employment growth by capitalising on the Shire's competitive advantages which include:

- + Significantly growing population and large surrounding workforce catchment;
- + Affordability of land and access to key transport links;
- + Emerging tourism industry; and
- + Ability to capitalise on existing agricultural and equine industries which currently account for approximately 20% of the Shire's Gross Regional Product.

## 2.2.3 COMMUNITY AND SOCIAL INFRASTRUCTURE

### COMMUNITY INFRASTRUCTURE

Community infrastructure is the term used to describe facilities which accommodate services that support, contribute and respond to the needs of people living, working and studying in an area. A recent audit of existing community infrastructure identified that whilst some facilities in the Mundijong District Structure Plan area provide a high quality service others are underutilised. The Shire's Community Infrastructure Implementation Plan (CIIP), 2017 outlines key facilities of priority within the Mundijong District Structure Plan area as well as responsibility for future provision to form part of the Developer Contribution Plan and the Shire's 10 year financial plan.

In Mundijong, there is currently an adequate level of community infrastructure for the current population, most of which is concentrated in the old town centre. It is anticipated that a more equitable distribution of new community infrastructure will be required to cater for an increased population. The Mundijong District Structure Plan area can be characterised as having a relatively older demographic. However, new development in the north is attracting younger families where the need to provide for children and youth activities will be important. In the Mundijong District Structure Plan area there are a range of existing community infrastructure facilities which cater for local residents, these are identified in **Table 6** and on **Figure 11**:

*Table 6: Existing Community Infrastructure*

EXISTING COMMUNITY INFRASTRUCTURE			
1	Serpentine Jarrahdale Grammar School	9	Shire Dog Pound
2	Hendley Park	10	Mundijong Public Library and Shire Administration Building
3	Serpentine Jarrahdale Men's Shed	11	Community Resource Centre
4	Mundijong Primary School	12	Mundijong Netball Courts, Atwell Pavilion, Mundijong Pavilion, Mundijong Cricket Nets
5	Mundijong Sale Yard	13	SES Building and Mundijong Fire Station
6	Mundijong Old Railway Station	14	Mundijong Landcare
7	Timber Goods Shed Historical Building	15	Shire Depot
8	Mundijong Neighbourhood Skate Park	16	The House

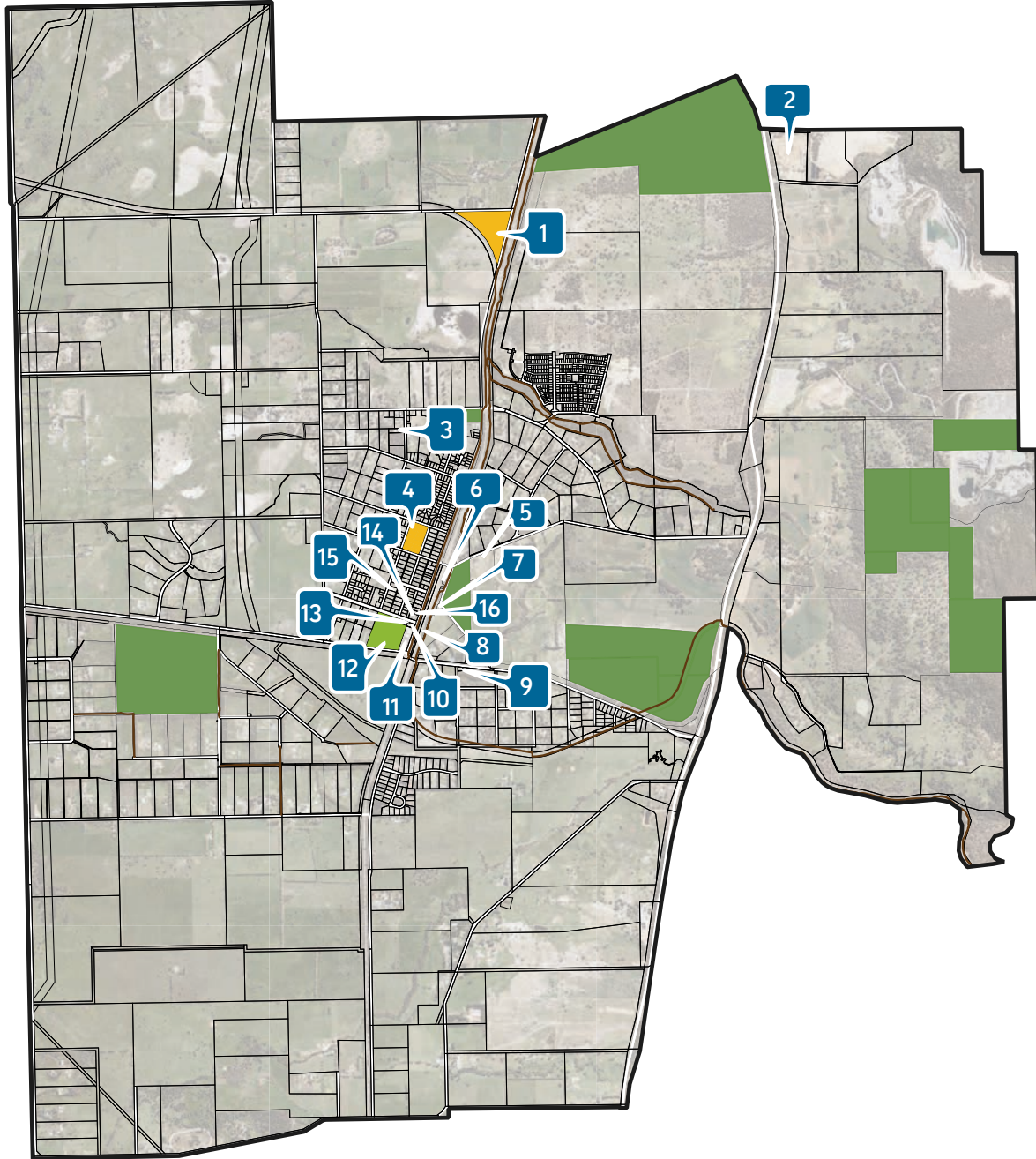
### SPORT AND RECREATION

The Mundijong District Structure Plan area provides a range of existing sport and recreation facilities which cater for both passive and active recreation. Numerous parks, nature reserves and sports fields provide opportunity for residents to engage in physical activity. The majority of active sport facilities are currently concentrated around Mundijong Oval. This precinct includes netball and tennis courts, a pavilion, and multi-purpose oval (cricket and football). Increased population growth will create demand for new facilities. As the Mundijong District Structure Plan area comes under greater pressure to accommodate a growing population (approximately 50,000 people by 2050) planning for additional facilities is required. The Mundijong District Structure Plan identifies the location of these proposed facilities.

### EDUCATION AND TRAINING

The Mundijong District Structure Plan currently contains one public primary school (Mundijong Primary School) and one private high school (Serpentine Jarrahdale Grammar School). As with all community infrastructure in the region, it is anticipated that a significant increase in education infrastructure will be required.

Figure 11: Existing Community Infrastructure



Mundijong Existing Community Infrastructure

Status : Preliminary (not to be used for feasibility purposes)  
Path : P:\A3874\Development Strategies for Serpentine-Jarrahdale

Scale: 1:15,000 (A1)  
0 100 200 300 400  
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Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 25/10/18



**LEGEND**

- MUNDIJONG DSP BOUNDARY
- PARKS AND RECREATION
- SPORT
- EDUCATION
- TRAIL

## 2.2.4 MOVEMENT AND ACCESS

### ROAD NETWORK

#### Primary Distributors

Form the regional and inter-regional grid of MRWA traffic routes and carry large volumes of fast-moving traffic. Some are strategic freight routes, and all are National or State roads. They are managed by Main Roads. Within the Mundijong District Structure Plan area, South Western Highway - is the only existing primary distributor road. South Western Highway is the primary north-south connector. It lies within the eastern portion of the Mundijong District Structure Plan area and provides connections between Bunbury and Armadale. It also connects Mundijong with other key townsites in the Shire such as Serpentine, Jarrahdale (via Jarrahdale Road) and Keysbrook.

In addition to the above, as indicated on **Figure 12** the proposed Tonkin Highway extension will extend southward to provide a connection through to Mundijong Road and further onto the Forrest Highway southwest of Pinjarra. Within the Mundijong District Structure Plan area, Main Roads WA proposes new intersection treatments on to Tonkin Highway at Bishop Road and Mundijong Road. The Primary Distributor network that includes South Western Highway, and future Tonkin Highway extension, is operated and maintained under the jurisdiction of Main Roads WA, the Shire manages the remaining local roads. Therefore, any proposals to alter or create new accesses to or from the Primary Distributors will require ongoing consultation with Main Roads WA.

#### Regional Distributors

Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. Regional distributors in the Mundijong District Structure Plan area include Mundijong Road / Watkins Road, which is the primary east-west connection through the Mundijong District Structure Plan area. These roads provide connections between the Kwinana Freeway and South Western Highway.

#### Local Distributors

The Mundijong District Structure Plan area also includes a number of key roads in the local movement network. These include:

- + Soldiers Road/Paterson Street - north-south connector adjacent to the railway line that provides a direct link to the Byford Town Centre;
- + Keirnan Street - east-west connector providing links between Soldiers Road and South Western Highway;
- + Kargotich Road - north-south connector providing links between Mundijong Road and Thomas Road.

### FREIGHT

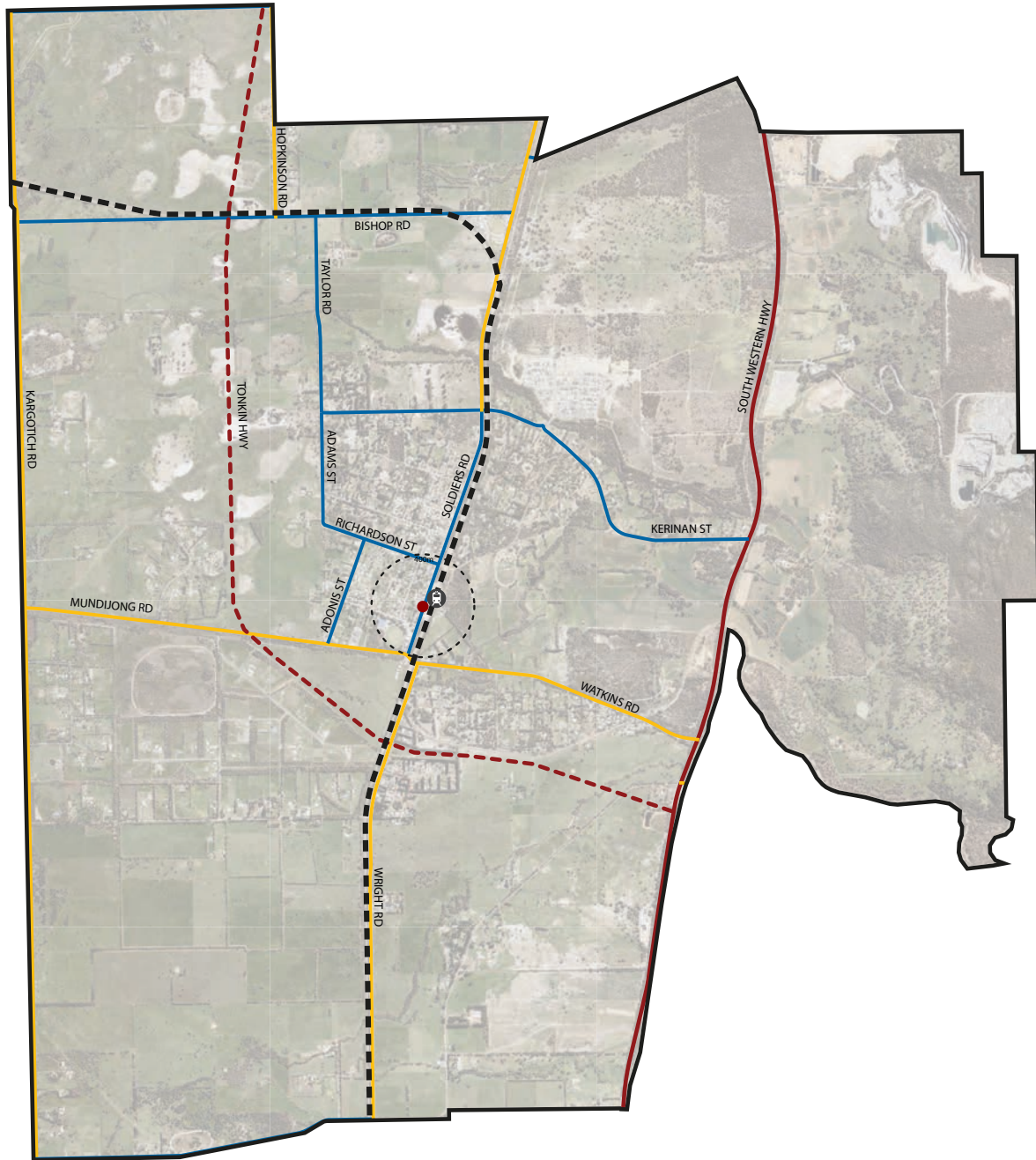
The freight network is critically important to the Western Australian economy. Where practicable, these transport corridors will need to be protected in the Mundijong District Structure Plan from the encroachment of sensitive and incompatible land uses. This is an important consideration when identifying locations for infill housing development. Similarly, the design, construction, upgrade and operation of this infrastructure within these corridors should seek to minimise impacts on surrounding land uses in accordance with SPP 5.4 Road and Rail Transport Noise and Freight Considerations in Land Use Planning.

Existing freight movement within the Mundijong District Structure Plan area includes both rail and road. The freight rail currently passes through the Mundijong Town Centre adjacent to Paterson Street. It connects to Kwinana. Freight movement via road is mainly accommodated along South Western Highway (north-south) and Mundijong Road (east-west).

### PUBLIC TRANSPORT

A key component of providing effective transport connections within the Mundijong District Structure Plan area will involve improvements to the provision and frequency of public transport, as well as the adaptability of the network to achieve sustainable outcomes. Primarily, an improved public transport will be required to align with the needs of a growing population in the Mundijong District Structure Plan area, and to meet the need for connecting people to key employment nodes. Secondly, good public transport will be necessary to reduce congestion in the shorter term and increase road capacity for transport functions reliant on the regional road system, especially freight movement.

Figure 12: Existing Movement Network



Mundijong Existing Road and Freight Network

Status: Preliminary (not to be used for feasibility purposes)  
 Path: P143524 Development Strategies for Serpentine-Jarrahdale

Scale: 1:50,000 © A1  
 North

Project Number: 43874  
 Drawing Number: A101  
 Revision: A  
 Date: 24/10/18

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**LEGEND**

- MUNDIJONG DSP BOUNDARY
- PRIMARY DISTRIBUTOR
- REGIONAL DISTRIBUTOR
- LOCAL DISTRIBUTOR
- FUTURE PRIMARY DISTRIBUTOR
- FREIGHT RAIL
- NEIGHBOURHOOD CENTRE
- STATION

**Rail**

TransWA currently provides rail access to the Mundijong District Structure Plan area via the Australind rail service (Perth-Bunbury). The train station is located in the Mundijong Town Centre on Paterson Street (**Figure 12**). A limited service is provided which includes a morning and evening service every day in both directions (four services total).

The proposed public transport network outlined in the South Metropolitan Peel Sub-regional Framework includes an integrated network of passenger rail lines and transit corridors. While Stage 1 of the METRONET passenger rail infrastructure includes the proposal to extend the Armadale rail line to Byford, further investigation are outlined for the longer term passenger rail infrastructure option to achieve better integration of the Australind service with the metropolitan passenger rail service between Perth and Mundijong, improving operational efficiency.

**Bus**

Bus services within the Mundijong District Structure Plan area are currently limited to two services which connect to Armadale Train Station via South Western Highway. The existing bus routes include:

- + Bus route 252 which provides a connection to the Mundijong Town Centre with a terminus on Paterson Street adjacent to Mundijong Train Station; and
- + Bus routes 253 provides a connection to Jarrahdale.

The greatest transport challenge in the Mundijong District Structure Plan area is the lack of adequate public transport services to enable residents to access employment and education opportunities. The nearest commuter train station is in Armadale. This forces a dependence on private vehicles that is unsustainable and inequitable. As the population grows improved connectivity, particularly to the west, will be required.

**ACTIVE TRANSPORT**

The existing pedestrian and cycle network in the Mundijong District Structure Plan area is very limited due to the rural nature of the surrounding area. Active modes of transport such as walking and cycling are currently available for short distance journeys within the urban areas, however, there are several opportunities for network improvements to address existing issues of disconnected streets, lack of footpaths, unsafe routes and long distances.

Within the Mundijong District Structure Plan area the existing freight railway line and Manjedal Brook create physical barriers limiting active transport. This could be a major deterrent for residents to walk and cycle for local trips. New north-south and east-west roads for local traffic, buses, cyclists and pedestrians across these barriers would improve connectivity in the Mundijong District Structure Plan and should be explored. There is also opportunity to utilise the central spine for a cycle and pedestrian network, connecting Mundijong to Byford in the north and Serpentine in the south. This can then be linked via district and neighbourhood roads and the Multiple Use Corridors (MUC) to establish a truly interconnected cycle and pedestrian network.

**2.2.5 SERVICE INFRASTRUCTURE****WATER SUPPLY**

Water is currently supplied to Mundijong via an off-take from the Serpentine Trunk Main at Wright Road, approximately 5.5 km to the south of the town. The Water Corporation has progressively replaced sections of this distribution main to address water pressure problems in Mundijong. It is anticipated that these upgrades should meet growth demands in Mundijong until around 2023. The medium term water scheme planning for Mundijong is to supply water from a new high level tank. The Sub-regional Planning Framework identifies conceptual water supply planning from the eastern Serpentine sector where major water storage reservoirs will be necessary in the escarpment near Byford Tank (Byford) and Mundijong Reservoir (Jarrahdale) to serve long-term urban development in these areas (WAPC, 2018).

The tank will supply southwards to Mundijong via large distribution mains to the proposed Mundijong Gravity zone. Some sections of the future distribution mains may need to be laid in stages as part of supply to Mundijong subdivisions as an interim solution while the area is still being supplied with water from the trunk main to the south. These mains would then

later be used to supply water from the north through the ultimate scheme. As per the Sub-regional Planning Framework (WAPC, 2018), an indicative water main is planned to connect the Mundijong area with Rockingham, known as the Mundijong-Tamworth Hill Trunk Main.

Water Corporation undertakes water services planning and allocates funds for infrastructure upgrades on the basis of land use planning information. Where a development proposal requires drinking water headworks infrastructure, for which the Water Corporation has not allocated funds to suit the developer's schedule, prefunding of the works may be necessary. Connection to a reticulated scheme water supply is not always possible for rural residential areas. State planning policy 2.5: rural planning policy (2016) recognises that there may be alternative service delivery models proposed and provides the following guidance (Essential Environmental, 2016):

- + where lots with an individual area of four hectares or less are proposed and a reticulated water supply of sufficient capacity is available in the locality, the precinct will be required to be serviced with reticulated potable water by a licenced service provider, including water for firefighting. Should an alternative to a licenced supply be proposed it must be demonstrated that a licenced supply is not available; or
- + where a reticulated supply is demonstrated to not be available, or the individual lots are greater than four hectares, the WAPC may consider a fit-for purpose domestic potable water supply, which includes water for firefighting. The supply must be demonstrated, sustainable and consistent with the standards for water and health; or
- + the development cannot proceed if an acceptable supply of potable water cannot be demonstrated.

## WASTEWATER

Mundijong is situated within the Water Corp's Byford Wastewater Scheme Catchment Area. The Corporation's wastewater scheme planning for the catchment has required a range of major headworks items to be constructed.

Wastewater infrastructure and a pump station have been installed to serve the Whitby development area. Land has also been purchased in Scott Road, adjacent to the future Tonkin Highway extension to accommodate an additional wastewater pump station, as reflected on the Mundijong District Structure Plan map. This is in the early stages of approval for construction. As an interim measure, wastewater will be pumped from Mundijong to Byford via a 'Type 90 Wastewater Pump Station (WWPS), having a 20-30m radius odour buffer. The longer term solution will be for the site to accommodate a 'Type 350' WWPS, having a 50m radius odour buffer. According to Water Corporation, the ultimate designed facility is to accommodate a 'Type 1000' WWPS located on the western side of the Tonkin Highway reserve, which will collect wastewater from the Byford pump stations via dual 600mm diameter wastewater pressure mains, through to the East Rockingham Waste Water Treatment Plan (WWTP), requiring a minimum 150m radius odour buffer.

Wastewater planning for Mundijong District Structure Plan area has been developed based on generalised land use, development and density/yield assumptions from previous iterations of the Mundijong-Whitby DSP. This identified the need for major gravity mains running east to west (downhill) through the development area and a large collector sewer along the western edge of the urban development area, accommodated within existing and future road reserves together with other domestic services. The width of road reserves and the size of these mains will need to be reviewed in more detail as more detailed structure planning progresses for the various precincts.

An interim wastewater strategy for this area is to convey wastewater from Mundijong and Byford northwards by pressure mains to the Waterworks Rd Main pump station (at the corner of Tonkin Highway and Armadale Rd, Westfield) and then onwards to the Woodman Point WWTP. Initial sewer flows from developments in the Mundijong area is being pumped northwards through the Byford sub-catchment via the Byford pump station, subject to capacity limits.

There is opportunity for an independent service provider(s) to supply wastewater services via a treatment facility within the Mundijong Industrial area, allowing potential for water reuse towards irrigation for farming and/or maintenance of District Open Space reserves.

## INTEGRATED WATER CYCLE MANAGEMENT

A Wastewater and non-drinking water strategy for Mundijong/Whitby was prepared in 2012 by Essential Environmental for the Shire of Serpentine Jarrahdale. The preferred strategy for delivery of wastewater and non-drinking water services for the population within the Mundijong District Structure Plan area is to construct a local wastewater treatment and recycling plant and provide a reticulated network to supply non-drinking water to private residences. Sewerage and non-drinking water services would be operated by an alternative service provider (i.e. not the Water Corporation) who could also provide drinking water services through a bulk supply arrangement with the Water Corporation, this would allow residents to deal with a single provider for all their water needs and provide increased financial feasibility for the service provider.

An infill sewerage program is also recommended as a part of the wastewater/non-drinking water scheme to connect existing residences to the sewerage system with two key benefits: 1) The presence of a predictable sewerage base load from day one of operation provides an income from start up for the service provider; and 2) The removal of septic tanks will positively contribute to the water quality of surface and groundwater systems in the Peel-Harvey catchment. The Shire together with the WAPC will need to carefully administer the provisions of the Planning and Development Act and Local Government Act to facilitate provision of key infrastructure, access easements and land to facilitate implementation of the strategy.

Key considerations include:

- + Appropriately zoned and tenured land will be required to accommodate key infrastructure.
- + Identification and protection of corridors of land and/or easements throughout the Mundijong District Structure Plan area necessary to facilitate provision of main distribution pipes, local water networks and sewerage pump stations.
- + Planning conditions will need to facilitate collection of any headworks charges and prefunding of distribution network by developers (if required).
- + The Shire of Serpentine Jarrahdale will need to act to facilitate connection of existing properties to any infill sewerage scheme.
- + Funding sources would be contributions from developers as well as State or Federal Government grants with the largest anticipated potential source being private funding of the scheme based on expected returns.

## 2.2.6 ENVIRONMENT AND LANDSCAPE

### FLORA AND FAUNA

#### Biodiversity Assets

The Shire is located within the Kwongan ecoregion of the South West Australian Floristic Region, which is one of only twenty-five biodiversity hotspots in the world. The Shire is part of two of Western Australia's bioregions - the Northern Jarrah Forest subregion, which includes the plateau and Darling Scarp in the east of the Shire, and the flat low lying Swan Coastal Plain subregion in the west of the Shire. The Swan Coastal Plain Bioregion, which makes up most of the Mundijong District Structure Plan area, is dominated by woodlands of Banksia and Tuart on sandy soils, she-oak on outwash plains and paperbark in swampy areas.

A total of three Declared Rare Flora (DRF) and one Priority Flora species have been identified within the Mundijong District Structure Plan area (SMEC, 2009). These are scattered mainly along the Mundijong Road verge and designated Bush Forever sites.

Threatened Ecological Communities (TEC's) and their associated threat category are assessed by the Department of Environment and Conservation. TEC's are identified by the Floristic Community Type (FCT) classification which have been identified and classified based on species composition across the Swan Coastal Plain. TEC's are included with a number of other Biodiversity Features and their buffers in areas designated as "environmentally sensitive areas" (**Figure 13**) and are protected under the Environmental Protection Act, 1986 (WA). Scheduled TECs are also further protected at the Commonwealth level under the EPBC Act.



There are five State listed TEC's within the Mundijong District Structure Plan area, two of which are also protected under the EPBC Act. Where the TEC is a wetland, the buffer distance incorporates the minimum area to protect the wetland from developments with potential to impact hydrology.

### **Bush Forever**

The majority of remnant vegetation and all TEC's in the Mundijong District Structure Plan area (**Figure 13**) are located in Bush Forever sites. Bush Forever sites are protected at the State level under the State Planning Policy 2.8 Bushland Policy for the Perth Metropolitan Region. Remnant vegetation is generally restricted to Bush Forever sites 354, 350, 365, 362, 360 and 71. The vegetation condition for these sites is mostly good to excellent condition. Descriptions are provided below:

- + **Bush Forever Sites 350 / 365** are representative of significant areas of remnant vegetation, recognised by the Shire as the Soldiers Road Flora Road (Shire of Serpentine-Jarrahdale 1992, Keighery 1996c cited from WAPC, 2000). With Bella Cumming Reserve this Flora Road forms Bush Forever Site 350. The Flora Road is a significant vegetation asset as it contains a north-south transect of plant communities, which is representative of the eastern side of the Swan Coastal Plain (WAPC, 2000). Bush Forever Site 350 also contains three TECs. The vegetation condition along Soldiers Road is considered to be 50% excellent to very good and 50% good to completely degraded, with areas of localised disturbance. The vegetation for the Bella Cumming Reserve is considered to be excellent to very good.
- + **Bush Forever Site 354** contains two TECs. The condition of the vegetation was found to be 90% excellent to very good and 10% good. The boundary of Bush Forever Site 354 has been successfully renegotiated with the WAPC by Urban Pacific.
- + **Bush Forever Site 360** contains plant communities representative of the eastern side of the Swan Coastal Plain that are considered to be regionally significant (WAPC, 2000), and four TECs. The vegetation condition of the site is considered to be 50% excellent to very good and 50% good to completely degraded, with areas of severe localized disturbance.
- + **Bush Forever Site 362** contains plant communities representative of the eastern side of the Swan Coastal Plain (WAPC, 2000), and three TEC's. The condition of the vegetation has been found to be 90% very good to good and 10% degraded.
- + **Bush Forever Site 71** being the transit Road Bushland forms part of a regionally significant contiguous bushland/wetland linkages containing plant communities representative of the eastern side of the Swan Coastal Plain (WAPC, 2000).

Any clearing proposed for an environmentally sensitive area (**Figure 13**) will need to be prepared under a specific permit and an environmental impact assessment (EIA) may be required (SMEC, 2009). Preparation of detailed LSP's within the Mundijong District Structure Plan area should give adequate consideration to contemporary mechanisms to retain and protect existing DRF, TECs, Conservation Category Wetlands and other environmental assets to the area, as well as achieving appropriate tree coverage. This will include the integration of mechanisms proposed within the Urban Forest Strategy currently being prepared by the Shire. This may consider the incorporation of trees into the Shires asset register through appropriate valuation.

### **Darling Scarp - Landscape Protection**

One of the most outstanding landscape elements of the Shire and one which lends much to the character of both the rural and urban areas within the Mundijong District Structure Plan area, is the backdrop provided by the Darling Scarp. As encapsulated in the text of LPP 4.3 Landscape Protection Area Policy, every landscape has a different capacity to successfully absorb change such as new development including subdivision, infrastructure works and extractive industry, and some landscapes are more valued by the community and more sensitive to change than others.

LPP 4.3 targets areas of high landscape value and aims to maintain the integrity of significant landscape areas and features. In particular, such areas occur all along the escarpment between the railway line and the top of the escarpment in a line of sight (viewshed) from the South Western Highway and along some major watercourses. Preservation of these viewsheds will need to be considered for any future development within the Mundijong District Structure Plan area.

### **Areas of Natural Beauty**

The Scheme contains provisions relating to Places of Natural Beauty, Historic Buildings, and Objects of Historical or Scientific Interest, where clearing of land or removal of trees is not permitted without the approval of Council. Within the Mundijong District Structure Plan a number of areas are identified.

Significant Areas of Natural Beauty include:

- + The Manjedal Brook dissecting the Mundijong District Structure Plan east-west, north of Mundijong.
- + Significant permanent wetland located off Soldiers Road
- + The Vegetation off Mundijong road is the only fully connected east west connection left in the Swan Coastal Plain
- + Norman Road Bushland has many different vegetation types located within it.

Any future planning in or around these sites will need to take into consideration these provisions, especially where Manjedal Brook links through to the Mundijong Industrial area to the west of the Mundijong District Structure Plan area.

### **Ecological (Green) Links**

The natural environment within the Mundijong District Structure Plan area is a major asset to the Shire and the wider region providing an important habitat to sustain a unique ecosystem and support biodiversity. As illustrated in **Figure 13**, Ecological (Green) Linkages running east-west align themselves with the areas natural drainage and the north-south corridor aligns itself with the railway line. Regional Ecological Linkages have been previously designated by the State Government as part of Bush Forever, Perth's Greenways and the System Six Study, and are now reflected in the Perth and Peel @3.5 million Sub- regional Planning Frameworks (WAPC, 2018), although it is noted that only those designated as Bush Forever have some protection for conservation purposes.

The proposed Ecological Linkages should not be confused with Multiple Use Corridors and Trails, which were not developed on ecological criteria and are not expected to achieve significant biodiversity conservation. However Multiple Use Corridors do form an important part of the ecology and environmental connections across the Shire.

Identification of Ecological Linkages is designed to protect existing natural areas that occur along the linkages, improve their resilience through management and revegetation of their buffers, and allow safe movement and growth of fauna and flora. It is noted, however, that many ecological linkages are associated with infrastructure corridors for roads, rail and drainage as illustrated in Figure 13, and are generally reserved for purposes other than conservation. Accordingly, many ecological corridors are often subject to disturbance (Essential Environmental, 2016).

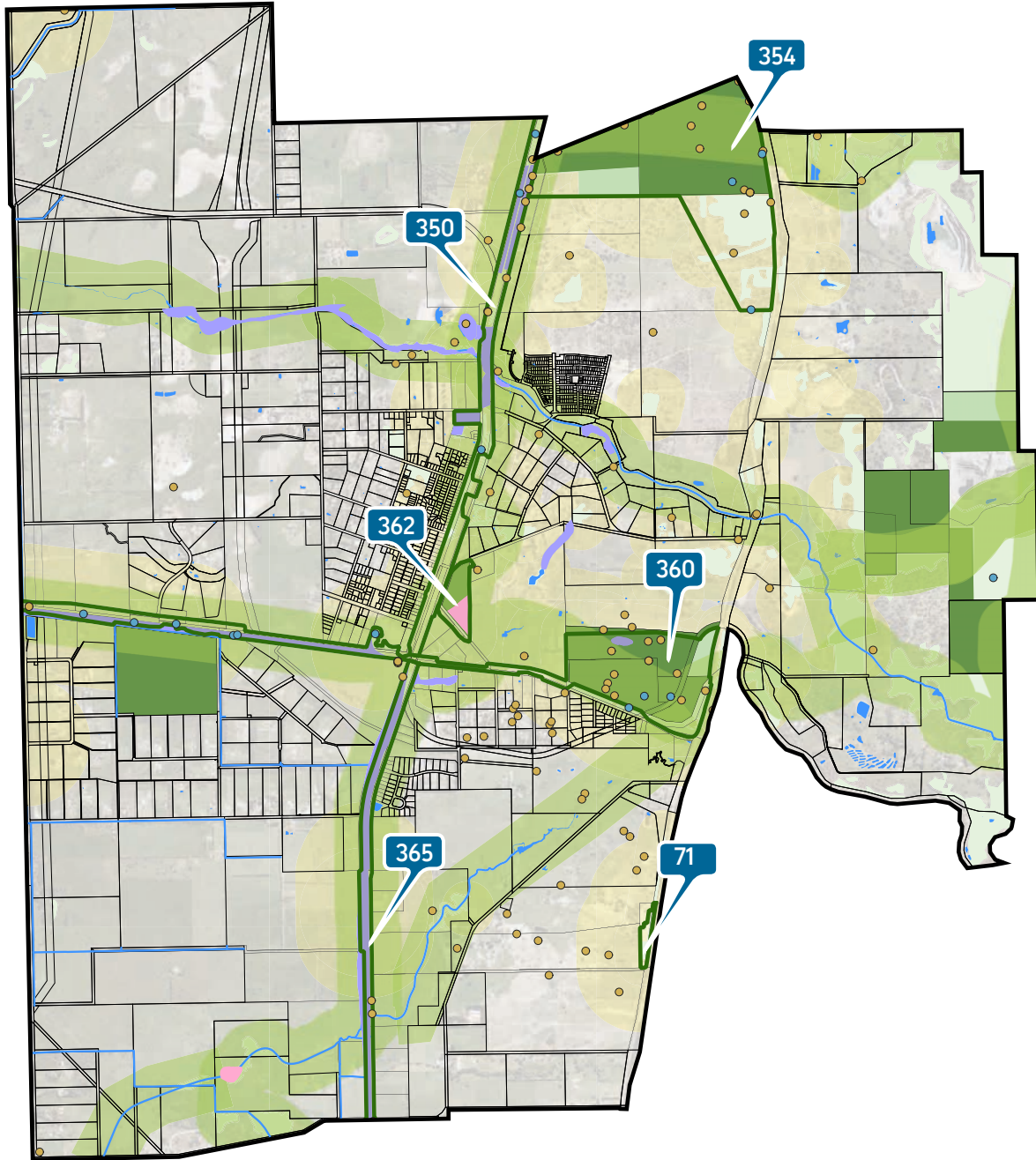
Ecological links are important to facilitate fauna movement and species adaptation to changing climate and conditions. Where these linkages are associated with infrastructure corridors, consideration should be given to the achievement of multiple objectives including biodiversity conservation through, for example, modification to the reserve purpose. Where Ecological Linkages occur in LSP areas, a Vegetation Management Plan should be prepared to reduce the impacts of development by applying a series of management actions addressing the relevant environmental factors (SMEC, 2009).

### **Conservation Significant Fauna**

The Swan Coastal Plain was once home to a great abundance and diversity of fauna, but habitat loss and alteration have severely reduced most populations. Surveys within the Mundijong District Structure Plan area have recorded a total of four native mammals and two introduced mammal species, six amphibians, 12 reptiles and 24 birds. Of these, five varieties of fauna are rare or likely to become extinct (SMEC, 2009).

One of the key species of focus of the Perth and Peel Green Growth Plan for 3.5 million is Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*), a species of Specially Protected Fauna known to feed, breed and roost in the Mundijong District Structure Plan area. They are a partially migratory species that breed in the wheatbelt in winter to mid-spring and wander in flocks to coastal areas for foraging in the non-breeding season. This bird species is listed as Critically Endangered under the Commonwealth EPBC Act and is now reliant on parkland areas in the Shire for feeding habitat. The main threats to the long-term survival of the species are loss of nesting hollows and food resources due to land clearing. Within the Mundijong District Structure Plan area, a number of hollows have been identified within Bush Forever zones illustrated in "**Figure 13: Existing Environment**" on page 67.

Figure 13: Existing Environment



Mundijong Existing Environment

Status : Preliminary (not to be used for feasibility purposes)  
Path : P:\3624\Development Strategies for Serpentine-Jarrahdale

Scale: 1:5,000 @ A1  
0 100 200 300 400  
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Drawing Number: A101  
Revision: A  
Date: 24/10/18



**LEGEND**

- |                          |                                |             |
|--------------------------|--------------------------------|-------------|
| — MUNDIJONG DSP BOUNDARY | GREEN LINKAGES                 | ● TEC FLORA |
| TEC BUFFER               | WATER BODIES                   | ● TEC FAUNA |
| NATIVE VEGETATION        | BUSH FOREVER                   |             |
| PARKS AND RECREATION     | CONSERVATION CATEGORY WETLANDS |             |
| RESERVE                  | RESOURCE ENHANCEMENT WETLANDS  |             |

It is recommended that fauna management plans are prepared at the local structure planning stage to address the loss of habitat where native vegetation is to be cleared. The plan should include the requirements to minimise clearing, retain regional and local ecological linkages and the relocation of fauna where necessary (SMEC, 2009). Where possible, significant hollow-bearing trees located in cleared pasture land adjacent to remnant vegetation areas should be preserved to facilitate the movement of fauna across the landscape and provide breeding and shelter resources for significant protected species, such as the Black Cockatoos.

## BUSHFIRE HAZARD

In accordance with the Map of Bush Fire Prone Areas gazetted by the Department of Fire and Emergency Services, the large majority of the Shire is classified as a bushfire prone area, with the exception of areas cleared for urban development, large water bodies, and areas affected by mining.

Areas within the Mundijong District Structure Plan have been identified as bushfire prone by the Fire and Emergency Services Commissioner so will require detailed Bushfire Hazard Assessment and application of Bushfire Management Plans to address bushfire risk as is the requirements of SPP 3.7: Planning in Bushfire Prone Areas and the Guidelines for Planning in Bushfire Prone Areas.

Likely measures for future planning and development include the provision of hazard separation through the placement of roads and / or managed local open space abutting areas of retained vegetation, and application of BAL construction standard requirements to lots in close proximity to areas of retained vegetation. Detailed assessments will be required as a routine component of the preparation of local structure plans.

## LANDFORM AND SOILS

### Land Form

The topography of the Mundijong District Structure Plan area, as shown in **Figure 14** at 5m contours, captures the unique topography and landform typical of the Shire with two distinct halves. To the west of the South Western Highway, the terrain is relatively low flat Palusplain (seasonally waterlogged land), typical of the Swan Coastal Plain, whilst the eastern portion is characterised by undulating ridge peaks and troughs of the landform of the Darling Plateau. At the junction of the two landforms, known as the Darling Scarp, the topography is steep, with an average gradient of five percent.

The topographic features of the Darling Plateau and Darling Scarp allow for substantial water bodies to form, such as the Serpentine, Pipehead and Wungong Dam, and are an important catchment for surface water runoff.

The Swan Coastal Plain has changed significantly, most importantly by draining of the extensive wetlands that once covered it for much of the year. Many of the drains intersect the groundwater, causing drawdown and reducing soil moisture content. The Palusplain soils within the Mundijong District Structure Plan area have been extensively cleared for agricultural.

### Acid Sulphate Soils

Acid sulphate soils in the Mundijong District Structure Plan are located to the west of the South Western Highway (**Figure 14**) they consist of moderate to low risk of actual acid sulfate soils or potential acid sulfate soils occurring generally at greater than 3 m depth. Low to no risk of actual acid sulfate soils or potential acid sulfate soils occurring generally at greater than 3 m depth can be found to the east of the South Western Highway in the Mundijong District Structure Plan area. The risk of acid sulfate soils being exposed to oxidation due to development in the Mundijong District Structure Plan area is considered low. As part of development requirements, new developments within the Mundijong District Structure Plan will need to introduce fill to a depth that is acceptable for residential construction as well as provide suitable flood clearance and adequate subsoil drainage. However, development techniques should be provided with any LSP, addressing potential risks to acid sulphate soils.

### Contaminated Sites

A significant portion of the Mundijong District Structure Plan is agricultural land, where a number of potential contamination commonly associated with rural activities have previously been identified, such as, arsenic-based sheep and cattle dips, landfill, spillages of hazardous chemicals and the storage of disused chemicals (SMEC, 2009). Given past and present use, it is unlikely that the potential sources of contamination detected would have resulted in significant soil or

groundwater impacts. However, it is recommended that further investigations (including sampling) within the Mundijong District Structure Plan area be undertaken to confirm this in future development stages. Consideration should also be given to the remediation of contaminated sites as part of any future development.

## 2.2.7 NATURAL RESOURCES

### WATER RESOURCES

Environmental impacts within the Shire affect significant water resources in the region with parts of the Peel Harvey Catchment and Jandakot Groundwater Mound located within the Shire. It is therefore crucial that the Shire's environmental values are preserved and that natural areas, areas of significant vegetation, wetlands and waterways are protected, preserved and enhanced as a central element of liveability and a defining characteristic of the Shire.

#### Surface Water

The most notable waterway within the Shire is the Serpentine River, which forms part of the Serpentine Dams (Serpentine Reservoir and Serpentine Pipehead Dam). The Serpentine River traverses the Shire south-east flowing through the western boundary of the Shire. The Serpentine main dam's capacity is one of the biggest dams supplying the Perth metropolitan area (Water Corporation, 2009).

As a result, several watercourses traverse the Mundijong District Structure Plan area in a generally westerly direction from the scarp as shown in **Figure 14**. These watercourses eventually discharge to the Serpentine River system, which links to the Peel Harvey Estuary. Surface hydrology in the Mundijong District Structure Plan area has four surface flows:

- + Manjedal Brook traversing the Mundijong District Structure Plan area from east-south-east to west-north-west;
- + Cardup Brook flowing east-north-east to west-south-west;
- + Gingagup Brook flowing east to west; and
- + A smaller unnamed ephemeral streamline (Stream A) flowing north-north-east to south-south-west.

Future urban development is likely to result in changes in surface and groundwater hydrology. This has the potential to pose a significant threat to local flora within the area. Many flora and vegetation communities are strongly influenced by water availability caused by modified water regimes and hydrological imbalances. Wetlands are particularly vulnerable to water regime changes as well as upland vegetation such as banksias which are sensitive to lowering ground water tables. No development should ideally occur within important wetlands, significant natural areas or wetland or significant natural area buffers. New subdivisions should ensure that Lot boundaries do not intersect important wetlands, natural areas or their buffers and prospective purchasers of land containing an important wetland, natural areas or their buffers should be made aware of development restrictions through restrictive covenant, conservation covenant or reservation.

Where future subdivision has the potential to impact on streams such as Manjedal Brook, a foreshore management plan should be prepared by the subdivider for approval. All remnant vegetation, fringing vegetation and ecological linkages associated with the wetlands and water courses should be maintained. Access to wetlands should be controlled and/or restricted. The exact nature of these measures should be determined during Local Structure Plan stage.

Discharge of stormwater may be permitted into a wetland if consideration has been given in the context of a water management plan. Water Management Strategies should be produced at the local structure plan stage to ensure that any existing inappropriate stormwater disposal to wetlands or water courses are replaced and that water management at the site is in accordance with relevant policies. Where development is proposed near a wetland, a wetland management plan should be prepared and include the following:

1. the wetland's buffer distance;
2. the proposed management of water within and in and out of the wetlands;
3. the management of groundwater and its recharge;
4. any approved groundwater abstraction allowances;
5. any required rehabilitation of the wetland(s);
6. site monitoring; and
7. the management of Acid Sulphate Soils (where applicable).

Current watercourses are maintained or enhanced to living streams wherever possible. Surface water should not be put directly into any wetlands or water courses without treatment first. Fill brought in is designed for maximising phosphorous retention time. Drainage in most cases is designed to minimise risk of erosion and maximise infiltration while decreasing any water-logging or flooding impacts. Any development is to be designed so that suitable fill material and drainage can be provided.

### **Ground Water**

The most significant groundwater resources underlie the Swan Coastal Plain portion of the Shire. This includes the superficial aquifer, which is unconfined and recharged by rainfall, and the deeper confined aquifers of the Leederville and Yarragadee. The Mundijong District Structure Plan area falls within the Serpentine Groundwater area of the northern Perth Basin and overlaps the Archaean terrain of the Yilgarn Shield. Generally within three metres of the surface in areas of sand, the groundwater quality is generally good but information on groundwater quality is limited ([Essential Environmental, 2016](#)). Groundwater flow was determined to generally be in a westward direction with some localised inflections towards Manjedal Brook.

Although groundwater allocation currently remains in most parts of the superficial aquifer, declining rainfall may result in reduced recharge and consequently availability in the future ([Essential Environmental, 2016](#)). The Shire is currently undertaking an Integrated Water Management Strategy to investigate water recycling and reuse, such as the reuse of fit-for-purpose water for irrigation of public open spaces, as a means to reduce demand and improve efficiency. These principles should be adopted for any future development within the Mundijong District Structure Plan area and investigations included in LSP proposals.

Groundwater levels can be reduced should garden bores be established. Draw-down of groundwater can cause serious detrimental effects, potentially resulting in the death of the groundwater-dependant vegetation. To ensure that future development within the Mundijong District Structure Plan area has a minimal impact on the groundwater-dependant ecosystems within and surrounding it, the following strategies should be implemented in collaboration with the Department of Water:

- + Determine the acceptable level of groundwater abstraction and hence the number of bores permitted and their specified abstraction rate;
- + Design all new developments within the Mundijong District Structure Plan area to ensure maximum recharge of groundwater; and
- + Establish unit discharge that is representative of pre-development levels.

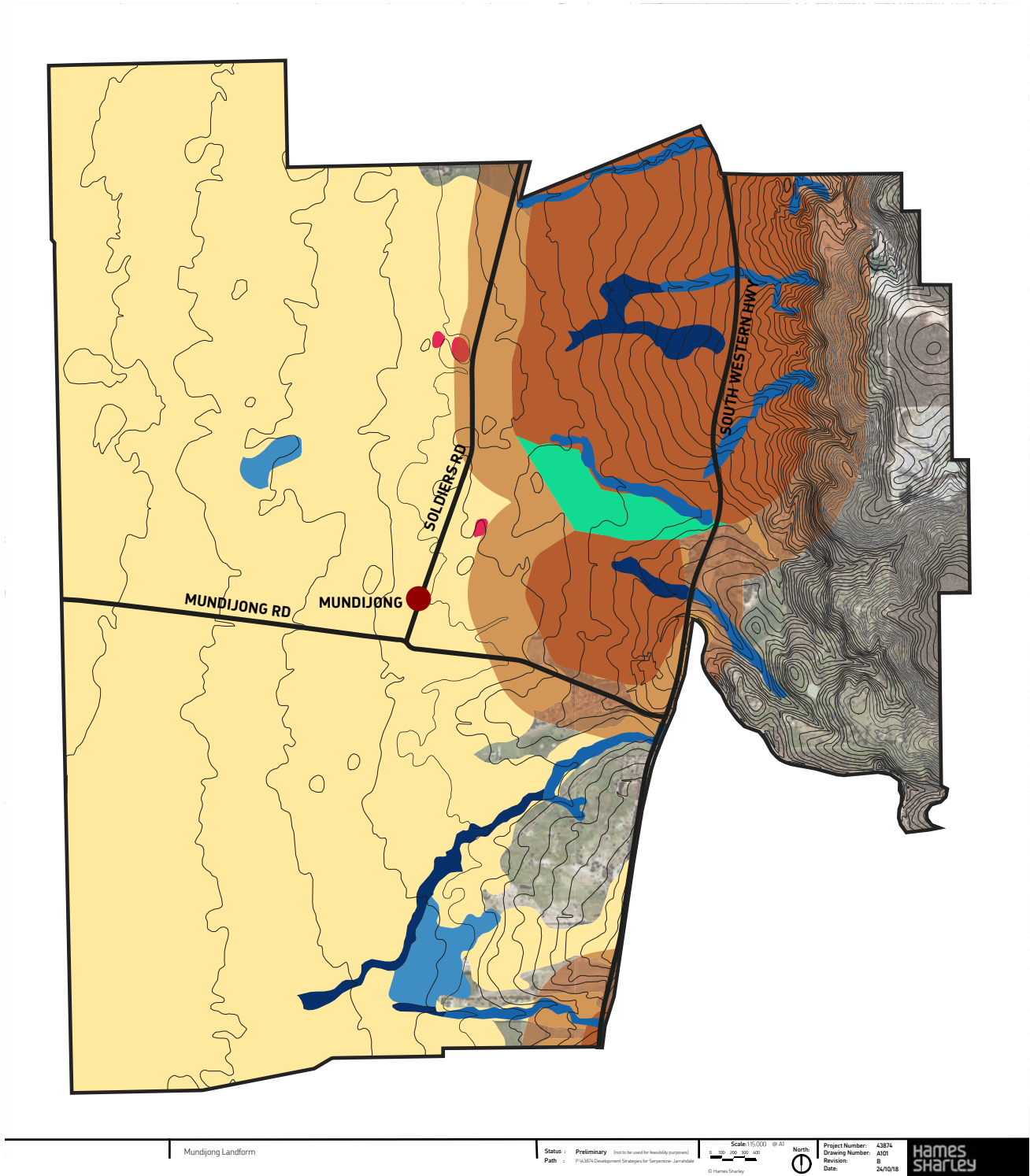
Clearing of land for agriculture and/or development may also result in threats to water quality, including exposure of acid sulphate soils, sediment and nutrient export and chemical pollutants. While the risk of acid sulphate soils being exposed is considered low in the Mundijong District Structure Plan area, new developments will need to introduce fill or alternative building practices including appropriate footing methods to a depth that is acceptable for residential construction, as well as provide suitable flood clearance and adequate subsoil drainage.

### **Flood Risk**

The Serpentine Jarrahdale catchment provides around 15% of the annual surface inflow to the Peel-Harvey system. As illustrated in **Figure 14**, two brooks pass through the Mundijong District Structure Plan area, flowing down from the Darling Scarp across the Swan Coastal Plain. These waterways are a key natural attribute attracting residents to the area. However, there is an associated flood risk to development near any waterway.

The risk of flooding in urban areas should be managed through the application of State Planning Policy 2.9: Water Resources. The Shire may also need to review existing townsite drainage systems and ensure appropriate levels of service will be maintained as development occurs and water quality of stormwater is addressed.

Figure 14: Existing Landform, Soils and Flood Risk



**LEGEND**

- MUNDIJONG DSP BOUNDARY
- 5m CONTOUR
- MODERATE TO LOW ACID SULPHATE RISK
- HIGH TO MODERATE ACID SULPHATE RISK
- TITANIUM-ZIRCON DEPOSIT
- STERILIZED AREA
- 500m BUFFER
- FLOOD RISK
- 30-50% MODERATE TO HIGH FLOOD RISK
- 50-70% MODERATE TO HIGH FLOOD RISK
- >70% MODERATE TO HIGH FLOOD RISK

Mundijong Landform

Status: Preliminary (not to be used for feasibility purposes)  
 Path: F:\2018\Development Strategies for Serpentine-Jarrahdale

Scale: 1:15,000 @ A1  
 0 100 200 300 400

North:

Project Number: 43874  
 Drawing Number: A101  
 Revision: 8  
 Date: 24/10/18

**Hames Sharley**

## BASIC RAW MATERIALS

Basic raw material resources occur within the Shire providing an important natural resource in close proximity to developing urban areas. It is important to identify the location of basic raw materials to ensure that these resources are protected and remain in non-urban zones. It is important for land use planning to consider environmental assets and natural resources at a strategic level to ensure that more detailed planning and development does not compromise the integrity of environmental systems and the accessibility of natural resources.

While The Department of Mines and Petroleum and Geological Survey of Western Australia currently identifies strategic resource occurring over most of the western portion of the Mundijong District Structure Plan, it should be noted that the potential extraction of this resource was considered as a part of the lifting of the 'Urban Deferred' zoning. Extraction of the sands is not economically viable, and is subject of considerable community opposition. The resource is not of sufficient importance to be included in WAPC's Statement of Planning Policy 2.4 Basic Raw Materials. It was deemed that urban development should proceed as reflected through the lifting of the deferment.

For industries operating within other areas of the Mundijong District Structure Plan, specifically within the north eastern portion, strong guidance should be provided for future rehabilitation and mine closure planning. Clearing of the land for resource extraction can result in a loss of biodiversity and can lead to erosion. Mining activities also impact on the visual landscape of the Shire and can result in off-site impacts on nearby land uses including dust, noise and light.

The basic raw material mapping will be further refined as part of the review of State Planning Policy 2.4 and in conjunction with the Strategic Assessment of Perth and Peel Regions.

## 2.2.8 HERITAGE AND CULTURE

Heritage places, including places of natural heritage value, are important contributors not only to the Shire's visual character but also to its cultural identity and the local economy through a multitude of tourism opportunities. The Shire has a rich history and contains many places of cultural heritage value to both Aboriginal and non-Aboriginal people. Recognising, respecting and celebrating heritage is a way of adding meaning to place, helping people to connect to and value the places they occupy, and to learn from the past.

### ABORIGINAL HERITAGE AND CULTURE

The original inhabitants of the Serpentine-Jarrahdale area are the Gnaala Karla Boodja Aboriginal people of the Noongar group of south-west Western Australia. The Gnaala Karla Boodja region encompasses the towns of Capel, Donnybrook, Balingup, Wickpin, Narrogin, Williams, Mundijong, Kwinana, Brookton, Pingelly, Wagin, Harvey, Collie, Pinjarra, Mandurah and Boddington (SWALSC, 2016, cited in Essential Environmental, 2016). McDonald & Thomson (2016, cited in Essential Environmental, 2016) state that the area around Mundijong, also located within Aboriginal country known as Beeliar, has ethnohistorical evidence showing that the rivers, creeks and wetlands in this region were intensively occupied, given the availability of fresh water and food resources. In particular, the alluvial plains and associated warran or native yam grounds and riparian resources such as Typha were of crucial economic importance to Aboriginal people.

The Department of Aboriginal Affairs maintains a register of known Aboriginal sites, which records the places and objects of significance that the Aboriginal Heritage Act 1972 (WA) applies to. Under this Act, obligations exist precluding the interference with registered sites without prior clearance, and disturbance of any artefacts discovered which will need to be observed by any development within the Mundijong District Structure Plan.

Existing Aboriginal heritage sites within the Mundijong District Structure Plan are illustrated on **Figure 15**. The sites identified are concentrated along the western flank of the study area and have been the subject of numerous Department of Indigenous cultural heritage surveys and reports reviewed by SMEC, 2009.

A key recommendation provided by SMEC is that the Shire of Serpentine Jarrahdale consult with the South West Land and Sea Council (SWLASC) in relation to all matters pertaining to Aboriginal heritage sites identified should they be subject to disturbance as a result of future development within the Mundijong District Structure Plan area. The Perth Regional NRM (previously The Swan Catchment Council (SCC)) has developed a 'one-stop shop' to help simplify the



Aboriginal consultation process to ensure that all the requirements of a Section 18 Notice under the Aboriginal Heritage Act are met by the proponents. Such an approach will ensure that the proponent has consulted with the appropriate representatives of the relevant Aboriginal people and in turn, reduce the prospect of impediments that may slow the consultation process.

### **NON-ABORIGINAL HERITAGE**

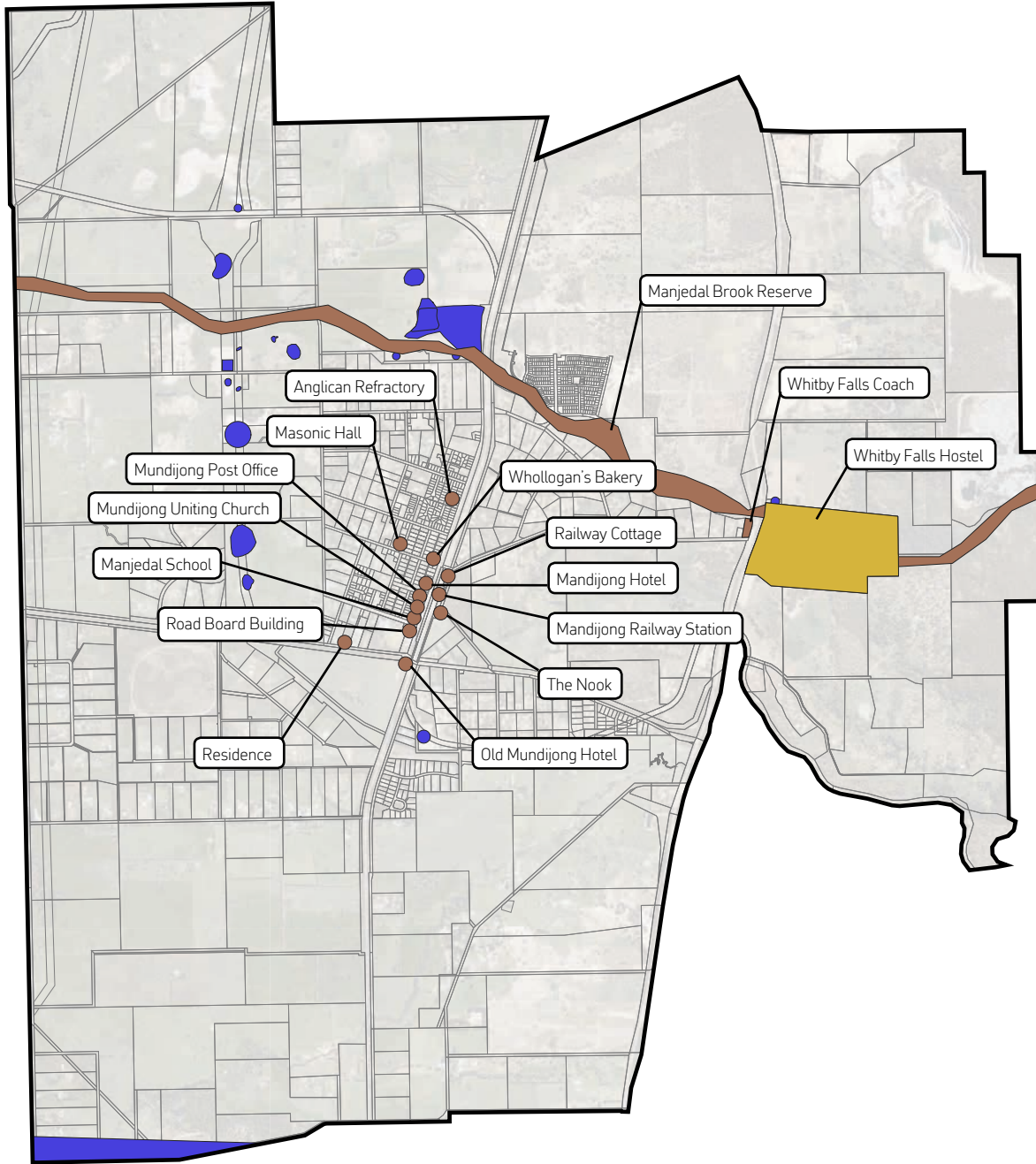
European settlement in the Shire of Serpentine-Jarrahdale dates from the 1830s, with land cleared and used primarily for farming and obtaining timber. The population was minimal until the late 1800s when many townships were established (including Mundijong), aided by the opening of timber mills in the 1870s and the construction of the South Western Railway from Perth to Bunbury in 1893, originally for timber transportation.

The Shire has established a local inventory (Municipal Inventory) within its district for the identification of, and protection measures for specific areas within the Mundijong District Structure Plan area. The State Register provides official recognition of a place's cultural heritage significance to Western Australia and assists the Heritage Council to identify, provide for, and encourage the conservation of heritage places. The State Register legally protects a site's significant cultural heritage from any changes. Any development proposals regarding a registered place must be referred to the Heritage Council for advice.

There are sixteen sites within the Mundijong District Structure Plan area that are listed on the Shire of Serpentine Jarrahdale's Municipal Heritage Inventory. Eight of these sites are all linked to the Shire of Serpentine Jarrahdale Town Planning Scheme No. 2, and as such are legally protected. These sites should be acknowledged as part of relevant Local Structure Planning (**Figure 15**)

While heritage is primarily managed through State and Commonwealth legislation, opportunities exist to protect and promote both Aboriginal and European cultural heritage through joint management arrangements with traditional owners and optimise opportunities for Indigenous training, employment and businesses.

Figure 15: Existing Heritage Places



Mundijong Heritage

Status : Preliminary (not to be used for feasibility purposes)  
Path : P143574 Development Strategies for Serpentine-Lambidge





Scale: 1:15,000  
0 100 200 400  
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Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 25/10/18



**LEGEND**

-  MUNDIJONG DSP BOUNDARY
-  STATE REGISTER
-  MUNICIPAL INVENTORY
-  ABORIGINAL HERITAGE

## 2.3 Opportunities and Challenges

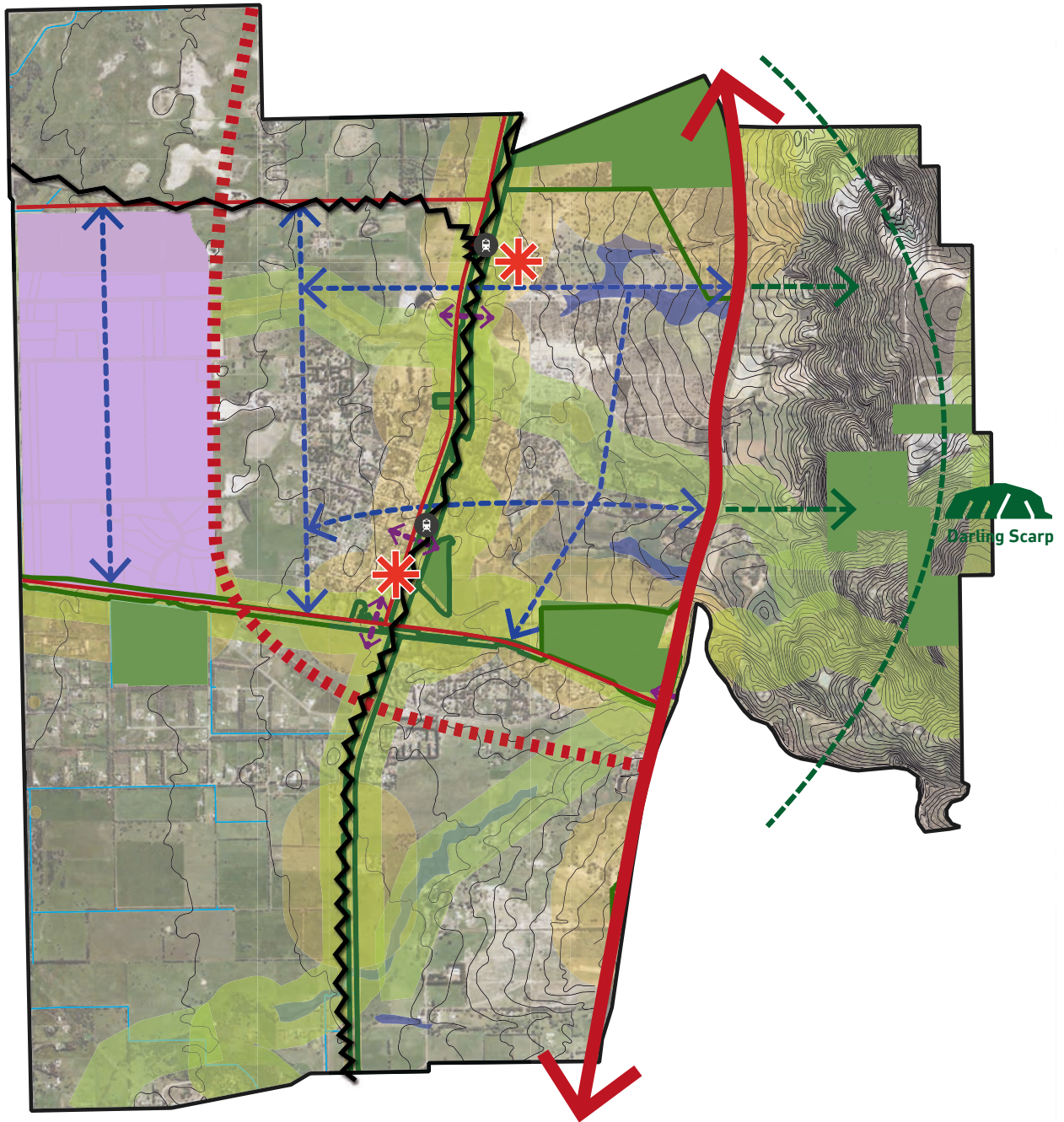
The analysis above has determined a number of opportunities and challenges for the Mundijong District Structure Plan area. These are summarised in **Table 7** and on **Figure 16**, they will assist in shaping the framework for a revised Mundijong District Structure Plan.

Table 7: Summary of Mundijong Opportunities and Challenges

	OPPORTUNITIES	CHALLENGES
Consolidated Urban Form	<ul style="list-style-type: none"> <li>+ Mundijong to consolidate as a traditional town centre focused around the train station. Opportunity to become an exemplar TOD development with grade separation, raised rail viaduct at Mundijong, improved access and integrated transport and development outcomes within a civic precinct.</li> <li>+ Increased housing choice to provide living opportunities for a diverse community.</li> <li>+ Built form that responds to land form, ground water and local climate and maximises amenity through green infrastructure.</li> <li>+ Provision of equine and "rural enterprise" lifestyle lots that do not impact on productive farmland or areas of high biodiversity value.</li> <li>+ The majority of the area is owned by only a few large landowners.</li> </ul>	<ul style="list-style-type: none"> <li>+ Potential disconnection between urban areas in Mundijong and Whitby due to the rail line.</li> <li>+ Fragmented land ownership in precincts B, F and L.</li> <li>+ Lack of housing and lot diversity.</li> <li>+ Western edge of town requires access and amenity buffers from Tonkin Highway extension and Freight rail realignment.</li> <li>+ Overcoming perceptions that Mundijong town centre is a declining rural centre and not a desirable place to live.</li> </ul>
Economy and Employment	<ul style="list-style-type: none"> <li>+ Build on Murdoch University facilities located at Whitby.</li> <li>+ Mundijong Industrial Area developed to stimulate local economic activity and employment with proximity advantage to potential new outer harbour.</li> <li>+ Mundijong consolidated as a traditional town centre with a range of activities and employment opportunities including civic and commercial.</li> <li>+ Whitby developed as a contemporary retail activity centre serving a more diverse future population.</li> <li>+ Local food supply reduces transport needs, provides local employment and optimises closed-circuit practices including industrial ecology techniques.</li> <li>+ Eco-tourism celebrating the area's natural beauty and biodiversity. This may include accommodation, entertainment and artistic as well as adventure and recreational activities.</li> <li>+ Educational opportunities associated with practical and on-ground environmental learning.</li> </ul>	<ul style="list-style-type: none"> <li>+ Lack of critical mass of population and activity limiting provision of services and retail.</li> <li>+ Limited employment and training opportunities for young people, employment self-containment is especially poor due to these limited opportunities.</li> </ul>
Community and Social Infrastructure	<ul style="list-style-type: none"> <li>+ Strategic planning framework in place for community infrastructure.</li> <li>+ Perception as a family friendly shire.</li> <li>+ Land available to consolidate civic/governance precinct at Mundijong as strong community node.</li> <li>+ Consolidate sport and recreation at Keirnan Park with good linkages to Mundijong and Whitby town centres.</li> <li>+ Collocation of ovals and sporting areas with primary and high schools with opportunity for shared infrastructure and management arrangements.</li> <li>+ Access to employment opportunities, retail and services, both within the immediate area improved via the Perth-Armadale Rail Line extending to Mundijong and the extension of public transport opportunities to the west.</li> <li>+ Coordination of improved east-west links across rail line to improve permeability across Mundijong District Structure Plan area.</li> </ul>	<ul style="list-style-type: none"> <li>+ Increasing population and settlement which requires funding, planning and development of new communities and associated infrastructure.</li> <li>+ Limited provision of facilities for an ageing population, major gap in health and ancillary services.</li> <li>+ Limited provision of facilities for youth and young families.</li> <li>+ Significant barrier of rail line through the Mundijong District Structure Plan area limiting east west connectivity.</li> <li>+ Lack of public transport between activity centres and regional destinations.</li> <li>+ Poor frequency of TransWA Australind train service.</li> </ul>

	OPPORTUNITIES	CHALLENGES
<b>Movement and Access</b>	<ul style="list-style-type: none"> <li>+ Extension of Tonkin Highway will improve regional access and alleviate traffic pressures on South Western Highway. Will also enable establishment of intermodal hub at West Mundijong.</li> <li>+ Realignment of freight rail line reduces impacts and barrier effect of rail line.</li> <li>+ Increased Australind service at Mundijong providing commuter access to Perth and Bunbury in the short-term, with the vision to eventually extend metropolitan rail service by influencing the outcomes of METRONET.</li> <li>+ Improved connectivity along streets and greenways to promote active transport.</li> <li>+ Improved and potential rapid bus service along Soldiers Road and the current freight rail corridor and freight rail alignment linking centres within the Shire.</li> </ul>	<ul style="list-style-type: none"> <li>+ Long term planning and delivery of METRONET largely unknown.</li> <li>+ METRONET will require park and ride facilities with a significant land requirement at end-of-line train station.</li> <li>+ Rail alignment and geometry requires careful design to ensure least impact on the local environment and amenity.</li> <li>+ Road environments that do not provide safe and convenient active transport.</li> <li>+ East-west transport linkages to employment in the west are inadequate and require residents to use single person vehicles to get there.</li> <li>+ The widening of transport corridors are constrained by environmentally sensitive flora.</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>+ Sustainable precinct- wide provision of services enabling disconnection of communities from centralised systems. This includes power, water, wastewater and non-drinking water.</li> <li>+ Decentralised waste-management strategies which optimise reuse and recycling of waste materials.</li> </ul>	<ul style="list-style-type: none"> <li>+ Groundwater in the Leederville aquifer is mostly allocated, with some remaining capacity within the superficial aquifer to supply groundwater for NDW.</li> <li>+ Lack of waste water provision.</li> <li>+ Funding constraints for infrastructure provision.</li> </ul>
<b>Environment and Landscape</b>	<ul style="list-style-type: none"> <li>+ The community's desire for a sustainable, connected and thriving community into the future supports many opportunities for environmental innovations.</li> <li>+ Reserves, areas of natural beauty and Bush Forever sites reinforce the area's distinctive visual character.</li> <li>+ Significant view corridors to the Darling Scarp reinforce the areas unique backdrop of natural beauty and its location in proximity to the region's national park and state forests.</li> <li>+ Consideration should be given to the prioritisation of protection of Local Natural Areas for incorporation into LPS 3.</li> <li>+ Natural drainage corridors provide for multi-use corridors to conserve existing vegetation, promote indigenous re-vegetation, providing recreational and active transport opportunities and surface drainage function.</li> </ul>	<ul style="list-style-type: none"> <li>+ Declining rainfall and rising temperatures have the potential to impact on the health of the environment and the community, as well increased maintenance costs for community infrastructure.</li> <li>+ Bush Forever sites, particularly along and east of rail line impacting on METRONET outcomes and consolidation of townsites.</li> <li>+ Flood risk associated with drains running across the Swan Coastal Plain.</li> <li>+ The majority of the area is located within a Bush Fire Prone Area of WA as designated by the Fire and Emergency Services (FES) Commissioner.</li> </ul>
<b>Natural Resources</b>	<ul style="list-style-type: none"> <li>+ Re-purpose of existing/proposed extractive industry sites and implement measures to ensure their rehabilitation upon closure.</li> </ul>	<ul style="list-style-type: none"> <li>+ Any further extraction of minerals and raw materials has the potential to impact on the health of the community and the environment through loss of vegetation, erosion, noise, dust and light.</li> <li>+ Visual impacts of extraction industries could limit tourism potential.</li> </ul>
<b>Heritage and Culture</b>	<ul style="list-style-type: none"> <li>+ Aboriginal Heritage Places, State Registered and Municipal Inventory Places and areas under an Assessment Program provide the opportunity to celebrate the areas natural heritage value, its cultural identity and build the local economy through unique tourism opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>+ Heritage and culture is shifting from a rural and country town community and settlement pattern to a more urban culture looking to establish a sustainable future.</li> </ul>

Figure 16: Mundijong Opportunities and Constraints



Mundijong Opportunities and Constraints

Status : Preliminary (not to be used for feasibility purposes)  
Path : P163674 Development Strategies for Serpentine-Jarrahdale

Scale: 1:5,000 @ A1  
0 100 200 300 400

North  
Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 24/10/18



**LEGEND**

- MUNDIJONG DSP BOUNDARY
- VIEW CORRIDORS
- FUTURE PEDESTRIAN LINKS
- FUTURE VEHICLE ACCESS
- ACTIVITY NODE
- TRANSIT NODE
- RAILWAY BARRIER
- TONKIN HWY EXTENSION
- PRIMARY DISTRIBUTOR ROAD
- REGIONAL DISTRIBUTOR ROAD
- 5m CONTOUR
- DRAINAGE
- HIGH FLOOD RISK
- BUSH FOREVER
- REGIONAL PARK/RESERVE
- GREEN LINKAGES
- TEC BUFFER
- FUTURE INDUSTRIAL



# 3.0 THE STRUCTURE PLAN



## 3.1 Strategic Intent

The Mundijong District Structure Plan map (**Figure 17**) has been prepared in response to the South Metropolitan Peel Sub-regional Framework, the Shire of Serpentine Jarrahdale Local Planning Strategy and associated Mundijong Development Plan, and the key opportunities and challenges identified in Section 2.3. It seeks to consolidate all previous plans developed for the area to provide a new Mundijong District Structure Plan.

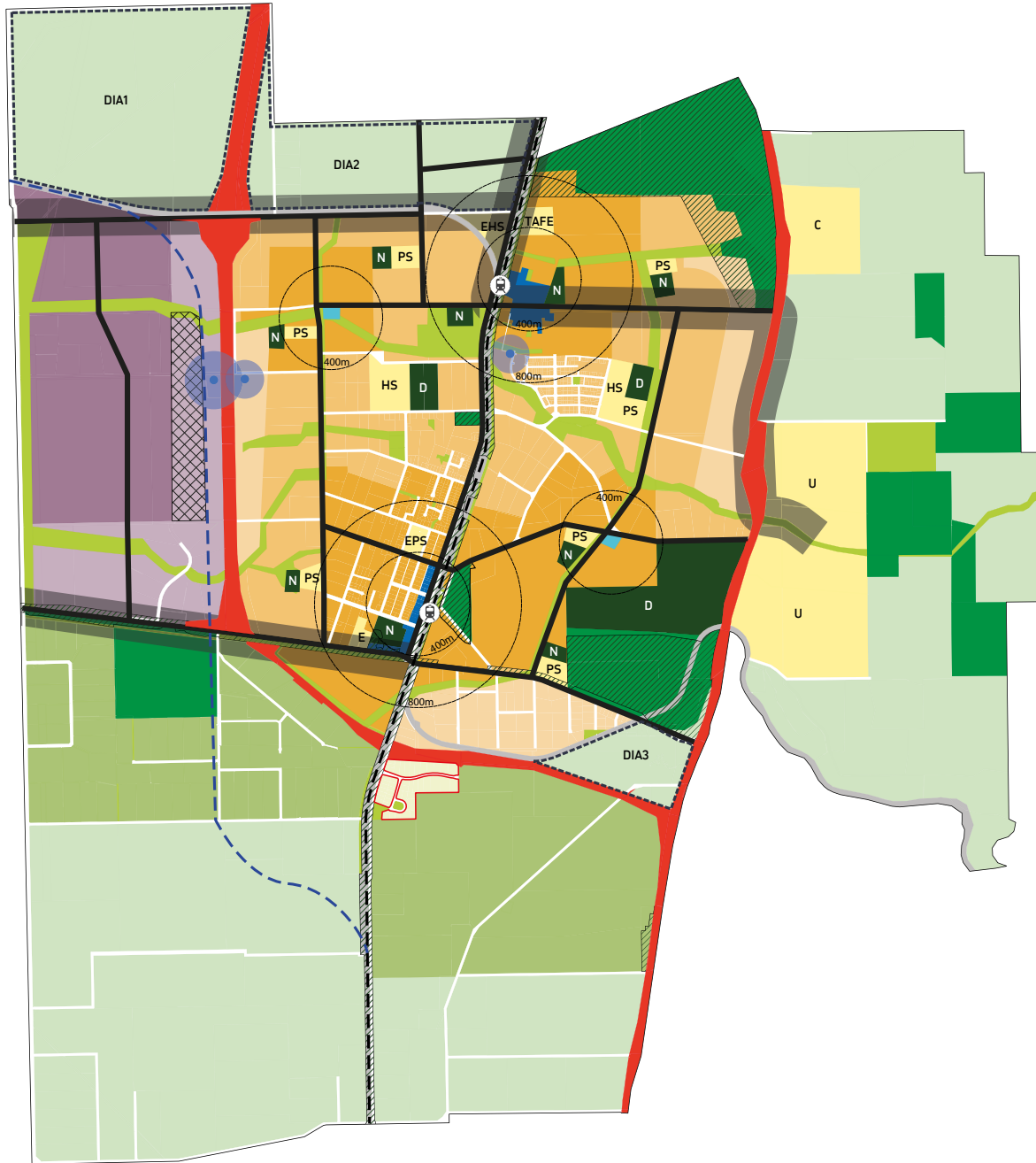
This will be achieved through the following key changes (from the 2011 Mundijong-Whitby District Structure Plan):

1. Consolidating previous plans for the area and improving the response to the State planning frameworks (most notably the South Metropolitan sub-regional framework), new State planning policies and local planning frameworks;
2. Expansion of the Mundijong District Structure Plan boundary to include strategic sites in the surrounding area;
3. Providing more emphasis on the redevelopment around the Mundijong town centre and railway station for the civic function and expressly encouraging the establishment of two larger activity centres, one in Mundijong (civic/governance) and one in Whitby (retail);
4. Leverage off the Tonkin Highway extension by establishing an employment hub in the Mundijong Industrial area;
5. Improved local distributor road network including realignment of future roads to improve connectivity to and within the Mundijong District Structure Plan area;
6. Identification for two proposed transit nodes for further investigation;
7. Realistic location for freight rail realignment;
8. Residential density ranges included on the structure plan map;
9. Identification of three development investigation areas;
10. Providing a rural residential transition zone between urban settlement and rural areas south of the Mundijong Town Centre;
11. Collocation of education and recreation facilities to make more efficient use of land and improve social cohesion in line with the Shire's approved community infrastructure strategies and plans;
12. Identification of locations for district and neighbourhood level public open space;
13. Relocation of the existing wastewater pump station (further south) and establishment of a new one in the Mundijong Industrial area;
14. More accurate delineation of multiple use corridors;
15. Relocation of the proposed neighbourhood centre on the western side of the Mundijong District Structure Plan area to respond to practical realities;
16. Identification of locations for a University Campus and cemetery east of South Western highway; and
17. Relocation of the proposed TAFE site.

The following section provides additional detail and justification for the changes proposed above.



Figure 17: Mundijong District Structure Plan



Mundijong District Structure Plan

Status: Preliminary (not to be used for feasibility purposes)  
Path: P:\2020\Development Strategies for Serpentine-Jarrahdale

Scale: 1:5,000 @ A1  
North

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 24/10/18

HAMES SHARLEY

**LEGEND**

- |  |                              |                                       |
|--|------------------------------|---------------------------------------|
| — MUNDIJONG DSP BOUNDARY                 | ■ MEDIUM - HIGH: R40-100     | ● WASTE WATER PUMP STATION AND BUFFER |
| ■ DISTRICT CENTRE                        | ■ LOW (SUBURBAN): R20-35     | --- DIA BOUNDARY                      |
| ■ NEIGHBOURHOOD CENTRE                   | ■ LOW (TRANSITIONAL): R10-15 | --- DEVELOPMENT INVESTIGATION AREA    |
| ■ COMMUNITY AND PUBLIC PURPOSE           | ■ SPECIAL USE                | ● EHS EXISTING HIGH SCHOOL            |
| ■ LIGHT INDUSTRIAL                       | ■ RURAL SMALL HOLDINGS       | ● EPS EXISTING PRIMARY SCHOOL         |
| ■ INDUSTRIAL                             | ■ RURAL                      | ● HS HIGH SCHOOL                      |
| ■ BUSH FOREVER                           | ■ PRIMARY DISTRIBUTOR        | ● PS PRIMARY SCHOOL                   |
| ■ DISTRICT/ NEIGHBOURHOOD OPEN SPACE     | ■ DISTRICT DISTRIBUTOR       | ■ D DISTRICT OPEN SPACE               |
| ■ RESERVE                                | ■ RAILWAY RESERVE            | ■ N NEIGHBOURHOOD OPEN SPACE          |
| ■ MULTIPLE USE CORRIDOR/LOCAL OPEN SPACE | --- FREIGHT RAIL REALIGNMENT | ■ U UNIVERSITY/ INNOVATION HUB        |
| ■ INTER-MODAL FACILITY                   | --- RAIL LINE                | ■ C CEMETERY                          |
| ■ HIGH FREQUENCY TRANSIT CORRIDOR        | ● TRANSIT NODE               | ■ E EMERGENCY SERVICES                |

## 3.2 Land Use and Activity

It is critical that planning for the predicted population growth of the Mundijong District Structure Plan area promotes urban consolidation by focussing development around the existing and future activity centre, providing efficient use of existing transport networks, service infrastructure, employment and key community/social infrastructure facilities. The Mundijong District Structure Plan seeks to optimise the use of land in close proximity to key public transport infrastructure to establish new nodes of activities, underpinned by high-quality built form and public spaces linked within a green network.

### 3.2.1 POPULATION AND DENSITY

SJ2050 and the Shire's Local Planning Strategy identify that the Mundijong District Structure Plan area will need to accommodate a population of approximately 50,000 people by 2050 to meet the Shire's long term growth targets. This growth is planned to be provided in both the residential zoned areas and development investigation areas (DIA2 and DIA3) identified on the Mundijong District Structure Plan Map (**Figure 17**). These areas delineate a defined urban growth boundary (**Figure 18**) which seek to limit expansion, enabling the preservation of the existing rural-residential character in the Mundijong District Structure Plan fringe.

Based on the Shire's average of 2.89 people per household approximately 17,300 dwellings would be required to achieve a population of 50,000. In calculating the estimated population the following methodology was applied to calculate the estimated dwelling/lot targets for each precinct:

1. A review of the estimated dwelling yields for areas covered by an approved LSP (Precinct A, part Precinct E).
2. The square metre (m<sup>2</sup>) estimates for broad hectare (Precincts C and G and part Precinct E) areas not yet subject to LSPs have been determined through identifying their total land area, deducting 40 percent of this land area (accounting for land required for public purposes such as roads, public open space and drainage) and multiplying by R25 to derive the potential lot yield.
3. The lot estimates for infill sites (Precincts B, D and F) not yet subject to LSPs were determined through manual calculations of the development potential of each landholding based on an R25 residential density of 350m<sup>2</sup>.
4. By adding the lot yields calculated in steps 1-3, the total estimated lot yield for the Mundijong District Structure Plan area was determined.

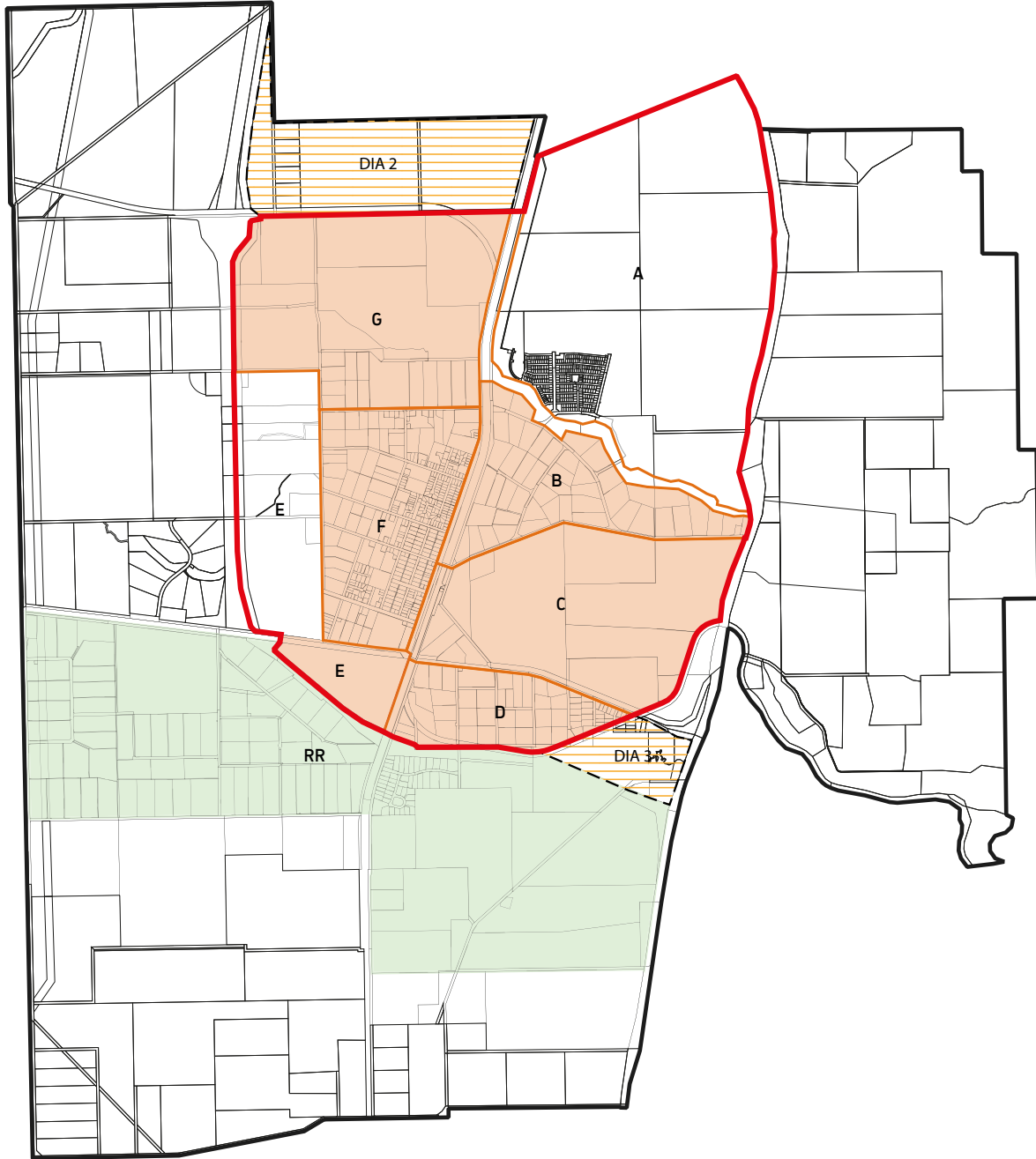
**Table 8: Approximate Population and Dwelling Targets**

STRUCTURE PLAN PRECINCT	ESTIMATED DWELLINGS	ESTIMATED POPULATION
A - Whitby	3,750	10,837
B - Keirnan Street	1,695	3,730
C - Watkins Road North	3,172	6,988
D - Watkins Road South	1,134	2,496
E - Mundijong West	1,835	5,303
F - Mundijong Town Centre	2,831	10,571
G - Mundijong North	3,175	8,557
Rural Residential	110	318
<b>SUB TOTAL</b>	<b>17,702</b>	<b>51,159</b>
DIA 2	2,220	7,311
DIA 3	555	1,806
<b>TOTAL</b>	<b>20,477</b>	<b>59,179</b>

Notes: Methodology applied a conservative estimate of R25. It is expected that more detailed estimates will be provided in the ACP/LSP stage which include a distribution of densities. Calculations exclude DIA 1 as this area is proposed for the investigation of a rural enterprise cluster outlined in Section 1.7.1.

**Table 8** identifies that the Mundijong District Structure Plan area has the capacity to accommodate approximately 59,179 residents which aligns with the Mundijong District Structure Plans population forecast. It is important that precincts without existing LSPs endeavour to meet the targets identified in **Table 8** to align not only with State planning expectations for infrastructure provision but also with the Mundijong Development Contribution Plan.

Figure 18: Urban Growth Capacity



Mundijong Urban Growth Capacity

Status: Preliminary (not to be used for feasibility purposes)  
Path: P:\2018\Development Strategies for Serpentine-Jarrahdale

Scale: 1:15,000 @ A1  
North

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 24/10/18



**LEGEND**

- MUNDIJONG DSP BOUNDARY
- URBAN GROWTH BOUNDARY
- POPULATION CATCHMENT AREAS
- AREAS WITHOUT A STRUCTURE PLAN
- DEVELOPMENT INVESTIGATION AREA
- RURAL RESIDENTIAL (LARGER LOTS)

## 3.2.2 LAND USE

The Mundijong District Structure Plan identifies the broad land use zones to guide future development in the surrounding area. The proposed intent of the various zones/land uses is described below.

### ACTIVITY CENTRES

The Mundijong District Structure Plan identifies a total of four activity centres which are evenly distributed throughout the structure plan area. The activity centres are based around a clear hierarchy which is explained below. Activity centres are expected to be the primary locations for localised activity and medium-high density housing. The premise for the hierarchy is based on the original philosophy contained in section 8 of the 2011 Mundijong Whitby District Structure Plan and its associated retail study. The Mundijong District Structure Plan does strengthen the civic role of the southern Mundijong centre.

#### District Centre

The Mundijong District Structure Plan identifies two district centres - Whitby District Centre and Mundijong District Centre. Both District Centres are expected to accommodate a finer grain urban form with a larger focus on medium and high-density housing. The two centres will provide vastly different roles.

The Whitby District Centre will be the primary location for retail activity, commercial, employment, and medium-high density housing. The Whitby District Centre will be located in the northern portion of the Mundijong District Structure Plan on the eastern side of Soldiers Road. It will be the primary retail hub and act as a catalyst for a mix of uses and housing choice servicing an extensive catchment. An Activity Centre Plan will need to be prepared in accordance with SPP4.2 to provide further guidance on land use, residential density, and urban form.

The Mundijong District Centre will continue to perform its role as the Shire's 'Civic and Governance Precinct' centred around the existing urban core on Paterson Street. In a retail sense the Mundijong District Centre will also continue its role as a neighbourhood centre. It has been classified as a District Centre due to the range of uses provided and significant role the centre plays in the context of the Shire. In the long-term Mundijong District Centre also has capacity to expand its retail function and become a TOD, however, this is dependent on the outcomes of METRONET.

#### Local Centre

Two local centres are identified in the Mundijong District Structure Plan - these are located in the north-west and south-east of the Mundijong District Structure Plan area respectively. The primary role of the local centres is to support the district / neighbourhood centres. Walkability and cycling access are key drivers for local centres therefore they will require minimum dwelling densities to be achieved to be viable from the walkable catchment. It is recommended that LSPs achieve a minimum density of 25 dwellings per hectare within the 800m radius.

### URBAN SETTLEMENT

As discussed in Section 3.2.1 the Mundijong District Structure Plan is expected to accommodate a population of up to 50,000 people. The Mundijong District Structure Plan map identifies an urban growth boundary which determines where residential development will be permitted. The purpose of the growth boundary is to ensure further encroachment into existing rural residential and rural land is prohibited to ensure that the existing rural character is preserved. However, the potential for realisation of higher densities should be explored in urban areas to ensure that a range of housing types from single bedroom to family households are provided. The adaptability of housing to accommodate ageing-in-place and universal access will also need to be addressed. Aged and dependent housing and 'lifestyle villages' may also have a place to cater for a wide variety of lifestyle preferences and price points.

Residential development in the Mundijong District Structure Plan area can be broadly classified into the following categories (similar to the residential component of the previous Mundijong-Whitby District Structure Plan):

#### Medium/High Density (Urban)

Medium/high densities will be based on density codes which range from R40-R100. Housing typologies in these areas should include dwelling types such as terraces (grouped dwelling) and apartments (multiple dwelling) provided in close proximity to amenity and public transport. This will give residents with additional choice and diversity, promoting opportunities for ageing in place.

Medium/high density development will be limited to specific areas within the Whitby District Centre and Mundijong Town Centre in Precinct A and Precinct F respectively. The final density range and distribution shall be determined through preparation of an Activity Centre Plan for Whitby and LSP for Mundijong. Residential densities within the Whitby District Centre should be guided by the requirements of SPP 4.2 Activity Centres for Perth and Peel.

### **Low Density (Suburban)**

Low density suburban development will be the most common type of development within the Mundijong District Structure Plan. Density will range from R20-R35 and single detached housing is likely to be the most common type of dwelling in the suburban setting.

LSPs should ensure equitable access to public open space, linear parks, community facilities, local centres and public transport routes. Residential development based upon the upper end of the density range should be provided around the proposed neighbourhood centres. The final density range and distribution shall be determined as part of Local Structure Planning.

### **Low Density (Transitional)**

Larger lots (800m<sup>2</sup>-5,000m<sup>2</sup>) are encouraged on the peripheries of the urban settlement zone where possible to contribute to the rural character of Mundijong, providing a gradual transition from high-density to rural residential. Density will range from R10-15 and single detached housing is likely to be the most common type of dwelling in the suburban setting.

### **Rural Residential**

The rural residential transition zone will facilitate a gradual transition in development intensity from the urban areas to the rural surrounds. They will also provide opportunities to provide buffers around sensitive areas. Rural residential will be based around lots which range from 1-4 hectares.

## **RURAL**

Rural areas within the Mundijong District Structure Plan perform a dual role. They contribute to both the local economy and the natural landscape and character in the Mundijong District Structure Plan area. The urban growth boundary identified on the Mundijong District Structure Plan map will ensure that rural land is protected from urban sprawl and retained to enable expansion of the local agricultural economy.

## **INDUSTRIAL**

A new industrial area of approximately 420 hectares is identified in West Mundijong with an anticipated 880 lots. It is expected to generate a significant employment opportunities, boosting the local economy.

## **DEVELOPMENT INVESTIGATION AREAS**

The Mundijong District Structure Plan identifies three DIAs. The intent of these DIAs is to provide future opportunities for expansion to increase the number of jobs and dwellings the Mundijong District Structure Plan can accommodate. In summary the intent of each DIA is as follows:

- + DIA1 - Investigate potential to establish a rural enterprise zone to leverage off and support development in Mundijong Industrial Precinct;
- + DIA2 - Investigate opportunity for urban expansion to provide additional dwellings with a focus on innovation; and
- + DIA3 - The purpose and intent of DIA3 is to explore the potential for a rural/urban interface area with consideration for innovative housing opportunities that respond to the landscape.

Specific criteria are required to be addressed before the Shire can consider implementing the DIAs. Specific considerations for each DIA are identified in Table 1.

## 3.3 Economy and Employment

### 3.3.1 ECONOMY

#### ACTIVITY CENTRES

As discussed in Section 3.2.2 the Mundijong District Structure Plan proposes a network of activity centres which are earmarked as strategic locations for employment growth. The Shire's activity centre strategy determines that approximately 20-25% of the Mundijong District Structure Plans jobs should be located within the defined activity centres. It is expected that this growth would accommodate industries such as retail, professional services, and financial services, however, it should also provide opportunities for start-ups and small businesses to cluster and grow.

Retail demand is expected to be a major driver of economic growth. Based on population projections, the Activity Centre's Strategy identifies that the Mundijong District Structure Plan (**Figure 19**) are strategically placed to accommodate the most retail growth within the Shire because it is centrally located within the Shire, servicing a broader area than Byford. In addition, it is further away from major competitive centres to the north of the Shire's boundary (e.g. Armadale) meaning Mundijong has greater capacity to grow compared to Byford.

The Mundijong-Whitby Activity Centres Background Paper (Appendix 8) identifies that the Mundijong District Structure Plan could accommodate 32,000m<sup>2</sup> of retail. However, this figure was based on an estimated population of 30,000 people. With population projections increased to a max of 50,000 people the Shire's Activity Centre's Strategy has increased the projected retail and commercial floor space requirement to more than 42,000 m<sup>2</sup>. This supports the Mundijong District Structure Plans delineation of two district centres. A breakdown of each centre's characteristics are provided below:

Centre	Whitby District Centre
Catchment	Entire Mundijong District Structure Plan area and southern portion of Byford District Structure Plan area (e.g. Cardup)..
Anchor	+ x1 full line supermarket + x1 Discount Department Store + x75 specialty retail tenancies
Total Retail Size	+ 19,000 m <sup>2</sup> - 3,500 (supermarket) - 8,000 (DDS) - 7,500 (speciality)
Configuration	Hybrid centre incorporating Main street and free standing mall
Commercial	10,000 m <sup>2</sup> of office space
Timing	Short-medium term (0-10 years)

Centre	Mundijong Civic and District Centre
Catchment	Entire Mundijong District Structure Plan area and suburbs such as Mardella and Jarrahdale.
Anchor	+ x1 full line supermarket + x30 specialty retail tenancies
Total Retail Size	+ 6,500 m <sup>2</sup> - 3,500 (supermarket) - 3,000 (speciality)
Configuration	Hybrid centre incorporating Main street and free standing mall
Commercial	2,000 m <sup>2</sup>
Community	5,000 m <sup>2</sup> (Shire Administration and community uses)
Timing	Long-term (+10 years)

<b>Centre</b>	<b>East and West Mundijong Local Centres</b>
<b>Catchment</b>	Local catchments of up to 1km.
<b>Anchor</b>	+ x1 small supermarket + x10 specialty retail tenancies
<b>Total Retail Size</b>	+ 2,500 m <sup>2</sup> - 1,500 (supermarket) - 1,000 (speciality)
<b>Configuration</b>	Hybrid centre incorporating Main street and free standing mall
<b>Commercial</b>	No specific area denoted
<b>Timing</b>	Long-term (+10 years)

### MUNDIJONG INDUSTRIAL AREA

Approximately 880 industrial lots are proposed in the Mundijong Industrial Area providing a significant opportunity to act as a catalyst for change generating a significant amount of jobs and sustained economic growth. The current West Mundijong Structure Plan provides for a general industrial core (279 ha) and supporting light industrial areas (135 ha) for precincts to the east and south. The light industrial areas also provide separation from the core area to adjoining residential areas to the east and south. Based upon previous work it is likely that the core may support the following forms of industry, subject to approvals:

- + Agribusiness, including abattoirs, food processing, canneries & breweries;
- + General industry, including manufacture / prefabrication of building products and materials;
- + Storage, warehousing, freight and logistics;
- + Heavy machinery servicing and sales; and
- + Transport and fuel depot.

To deliver the above, significant investment into transport infrastructure is required - namely the Tonkin Highway extension and freight rail realignment. These transport connections improve the viability of the industries mentioned above and would enable the establishment of an intermodal hub. Whilst the Shire is committed to industrial development at West Mundijong irrespective of an intermodal facility, the following benefits are acknowledged:

- + 45% cost savings on industrial land over other parts of Perth, greatly reducing investment costs;
- + Strong transport links via rail and road (offering access to major domestic and international markets with just one traffic light routing by the Tonkin Highway);
- + Available industrial land (and surrounding land for associated industrial uses);
- + Rapidly growing population that would double over the next decade and quadruple by 2050;
- + Labour pool of 270,000 potential workers (within a 30 minute drive); and
- + Strong inter-regional road linkages (north-south and east-west).

### EDUCATION AND HEALTH

As the local population continues to grow and evolve, providing access to a range of education and health related facilities locally in the Mundijong District Structure Plan area will become more important.

The Mundijong District Structure Plan proposes a number of new education facilities at all levels including primary, secondary, tertiary (both vocational and university). The establishment of a university campus in the eastern portion of the Mundijong District Structure Plan provides an opportunity to significantly boost the local economy through tangible (immediate jobs growth) and intangible (research and development into emerging industries generating future jobs

growth). In addition, an ageing population will require investment into a range of aged care and retirement living villages to cater for people in all stages of life.

## AGRICULTURE

Whilst opportunities for employment in traditional agriculture are limited within the Mundijong District Structure Plan area, there are opportunities to leverage off existing agricultural cluster and supply chains. Some of these competitive advantages include:

- + Over 15,000 ha of existing agricultural growing areas in the Shire;
- + Strong transport links via rail and road (offering access to major domestic and international markets with just one traffic light routing by the Tonkin Highway);
- + Availability of water (annual average rainfall of 1 metre);
- + Availability of good soils for growing; and
- + Available land in West Mundijong and potentially DIA1 for supporting agri-businesses.

## TOURISM

Tourism is an important component of the Shire's economy. It is an emerging industry and has the potential to create employment opportunities and supports additional recreation options for residents. Almost 200,000 people visit the Shire on an annual basis to enjoy its numerous natural attractions. The Shire also has access to a potential visitor market of 1.9 million people from the surrounding Perth Metropolitan region, which will continue to grow into the future.

The Mundijong District Structure Plan encourages the provision of amenities and facilities including accommodation, dining/entertainment facilities as well as recreation infrastructure, which are vital to supporting the visitor economy from "Sea to Tree". As high-amenity centres, the Whitby and Mundijong District Centre's have the capability to be suitable locations for short-stay accommodation and entertainment for visitors.

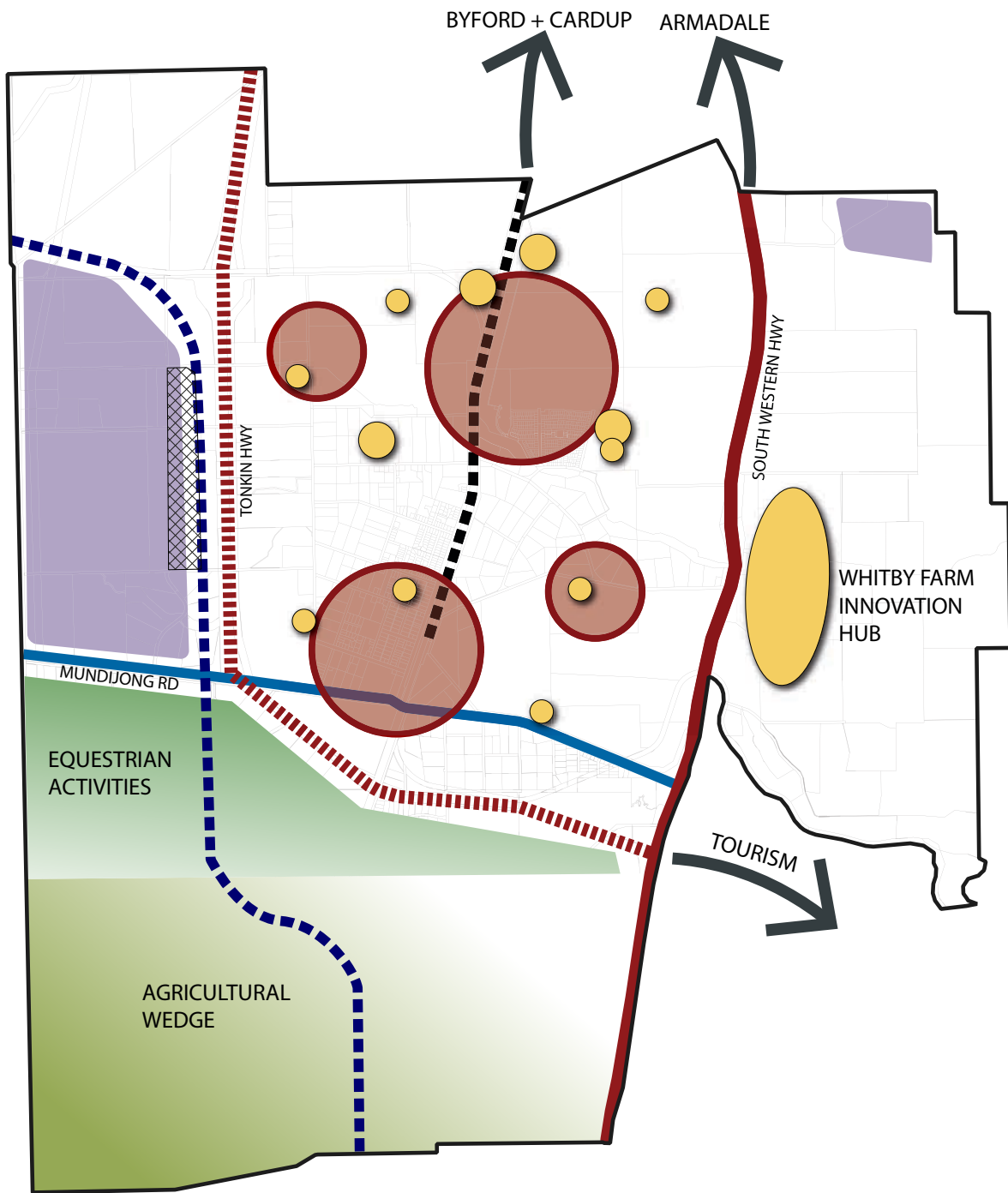
### 3.3.2 EMPLOYMENT

Currently, the estimated resident labour force in the Mundijong District Structure Plan area is 980. With a proposed population of up to 50,000 people the resident labour force is expected to grow exponentially, increasing pressure on the need to provide a significant number of new jobs. The Mundijong-Whitby Activity Centres Background Paper estimated that 60% of Mundijong District Structure Plan residents will be involved in the workforce. Based on an estimated population of 48,500 this would equate to a resident labour force of approximately 29,100.

The South Metropolitan Peel Sub-regional Framework identifies an employment self-sufficiency target of 61% for the eastern sector of the South Metropolitan Peel Sub-Region. Based on an estimated 29,100 resident jobs, the Mundijong District Structure Plan area would need to provide approximately 17,751 jobs to achieve a self-sufficiency rating of 61%. Whilst the industries mentioned in Section 3.3.1 have the potential to provide approximately 10,000 jobs (refer to Appendix 8) achieving an additional 8,000 is unlikely. The Mundijong District Structure Plan has therefore taken a sub-regional focus to employment. Acknowledging that not all jobs can be provided in the local area, the focus is to strengthen transport links particularly those running east-west. This would enable residents in the Mundijong District Structure Plan area to access major employment areas such as Armadale, Rockingham, and Kwinana.



Figure 19: Proposed Employment Generators



Mundijong Education and Employment

Status: Preliminary (not to be used for feasibility purposes)  
Path: Final Development Strategies for Serpentine-Jarrahdale

Scale: 1:5,000 @ A1  
North:

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 29/11/18

**Hames Sharley**

**LEGEND**

- MUNDIJONG DSP BOUNDARY
- INDUSTRIAL
- AGRICULTURAL WEDGE
- EQUESTRIAN ACTIVITIES
- TONKIN HWY
- SOUTH WESTERN HWY
- SECONDARY REGIONAL ROAD
- PASSENGER RAIL LINE
- FREIGHT RAIL LINE
- ACTIVITY CENTRES
- EDUCATION
- INTER-MODAL FACILITY

## 3.4 Movement and Access

The Mundijong District Structure Plan seeks to facilitate an accessible, connected and safe movement network for all modes to service a full range of housing, employment, retail, recreational and community service opportunities. Transport and land use integration will ensure that increased density and activity is focused around an improved public transport network and that connectivity to strategic locations is enhanced. The future intent of the movement network in the Mundijong District Structure Plan area is described below.

To accommodate the anticipated population growth for the Mundijong area and to ensure efficiency of the movement system is not compromised, the Mundijong District Structure Plan recognises the need to integrate urban development and employment nodes with transport infrastructure and services. A challenge for the Mundijong District Structure Plan area is to ensure key roads are appropriately managed and upgraded over time to facilitate future transport efficiency. An effective and adaptable public transport network will be a key mechanism for achieving greater sustainability. This will be achieved through an integrated network of passenger rail lines and transit corridors.

### 3.4.1 PUBLIC TRANSPORT

A key component of providing effective transport connections involves improvements to the provision and frequency of public transport in the Mundijong District Structure Plan area. Improving east-west and north-south public transport connections in the Mundijong District Structure Plan area would significantly improve the public transport network enabling larger portions of the population, including those who do not drive, to access convenient travel options with reduced travel times and less traffic congestion and greenhouse gas emissions.

#### **Rail**

Improvements to rail connections in the Mundijong District Structure Plan will be dependent on outcomes of METRONET. It is acknowledged that Stage 1 METRONET proposals are subject to further investigations. As part of this process, the Mundijong District Structure Plan proposes the following:

- + Passenger rail extension from Byford to the Mundijong with a further train station in the Mundijong Town Centre to improve north-south links; and
- + Identification of rapid transit investigation areas along Mundijong Road and Bishop Road/Gossage Road to provide east-west connections to Rockingham, effectively 'closing the loop'.

All future rail crossings must be grade-separated in line with PTA policy. Throughout the Mundijong Town Centre, the Mundijong District Structure Plan proposes a continuous grade separated section between Mundijong Road and Richardson/Evelyn Street.

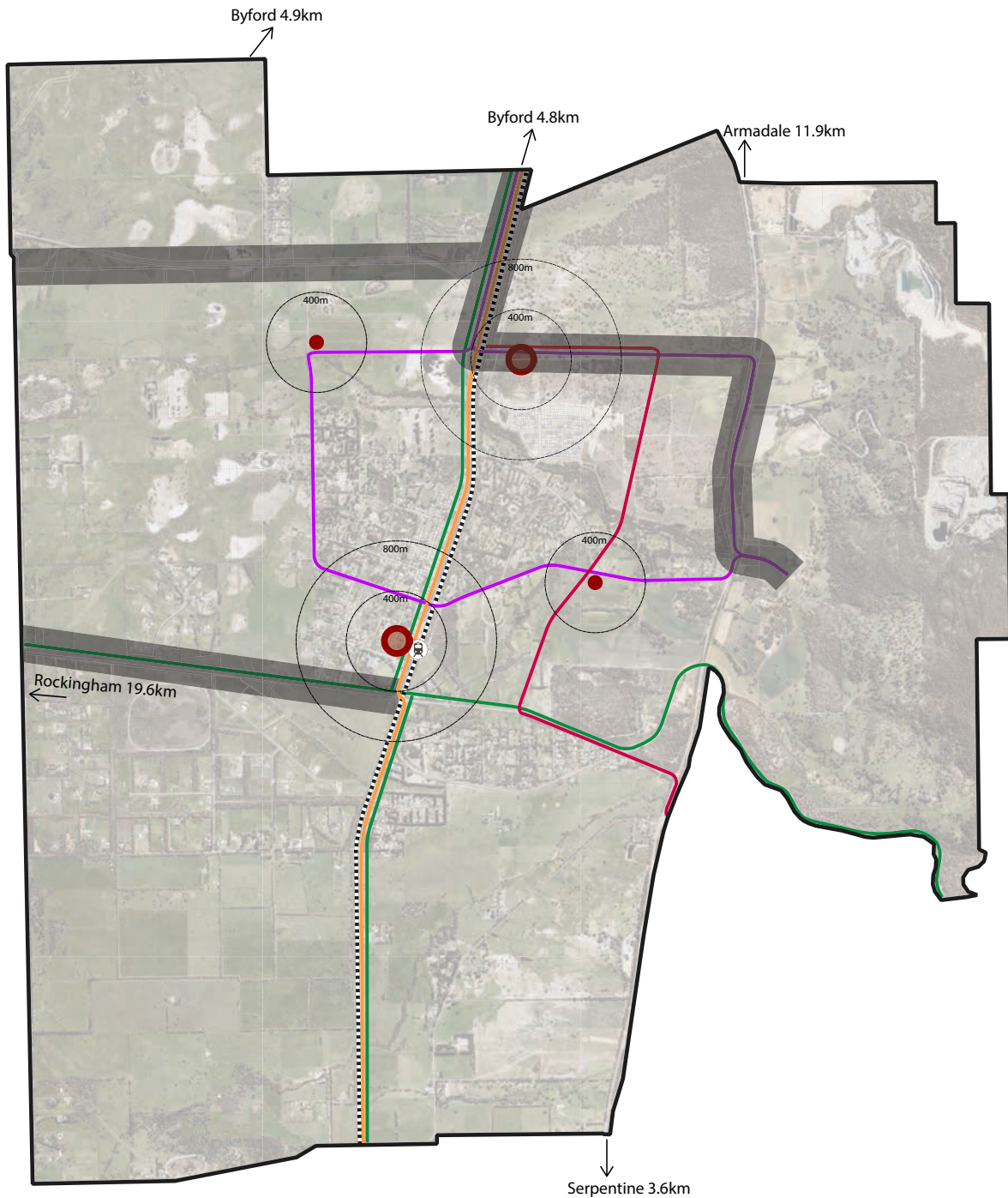
#### **Bus**

While the passenger rail service to Mundijong is highly desirable it is a long-term proposition. In the short-medium term, High Frequency Transit Corridors will be required. These corridors are likely to include Bus Rapid Transit with the view to include rail long-term. High Frequency Transit Corridors will provide public transport connections between the Byford and Mundijong activity centres, population catchments, rail stations and local bus services. These connections will significantly improve the public transport network. The High Frequency Transit Corridors could be established along existing rail corridors; however, they are subject to further investigation with the Department of Transport in order to establish travel patterns. Consideration also needs to be given to the implications of future technological changes in transport including electric and autonomous vehicles, on-demand public transport, car sharing and other changes which could affect the demand for and/or the design of transport infrastructure. Whilst many changes cannot be foreseen, it is extremely important for strategic transport corridors (which are flexible and adaptable) to be established.

### 3.4.2 ACTIVE TRANSPORT

Active modes of transport such as walking and cycling are supported for short distance journeys within urban areas in the Mundijong District Structure Plan. LSP's should support Healthy Active By Design Principles by ensuring that

Figure 20: Proposed Movement Network - Public and Active Transport



Mundijong Proposed Public and Active Transport Network

Status: Preliminary (not to be used for feasibility purposes)  
Path: IP/2018/Development Strategies for Serpentine-Jarrahdale

Scale: 1:15,000 @ A1  
North: [North Arrow]

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 25/10/18



**LEGEND**

- MUNDIJONG DSP BOUNDARY
- RAIL LINE
- PRINCIPLE SHARED PATH
- BUS ROUTE 1
- BUS ROUTE 2
- BUS ROUTE 3
- DISTRICT CENTRE
- NEIGHBOURHOOD CENTRE
- R RAIL STATION
- RAPID TRANSIT INVESTIGATION AREA

all urban areas provide safe, accessible and interconnected pedestrian and cycle links between residential areas and destinations such as activity centres, schools, public transport stops and parks. This will be essential in encouraging greater pedestrian and cycling activity in the Mundijong District Structure Plan area. Such modes of transport have many benefits including improved physical and mental health, activated streetscapes with a higher level of passive surveillance, reduced dependency on the automobile leading to less traffic congestion and greenhouse gas emissions and increased engagement within communities. Facilitating active modes of transport is also important for recreational purposes offering opportunities for jogging, dog walking, horse riding, bushwalking and off- road cycling.

Future detailed planning of the local road network will need to be designed to cater for local trips to support and encourage the use of local businesses and community services. The local road network will need to be easy to use and with direct, safe and well-lit routes to local bus stops and centres. Walking and cycling should be the primary choice for most activities.

### 3.4.3 ROAD NETWORK

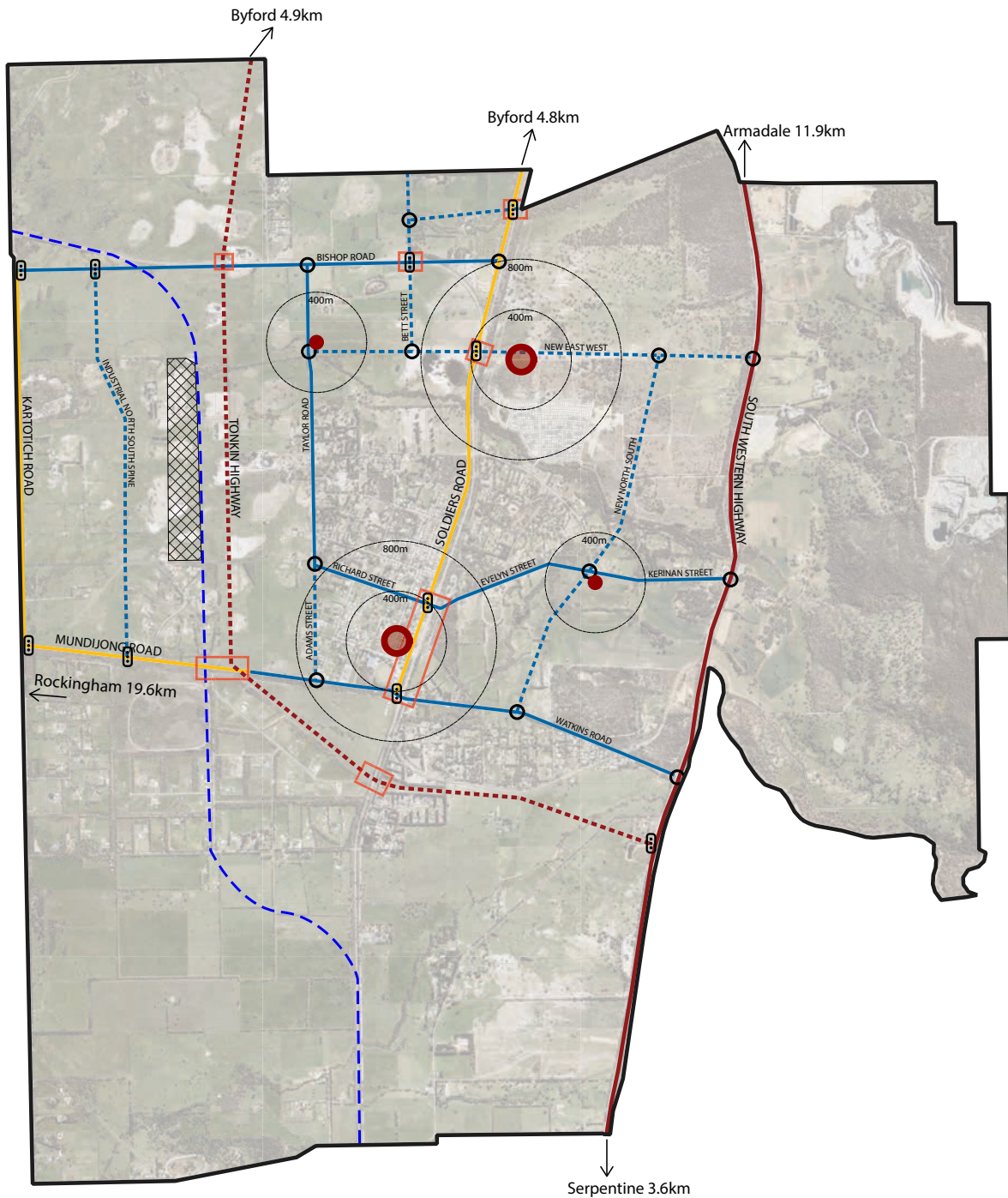
The Mundijong District Structure Plan seeks to align with the South Metropolitan Peel Sub-regional Framework that identifies a number of upgrades to the future regional road network including new and upgraded primary distributor and integrator arterial roads (**Figure 20**). This includes the extension of Tonkin Highway (north-south) and upgrade of Mundijong Road (east-west) which provide vital linkages between the future Kwinana Outer Harbour and freight logistics centres in the region, inclusive of the Mundijong Industrial Precinct.

Good access to and from key distributor roads is an important focus of the Mundijong District Structure Plan and a major consideration for people moving to and within the Mundijong District Structure Plan. New or improved connections to South Western Highway, Tonkin Highway, and Mundijong Road are essential. Some of the proposed road network changes include:

- + Adams Street will be upgraded to a local distributor and a new connection will be provided to Mundijong Road to improve north-south links;
- + Evelyn Street upgraded to local distributor to provide an east-west connection between Richardson Street and Keirnan Street. This will provide a defined connection between Adams Street and South Western Highway through the Mundijong Town Centre;
- + New east-west local distributor road will be provided between Taylor Road and South Western Highway connecting to the Whitby District Centre;
- + New north-south local distributor road (west of South Western Highway) to provide connections between Mundijong Road and the new east-west local distributor;
- + New north-south local distributor between Bishop Road and Mundijong Road through the Mundijong Industrial Precinct;
- + New north-south local distributor to provide eventual extension and connection to Orton Road. Facilitating better connectivity into the Mundijong District Structure Plan area
- + New grade separated intersections on Tonkin Highway at Bishop Road and Mundijong Road;
- + Grade separated rail between Mundijong Road and Richardson Street to facilitate better east-west links for vehicles and pedestrians;
- + Grade separated rail crossing at the new east-west distributor road;
- + Soldiers Road & Town Centre Distributor Road grade separation constructed as one project, with road bridge structures over the single rail line; and
- + Upgrading the Mundijong / Watkins Road existing rail crossing with a future crossing at Galvin Street with grade separation achieved by a rail bridge over the two road crossings.

In addition to the above, a number of existing roads will be upgraded to increase their network capacity. All new connections and upgrades will be funded through the Mundijong Development Contribution Plan.

Figure 21: Proposed Movement Network - Roads and Freight



Mundijong Proposed Roads and Freight Network

Status: Preliminary (not to be used for feasibility purposes)  
Path: P:\2024\Development Strategies for Serpentine-Jarrahdale

Scale: 1:15,000 @ A1  
North

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 25/10/18



**LEGEND**

- MUNDIJONG DSP BOUNDARY
- PRIMARY DISTRIBUTOR
- REGIONAL DISTRIBUTOR
- LOCAL DISTRIBUTOR
- FUTURE PRIMARY DISTRIBUTOR
- FUTURE LOCAL DISTRIBUTOR
- FREIGHT RAIL
- DISTRICT CENTRE
- NEIGHBOURHOOD CENTRE
- ROUNDABOUT
- T TRAFFIC LIGHT
- GRADE SEPERATION
- INTER-MODAL FACILITY

## TRAFFIC IMPACT ASSESSMENT

Cardno prepared a Traffic Impact Assessment (**Appendix 4**) to test the efficiency and performance of the proposed Mundijong District Structure Plan road network.

A mesoscopic traffic model was developed to model the current traffic situation and provide a base to determine the likely future traffic impacts. A number of data sources were used in the formulation of the mesoscopic model which included traffic, surveys, census data and information provided by local authorities. The future-year models are based on the traffic growth scenario derived from information provided by the Shire of Serpentine-Jarrahdale and Main Roads (ROM24 outputs) for the 2031 scenario years.

Based on the results provided by the mesoscopic model, the network for the area of Mundijong is operating at an acceptable level of service with sufficient capacity to accommodate traffic for the 2018 scenario. With respect to the 2031 scenario, the mesoscopic model identified a number of intersections which exhibited capacity or delay issues. These intersections have been assessed in SIDRA to determine the minimum extent of upgrades required to ensure that they are operating at an acceptable level of service in 2031. All intersections were considered to operate at an acceptable level of service, with the exception of two key intersections Mundijong / Kargotich Roads and Bishop Road / New Road.

### Operational Performance

**Figure 22** identifies the results of intersection evaluation across the Mundijong area. Intersections have been classified into 3 groups as described below:

1. Existing Intersection Sufficient: the existing (2018) geometry has been evaluated through the Aimsun mesoscopic model and shown to be sufficient to accommodate future traffic growth.
2. Modified Intersection Sufficient: the Shire's proposed modifications have been evaluated through the Aimsun mesoscopic model and shown to be sufficient to accommodate future traffic growth.
3. Additional Reconfiguration Required: The existing and/or proposed intersection form has been evaluated through the Aimsun mesoscopic model and found to experience excessive congestion or delay. These intersections have been re-evaluated in SIDRA and changes identified to improve operation.

As mentioned above two of the intersections required reconfiguration. The traffic impacts from the Mundijong District Structure Plan were evaluated in a mesoscopic modelling framework. Overall, with the reconfigured intersection forms the SP network is considered to operate satisfactorily in the 2031/future scenario.

Further details on the intersection performance assessment are provided in **Appendix 4**.

### 3.4.4 FREIGHT

Access to regional roads and the freight rail network provides opportunities for industries and businesses in the Mundijong District Structure Plan area to be well connected to markets and suppliers. Improved east-west road links are considered to be essential to support industry and provide access to major freight and logistics hubs such as Fremantle and Kwinana (to the west) and Welshpool/Kewdale, Perth Airport (to the north). The future freight rail network in the Mundijong District Structure Plan area is proposed to deviate to the Mundijong Industrial Area on the western side of the Tonkin Highway extension. This realignment would offer the following benefits:

- + Remove a constraint (boundary, buffer, noise and vibration) to urban development in Mundijong;
- + Support the Mundijong Industrial Area; and
- + Provide an opportunity for an intermodal facility in West Mundijong.

The combination of the freight rail realignment and Tonkin Highway extension provides opportunities to establish an Intermodal Freight Terminal in West Mundijong.

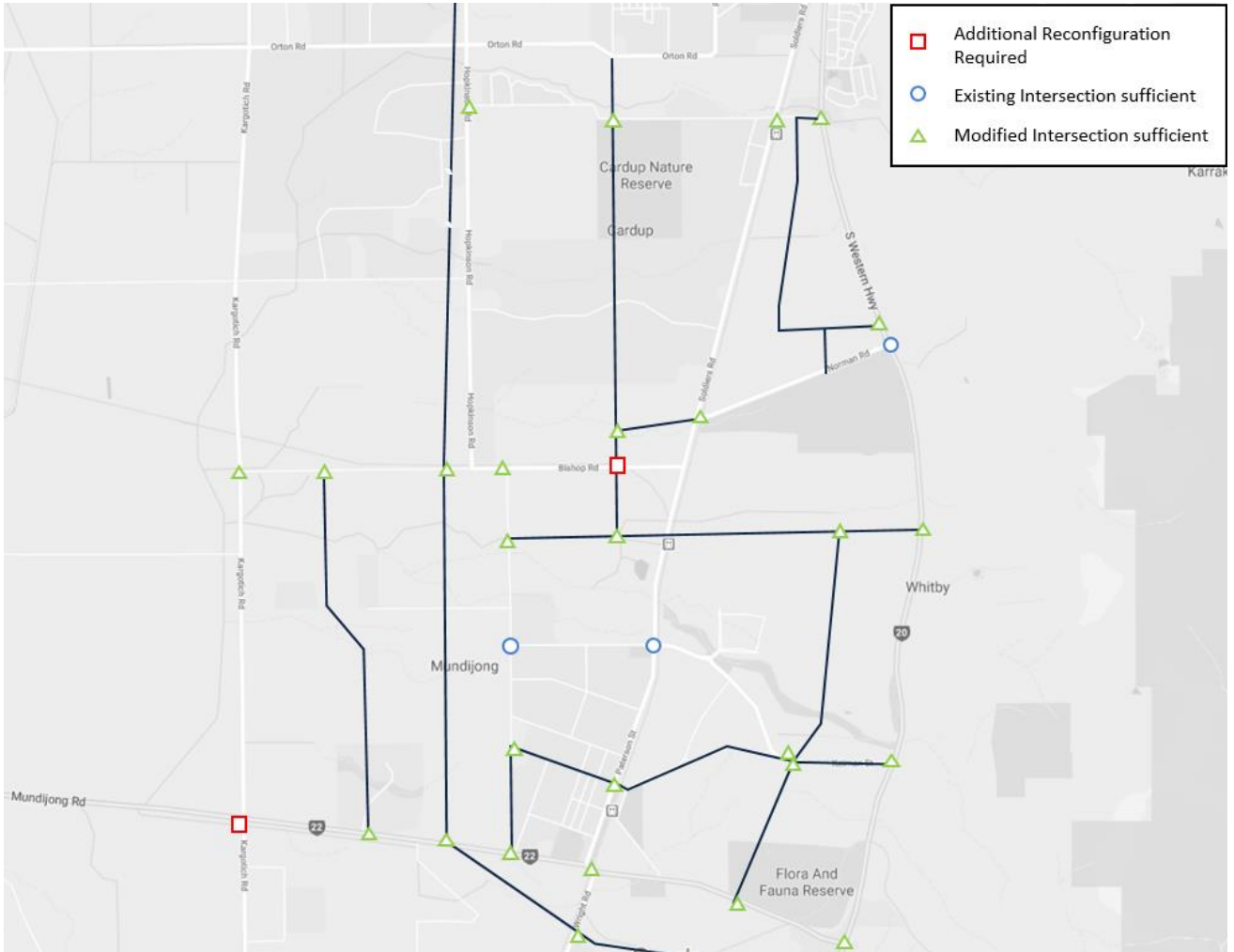


Figure 22: Intersection Sufficiency  
Source: Cardno

## 3.5 Community and Social Infrastructure

The Mundijong District Structure Plan endeavours to provide residents with the opportunity to live balanced, active and healthy lifestyles. They will enjoy good access to health and recreation facilities that promote wellbeing and provide opportunities for both active and passive recreation. Community facilities within the Mundijong District Structure Plan area will have an important role in creating activated community hubs bringing together different groups and individuals. Community and social infrastructure required for the provision of health, education, sport and recreation services in the area will need to accommodate a growing and ageing population.

With regard to community facilities, the focus of the Mundijong District Structure Plan is to make the most efficient use of existing land and infrastructure. This includes the collocation of education and recreation facilities where possible with the intent of reducing traffic movements and establish a greater sense of social cohesion through consolidation of services and activity for nearby residents.

### 3.5.1 EDUCATION FACILITIES

The Mundijong District Structure Plan identifies new education facilities necessary to serve the proposed population. Education requirements in the Mundijong District Structure Plan area have been guided by relevant policy and the requirements of the Department for Education (DoE). The DoE has identified the provision for eight public primary school sites and two public high school, in addition to the existing private high school, as necessary for the Mundijong District Structure Plan area.

The Mundijong District Structure Plan area has one existing primary school, which are to be included within the eight required, and one existing private high schools. The additional primary schools and the new high schools are conceptually shown on the Mundijong District Structure Plan to provide an indication of the expected distribution of school sites to meet catchment requirements across the whole Mundijong District Structure Plan area (**Figure 23**). However, final locations, the size, shape and dimensions of school sites will be confirmed as part of Local Structure Plans and should be determined in accordance with Liveable Neighbourhoods Element 8, and in liaison with the Department of Education.

During preparation of LSP's, proponents are encouraged to consider innovative approaches to integrate school sites and school activities with surrounding residential areas. Shared use of school facilities and/or provision of uses compatible with adjoining residential activities to encourage greater community use of school facilities either as part of educational facilities or an adjoining local node, is encouraged. Facilities including the provision of local convenience shopping or a local café/coffee shop should be investigated as part of local structure planning.

With regard to tertiary education, the Mundijong District Structure Plan identifies the location for vocational studies at a TAFE site north of the Whitby District Centre. It also identifies a future university campus (Murdoch University) at Whitby Falls Farm. The Murdoch University development at Whitby is intended to be a centre for teaching and research in veterinary and agricultural sciences, as well as other disciplines such as environmental science and conservation – all subjects that are admirably aligned to key strengths and characteristics of the Shire area. The site would also include the WA Drone Hub, which is a Regional Development Australia initiative.

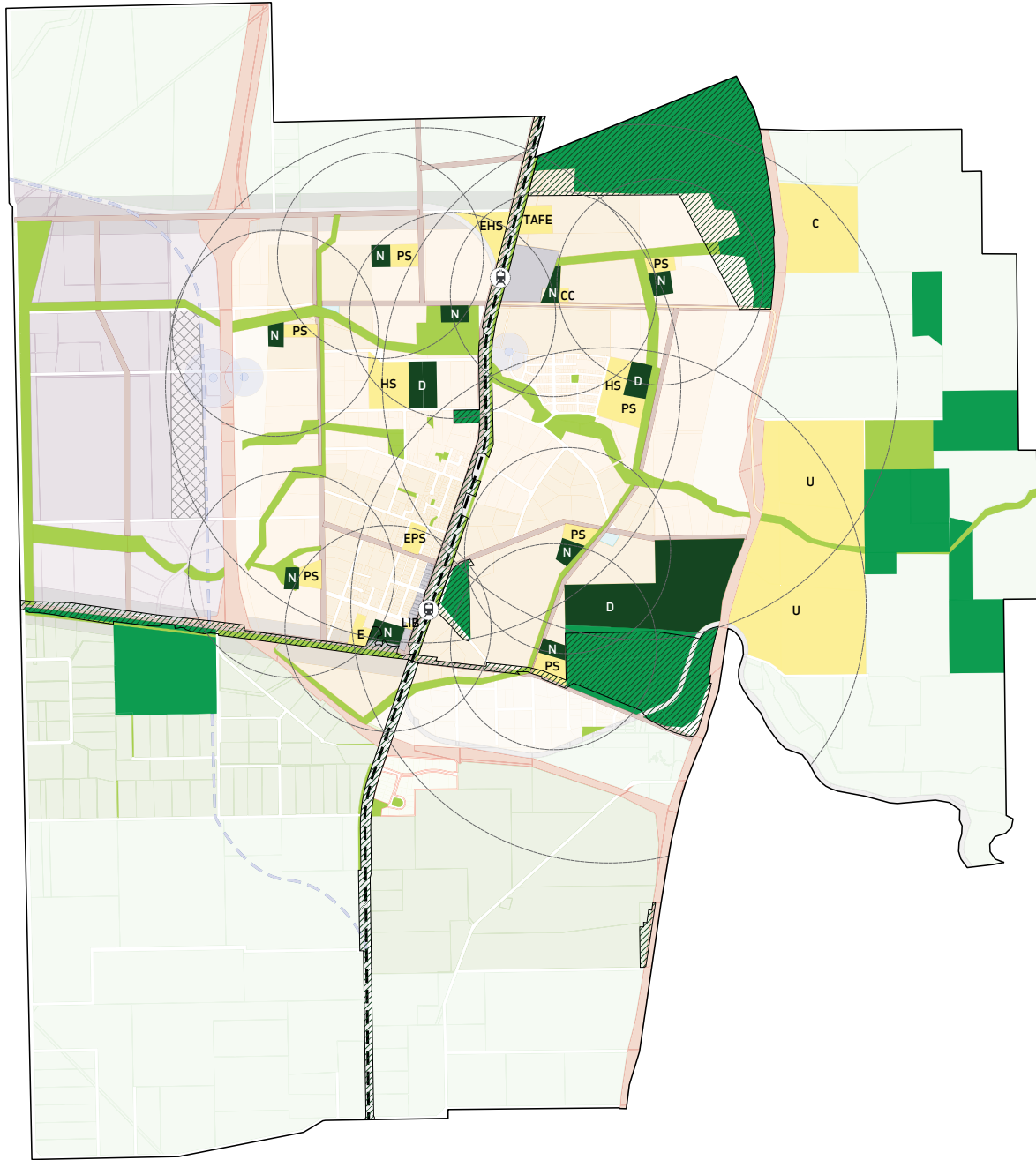
### 3.5.2 PUBLIC OPEN SPACE

The Mundijong District Structure Plan area incorporates a network of well-distributed and connected Public Open Space areas which include a combination of natural reserves, multiple use corridors, dedicated sport and recreation facilities and local parks providing opportunities for both informal and formal recreation.

The Mundijong District Structure Plan proposes to collocate six new primary schools with neighbourhood level open space (provision for 1 oval) and two secondary schools with district level open space (provision for 2 ovals). The ovals at the schools should be at least 205m x 175m in extent with a 4 metre minimum run-off area surrounding. The Mundijong District Structure Plan also identifies a significant district open space area located on Keirnan Street. This facility will have more of a sub-regional focus compared to the other facilities. An overarching concept plan proposes that the facilities will provide for twelve indoor basketball courts, eight tennis courts, sixteen netball courts, parking areas, an aquatic centre



Figure 23: Proposed Community Infrastructure and Open Space Network



Mundijong Environment and Community

Status: Preliminary (not to be used for feasibility purposes)  
Path: P:\2024\Development Strategies for Serpentine-Jarrahdale

Scale: 1:15,000 @ A1  
0 100 200 300 400

North

Project Number: 43874  
Drawing Number: A101  
Revision: A  
Date: 04/12/18



**LEGEND**

- |   |  |     |                         |    |                          |
|---|--|-----|-------------------------|----|--------------------------|
| — | MUNDIJONG DSP BOUNDARY                 | —   | RAIL LINE               | D  | DISTRICT OPEN SPACE      |
| ▨ | BUSH FOREVER                           | 🚂   | TRANSIT NODE            | N  | NEIGHBOURHOOD OPEN SPACE |
| 🟢 | MULTIPLE USE CORRIDOR/LOCAL OPEN SPACE | EHS | EXISTING HIGH SCHOOL    | E  | EMERGENCY SERVICES       |
| 🟠 | RESERVE                                | EPS | EXISTING PRIMARY SCHOOL | C  | CEMETERY                 |
| 🟤 | DISTRICT/NEIGHBOURHOOD OPEN SPACE      | HS  | HIGH SCHOOL             | U  | UNIVERSITY               |
| 🟡 | COMMUNITY PURPOSE                      | PS  | PRIMARY SCHOOL          | CC | COMMUNITY CENTRE         |
|   |  | LIB | LIBRARY                 | ○  | 800M/2KM CATCHMENT       |

and a BMX track. The site is strategically located in the centre of the Shire, allowing associated community infrastructure to form shire-wide facilities and the site to function as a recreation precinct for the whole Shire. The Community Infrastructure Development Contribution Plan provides further information in this regard.

### SIZE AND DISTRIBUTION OF PUBLIC OPEN SPACE

**Figure 23** illustrates the location and distribution of open space throughout the Mundijong District Structure Plan area. The Mundijong District Structure Plan makes provision for a network of district and neighbourhood level open space areas. The respective sizes are in accordance with Liveable Neighbourhoods, 1 ha – 5ha for neighbourhood and >5ha for district. It is expected that smaller local parks will be provided for at the LSP stage.

For future development a 10% Public Open Space contribution will be required. This is to be calculated on the basis of 10% of purely residential designated land use only. Deductions from the total site area to determine the gross subdivisible area include all non-residential land uses that do not generate the need for a contribution to Public Open Space, and for which a Public Open Space allowance has not been sought.

The 10 per cent Public Open Space requirement allows for the provision of a maximum of 2 per cent of restricted use Public Open Space as outlined within Liveable Neighbourhoods. Resource enhancement wetlands and buffers to environmentally sensitive areas are not deemed Public Open Space for 'recreation' purposes, however, in some cases it is acceptable for the land to be utilised and accessed by the community and therefore deemed to be 'restricted use'. These areas must have an approved management plan to manage impact and enhance the environmental values of the area. Areas of remnant vegetation are to be protected from subdivision and development and therefore may also be included within the 10% Public Open Space contribution.

#### Variations to 10 per cent public open space contribution

A contribution of more or less than 10 per cent of the gross subdivisible area may be considered, or is needed where the area is subject to particular circumstances or when it is more appropriate to apply an alternate cash-in-lieu contribution instead of provision as outlined within the Liveable Neighbourhoods Element 5 Public Open Space.

In some instances, additional land over and above the standard 10% Public Open Space requirement, may be required to be provided at the time of subdivision and/or development to accommodate drainage, recreational, environmental or other similar functions. Such land may be required to be provided free of cost at the time of subdivision and/or development.

An indicative schedule of deductions for the purposes of calculating Public Open Space is provided in the following section.

### INDICATIVE PUBLIC OPEN SPACE SCHEDULE

In residential areas 10 per cent of the gross subdivisible area must be provided free of cost by the subdivider and vested in the Crown under the provisions of Section 152 of the Planning and Development Act 2005 for Public Open Space and foreshore management purposes.

For the purposes of calculating the 10% POS requirement at LSP stage, the following indicative POS schedule is recommended:

#### Calculation of Required Public Open Space Provision:

- a. The total site area, less deduction resulting in the Gross Subdivisible Area (GSA):

**Less:** Non residential land uses (including Commercial, Mixed Use, School Sites, Utility and infrastructure facilities); and Multiple Use Corridor (including Urban Water Management and vegetation protection components as determined under District and Local Water Management Strategies)

**Leaves:** Net residential development area

- b. The GSA (total site minus deductions) - divided by 10% equals the required Public Open Space provision requirement

**Breakdown of Public Open Space Provided within LSP areas:**

- c. The total restricted Public Open Space – to a maximum of 20%
- d. Added to the total unrestricted Public Open Space: by function – identified as a percentage of the Gross Subdivisible Area

In accordance with WAPC requirements, residential components of mixed use developments will be included within the net residential development area for the purposes of calculating the Public Open Space requirement.

## 3.6 Environment and Landscape

The natural areas and environmental quality of the Mundijong area enhances amenity and creates character within both urban and rural areas. It is important for this purpose to ensure that the natural environment is preserved and enhanced as a central element of liveability and a defining characteristic of the Mundijong District Structure Plan area. The challenge for the Mundijong District Structure Plan area will be to retain or create a 'sense of place' by maintaining key individual landscape characteristics and vistas in areas that will be subject to large-scale landscape change. Consideration must also be given to minimising the impact on existing natural waterway remnant vegetation within these ecological corridors.

### 3.6.1 MULTIPLE USE CORRIDORS

The Mundijong District Structure Plan area contains a number of important natural features including creeks and drainage lines, which in accordance with the Shire's sustainability philosophies, are to be preserved as part of the planning and development of Mundijong. The main creek/drainage alignments are identified within the District Structure Plan as part of the linear park Multiple Use Corridors (MUC's).

The exact size and dimension of the MUC's are to be determined at LSP stage based upon the requirements of District and Local Water Management Strategies prepared in accordance with appropriate policy. Where land is to be accommodated within MUC's for Urban Water Management or vegetation/wetland preservation purposes this shall be provided in addition to the standard 10% public open space provision. Where land is included as part of a MUC for active or passive public open space purposes, then that area can be considered as part of the 10% public open space provision. A minimum of 10% of the developable area will be required to be provided and will be confirmed at LSP stage. This calculation should be included in the public open space schedule submitted with every LSP.

### 3.6.2 PROTECTION OF NATURAL AREAS

Retaining and enhancing vegetation in the Mundijong location is critical to maintaining the desirability, amenity and sustainability of the district. The Mundijong District Structure Plan identifies locally significant natural areas that may be retained as part of local open space and dealt with through the LSP process. Throughout the Mundijong District Structure Plan area, there are several avenues of trees established along rural roads and driveways. Where possible, the LSP's should retain this vegetation and take the opportunity to do this in open space or within new road reserve verges.

Further, conservation corridors and multiple use corridors will enable district significant areas to be retained and enhanced. Where LSP's are affected by Bush Forever, conservation corridors or multiple use corridors, management plans will need to be prepared and implemented in order to provide for ongoing health and viability. The design of Local Structure Plans should demonstrate the preservation of as much locally significant and native vegetation within the urban fabric as possible.

## 3.7 Service Infrastructure

The Sub-regional Planning Framework identifies future conceptual water supply planning for the in the eastern sub-regional sector where major water storage reservoirs will be necessary in the escarpment near Byford Tank (Byford) and Mundijong Reservoir (Jarrahdale) to serve long-term urban development in these areas (WAPC, 2018).

The Shire is also committed to investigating alternative sources of water management and exploring options beyond business as usual. The approach to integrated water cycle management will entail the conceptualisation and assessment of alternate schemes supplying water of appropriate quality for various Non-Drinking Water (NDW) purposes to ensure equitable outcomes for new development within the Mundijong District Structure Plan area.

The Mundijong District Structure Plan identifies three wastewater pump stations necessary for the future population. These are described as follows:

- + Wastewater Pump Station 1: Type 500 facility, located on eastern side of Soldiers Road in Whitby;
- + Wastewater Pump Station 2: Type 500 facility, located in north-eastern sector of Mundijong District Structure Plan area on eastern side of Tonkin Highway; and
- + Wastewater Pump Station 3: Type 1000 facility, located in north-eastern sector of Mundijong District Structure Plan area on western side of Tonkin Highway.

The Mundijong District Structure Plan bases its Servicing requirements on the Infrastructure and Services Study carried out by Parson and Brinckerhoff, peer reviewed by Sinclair Knight Merz Servicing study conducted for the Mundijong-Whitby District Structure plan. This has been enhanced through further studies done for Local Structure Planning done in Mundijong Precincts A, E and G and further discussions with the State Servicing Agencies during the pre-consultation process.

As the development in the Mundijong District Structure Plan area generally is "greenfields" of nature and only bulk infrastructure is available, Local Structure Planning should address the provision of electricity, water and wastewater.

## 3.8 Heritage and Culture

The character of a place is closely linked to its heritage and it is therefore crucial that elements of heritage, such as the built form, mature trees and local landscape are preserved and incorporated into any new development.

### 3.8.1 NON-ABORIGINAL HERITAGE

The Mundijong District Structure Plan area contains a number of non-aboriginal heritage places and landscapes that need to be preserved for future generations. Opportunities exist for the adaptive reuse of these heritage places, as well as the inclusion of underutilised spaces which can add to and benefit from existing heritage value and character within areas of new development.

In addition to designated heritage sites identified in **“Figure 15: Existing Heritage Places”** on page 74, the character of unique areas such as the Whitby Falls Farm and Manjedal Brook Reserve will need to be preserved as these areas reflect the rural character of the Mundijong District Structure Plan area. Preparation of local planning policies or design guidelines which provide statutory guidance are recommended.

### 3.8.2 ABORIGINAL HERITAGE

As discussed in section 2.2.8 of this report, the Department of Planning, Lands and Heritage (DPLH) has identified Aboriginal Heritage Places in the Mundijong District Structure Plan area. Prior to construction of individual developments, assessment should be undertaken by a qualified consultant to determine whether a more thorough Aboriginal Heritage investigation of the area needs to be undertaken for any specific location to identify unregistered sites



# 4.0 APPENDICES



## 4.1 References

- AEC Group, 2016. Socio-Economic Profile Shire of Serpentine Jarrahdale, Prepared for the Shire of Serpentine Jarrahdale, Mundijong.
- Burra Charter, 2013. The Australia ICOMOS Charter for Places of Cultural Significance, Australia. ICOMOS Incorporated, Victoria.
- Cardno, October 2017. Road Hierarchy Strategy, Prepared for the Shire of Serpentine Jarrahdale, Mundijong.
- Cardno, August 2017. Mundijong Whitby Railway Grade Separation, Prepared for the Shire of Serpentine Jarrahdale, Mundijong.
- Department of Transport, 2015. Transport @ 3.5 Million – Perth and Peel Transport Plan for 3.5 million people and beyond, Department of Transport, Perth.
- Environmental Protection Authority (EPA), 2004. Revised draft environmental protection (Swan Coastal Plain wetlands) policy 2004, Perth.
- Essential Environmental, 2016. Shire of Serpentine Jarrahdale Environmental Profile, Prepared for the Shire of Serpentine Jarrahdale Mundijong.
- GHD, 2016. Mundijong–Whitby District Structure Plan Railway Crossing Considerations. Prepared for Shire of Serpentine Jarrahdale, Mundijong.
- MacroPlan, 2012. Activity Centre Strategy, Prepared for the Shire of Serpentine Jarrahdale, Mundijong.
- McKay, Malcolm 2009, Mundijong Whitby Enquiry by Design Outcomes Report V4. Prepared for the Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, August 1989. Town Planning Scheme No. 2, and associated amendments., Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, November 2016. Draft Local Planning Scheme No. 3, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, November 2016. Draft Local Planning Strategy, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, November 2016, SJ 2050 Vision, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, 2013. Rural Strategy Review, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, December 2016. Community Infrastructure and Public Open Space Strategy, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, August 2017. Community Infrastructure Implementation Plan, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, November 2017. Economic Development Strategy 2018-2023, Prepared for Shire of Serpentine Jarrahdale by Lucid Economics, Mundijong.
- Shire of Serpentine Jarrahdale, 2016. Health and Wellbeing Strategy, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, February 2013. West Mundijong Industrial Area District Structure Plan Report, Shire of Serpentine Jarrahdale, Mundijong.
- Shire of Serpentine Jarrahdale, August 2011. Mundijong–Whitby District Structure Plan. Prepared for Shire of Serpentine Jarrahdale by Masterplan WA, Mundijong.
- Shire of Serpentine Jarrahdale, January 2016. Mundijong–Whitby District Structure Plan Amendment #2: District Road
- SMEC, April 2009. Environmental Study for Mundijong /Whitby District Structure Plan, Prepared for Shire of Serpentine Jarrahdale, Mundijong.
- Network, Justification Report. Prepared for Shire of Serpentine Jarrahdale, Mundijong.



Western Australian Planning Commission (WAPC), 2018. South Metropolitan Peel Sub-Regional Planning Framework, WAPC, Perth.

Western Australian Planning Commission (WAPC), 2015 (Draft). Liveable neighbourhoods, WAPC, Perth.

Worley Parsons, 2016. Mundijong Rail Realignment Cost Feasibility Report. Prepared for Shire of Serpentine Jarrahdale, Mundijong.

### State Planning Policies

A full current list of State Planning Policies can be accessed via the Shire of Serpentine Jarrahdale website << <https://www.planning.wa.gov.au/state-planning-framework.aspx#State-Planning-Policies>>> (accessed 18 March 2018)

### Local Structure Plans

A full current list of local structure plans can be accessed via the Shire of Serpentine Jarrahdale website << <http://www.sjshire.wa.gov.au/what-we-do/planning-and-building/structure-plans/>>> (accessed 15 November 2017)

## 4.2 Technical Appendices

The Mundijong District Structure Plan was prepared with reference to the following technical appendices (provided in separate attachments).

- + Appendix 1 - Mundijong Engagement Report, 2018
- + Appendix 2 - Mundijong-Whitby DSP Environmental Study, 2009
- + Appendix 3 - Mundijong-Whitby District Water Management Strategy, 2010
- + Appendix 4 - Mundijong-Whitby DSP Traffic Impact Assessment, 2007
- + Appendix 5 - Mundijong-Whitby DSP Railway Crossing Study, 2016
- + Appendix 6 - Mundijong-Whitby DSP Railway Crossing Review, 2017
- + Appendix 7 - Mundijong-Whitby DSP Infrastructure and Services Strategy, 2017
- + Appendix 8 - Mundijong-Whitby DSP Activity Centres Background Paper, 2010
- + Appendix 9 - Mundijong-Whitby Water Strategy, 2012
- + Appendix 10 - West Mundijong Industrial Area Bushfire Management Plan



# Transport Impact Assessment

## Mundijong Structure Plan

CW1039600



Prepared for  
Shire of Serpentine Jarrahdale

5 December 2018

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- Appendix A** WAPC Checklist  
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# 1 Introduction

## 1.1 Background

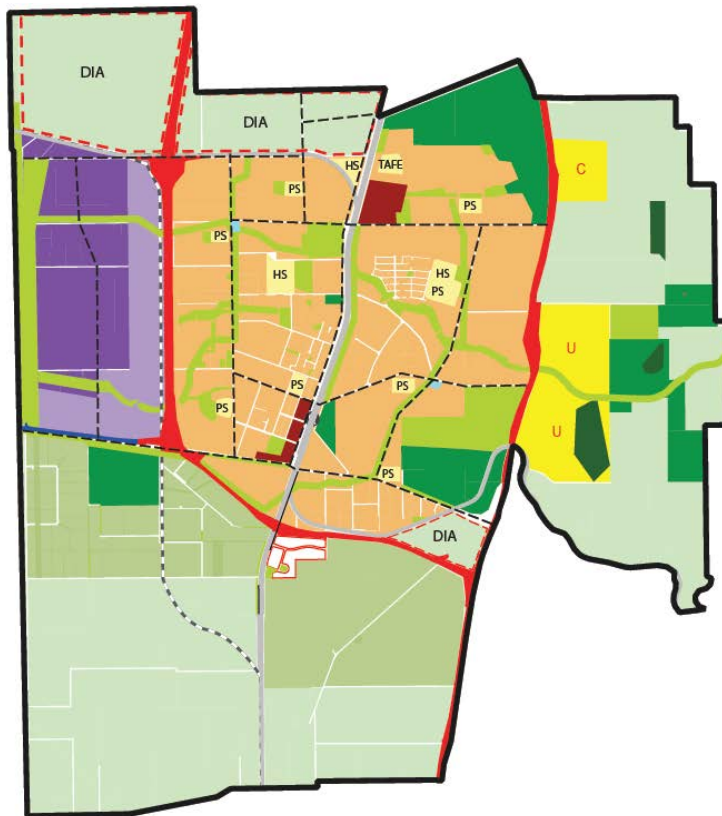
Cardno was commissioned by the Shire of Serpentine to prepare a Transport Impact Assessment for the proposed Mundijong Structure Plan ('the Site' or 'the Structure Plan').

This report has been prepared in accordance with the Western Australian Planning Commission (WAPC) *Transport Impact Assessment Guidelines Volume 2 – Planning Schemes, Structure Plans & Activity Centre Plans (2016)*. This report will support the detailed structure planning for the locality by evaluating the sufficiency of existing and proposed intersection treatments across the Structure Plan Area.

## 1.2 Site Location and Description

The suburbs in the Shire of Serpentine Jarrahdale include Byford, Mundijong, Serpentine, Jarrahdale and Keysbrook. The Site covers Mundijong, in the Shire of Serpentine Jarrahdale on the outer south eastern area of Perth with a population of 2,003 as of 2017 and with a density of 0.44 persons per hectare. The land area of Mundijong is 4,502 hectares most of which is classified as rural and rural residential. **Figure 1-1** shows the location of the structure plan and **Figure 1-2** shows the Study Area.

Figure 1-1 Structure Plan Location



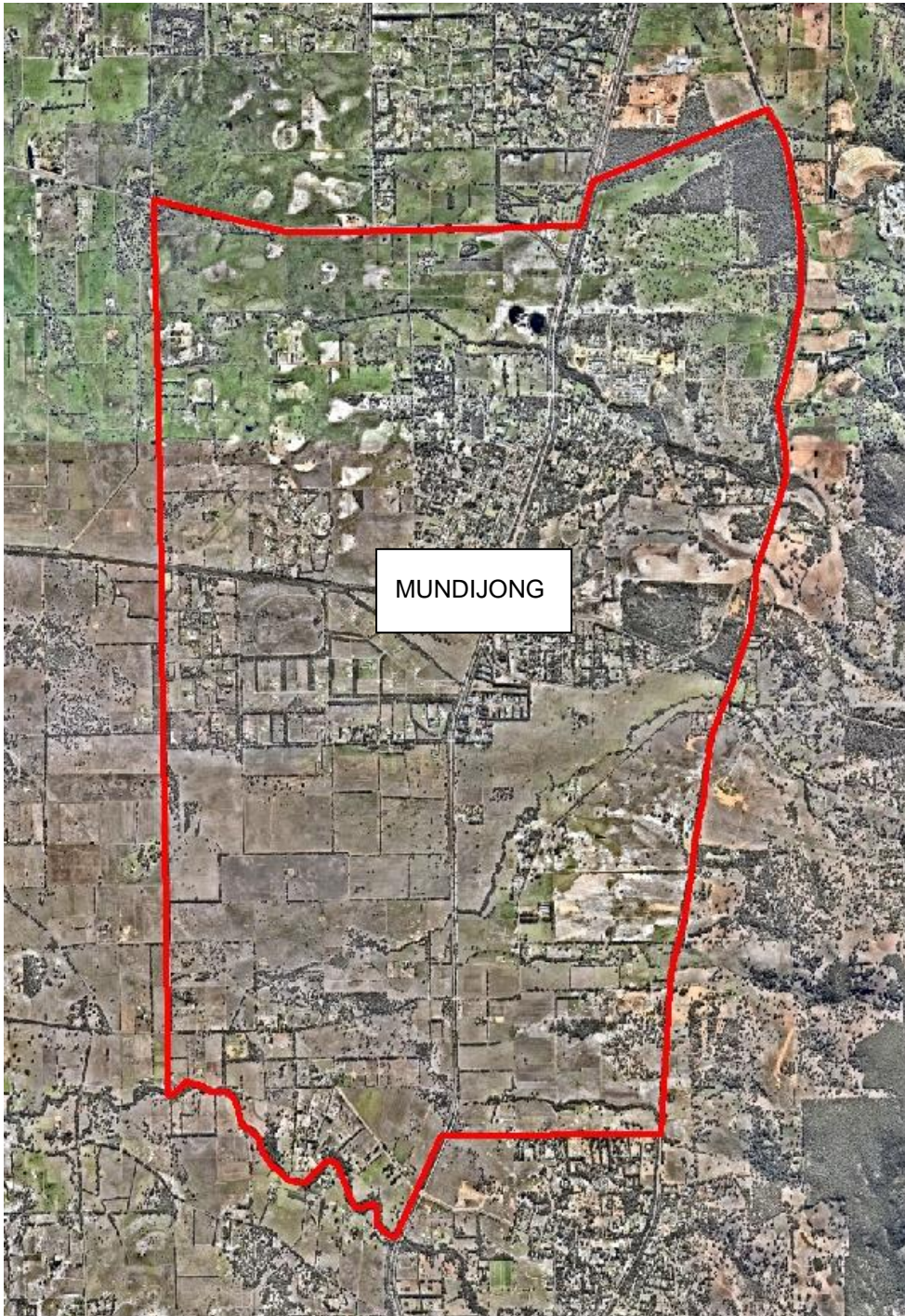
Note: Not to scale.

**LEGEND**

- |   |   |   |
|---|---|---|
| <ul style="list-style-type: none"> <li>— District Structure Plan Area</li> <li>■ District Centre</li> <li>■ Neighbourhood Centre</li> <li>■ Schools</li> <li>■ Public Purpose</li> <li>■ Light Industrial</li> <li>■ Industrial</li> <li>■ Mixed Business &amp; Industrial Park</li> <li>■ Highway Commercial</li> <li>■ Reserve/ Bush Forever</li> </ul> | <ul style="list-style-type: none"> <li>■ Conservation</li> <li>■ Public Open Space/ Green Linkage</li> <li>■ State Forest</li> <li>■ Rural</li> <li>■ Rural Small Holdings</li> <li>■ Urban Settlement</li> <li>■ Special Residential</li> <li>■ RR-1</li> <li>■ RR-2</li> <li>■ Special Use</li> </ul> | <ul style="list-style-type: none"> <li>--- Railway</li> <li>● Rail Station</li> <li>■ Primary Distributor</li> <li>■ Secondary Distributor</li> <li>■ District Distributor</li> </ul> |
|---|---|---|
- PS - Primary School  
 HS - High School  
 DIA - Development Investigation Area  
 REI - Rural Enterprise Investigation

Source: MDSP

Figure 1-2 Study Area



Source: Nearmap



### 1.3 Land Use Proposal

The focus is on the development of land within close proximity of key public transport networks such as development of Mundijong Town Centre as the 'Governance Precinct' and growth of the Whitby town centre as a 'Retail Centre'.

The industrial area is expected to facilitate the increased agriculture related industries including transport and logistics.

Assessment of the impacts of development growth both within and beyond the Mundijong Structure Plan area has been facilitated through Main Roads' ROM24 strategic model. This model relies on land use projections provided by Local and State Government agencies to generate vehicle trips across the network. Cardno has endeavoured to ensure that the land uses defined in ROM24 within the Study Area are consistent with the Shire's anticipated development horizon.

It is acknowledged that full build-out of this land area may not be achieved within the 2031 horizon, which is the only ROM24 time scale currently supplied by Main Roads WA. As such, the ROM24 outputs used as the basis of this TIA have been used to establish an anticipated development and traffic scenario at the point when build-out of the Shire's development planning is achieved.

#### 1.3.1 Key Issues

Some of the main issues and constraints identified are as follows:

- > Lack of housing
- > The railway line acts as a barrier, limiting connectivity between the eastern and western sections.
- > Limited connectivity through rail line
- > Traffic issues that do not assist active transport modes.
- > Lack of public transport between activity centres and regional destinations.

## 2 Existing Situation

### 2.1 Existing Land Uses

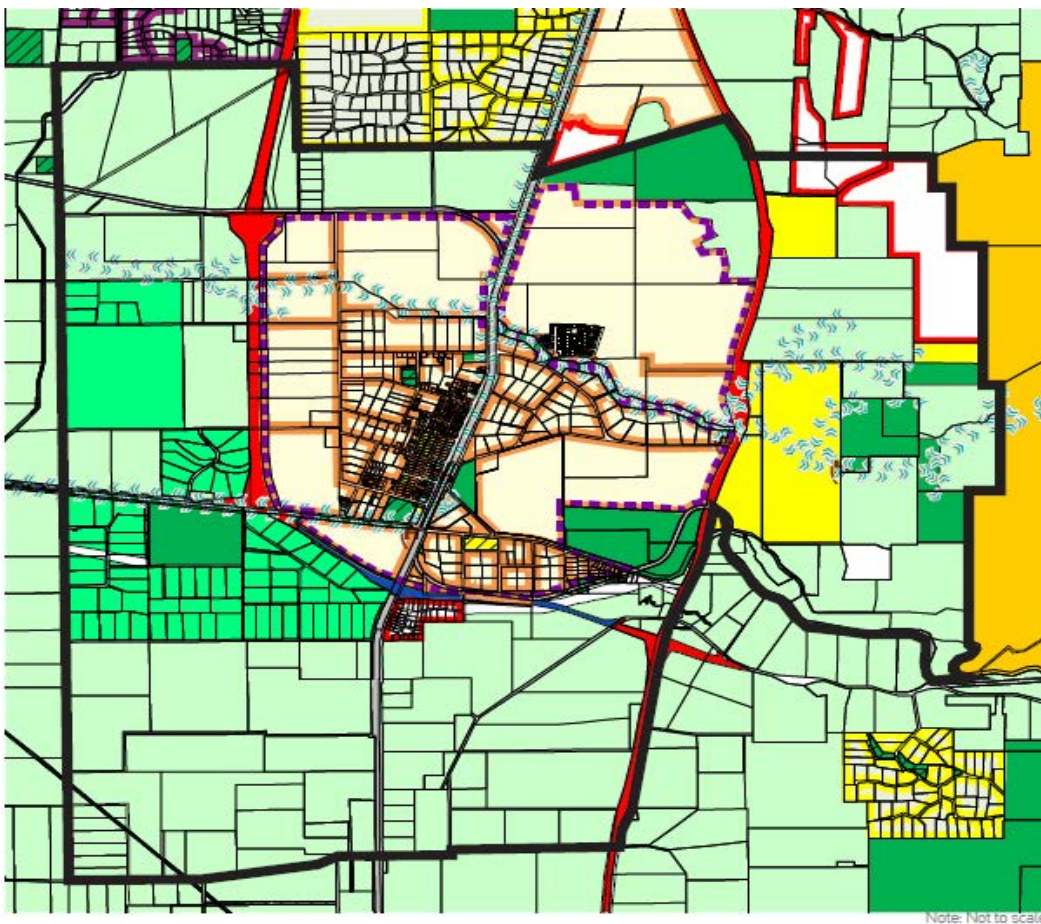
Currently neighbourhood centres are located in the Mundijong town centre and a significant portion of the shire contains rural areas which are in many of the undeveloped areas.

The industrial area lies on the western side of Mundijong and is zoned as 'Industrial Development', this area consists of approximately 440 hectares and is intended for up to 880 industrial lots.

The Mundijong District Structure Plan covers 5,461 hectares of area of which predominant area is zoned for future urban development.

**Figure 2-1** shows the existing zoning under the town planning scheme, evidently the main core of Mundijong consists mainly of urban development and the surrounding area consist largely of rural and farmland areas with some commercial areas along Mundijong Road.

Figure 2-1 Existing Zoning



<b>LOCAL SCHEME ZONES</b> (see scheme text for additional information)		HP Special use - Historic precinct	DA1 Development area
Commercial		LP Special use - Landscape protection	DCA1 Development contribution area
Conservation		TM Special use - Timber mill	EC1 Environmental conditions
F Farmland		Urban development	Jamehdale heritage precinct
Residential			Jamehdale townscape precinct
Rural			PF Poultry farm special control area
Rural groundwater protection			Historic/scientific building or object
A Rural living A			
B Rural living B			
Showroom/warehouse			
Special residential			
Special rural			
Special use			
SU Special use - Concrete casting operations			
CL Special use - Conservation living			
EHR/LF Special use - Extraction/storage sand/rock/leachfill			
ESC Special use - Extraction/storage shale and clay			
ESCLF Special use - Extraction/storage shale and clay/leachfill			

<b>OTHER CATEGORIES</b> (see scheme text for additional information)	
Scheme boundary	
Local Government boundary	
Armedale Redevelopment Area	
R20 R Codes	
A1 Additional uses	
RLA1 Rural living A	
SRes1 Special residential area	
SR1 Special rural area	
H7 Area of historical interest	
NB Area of natural beauty	

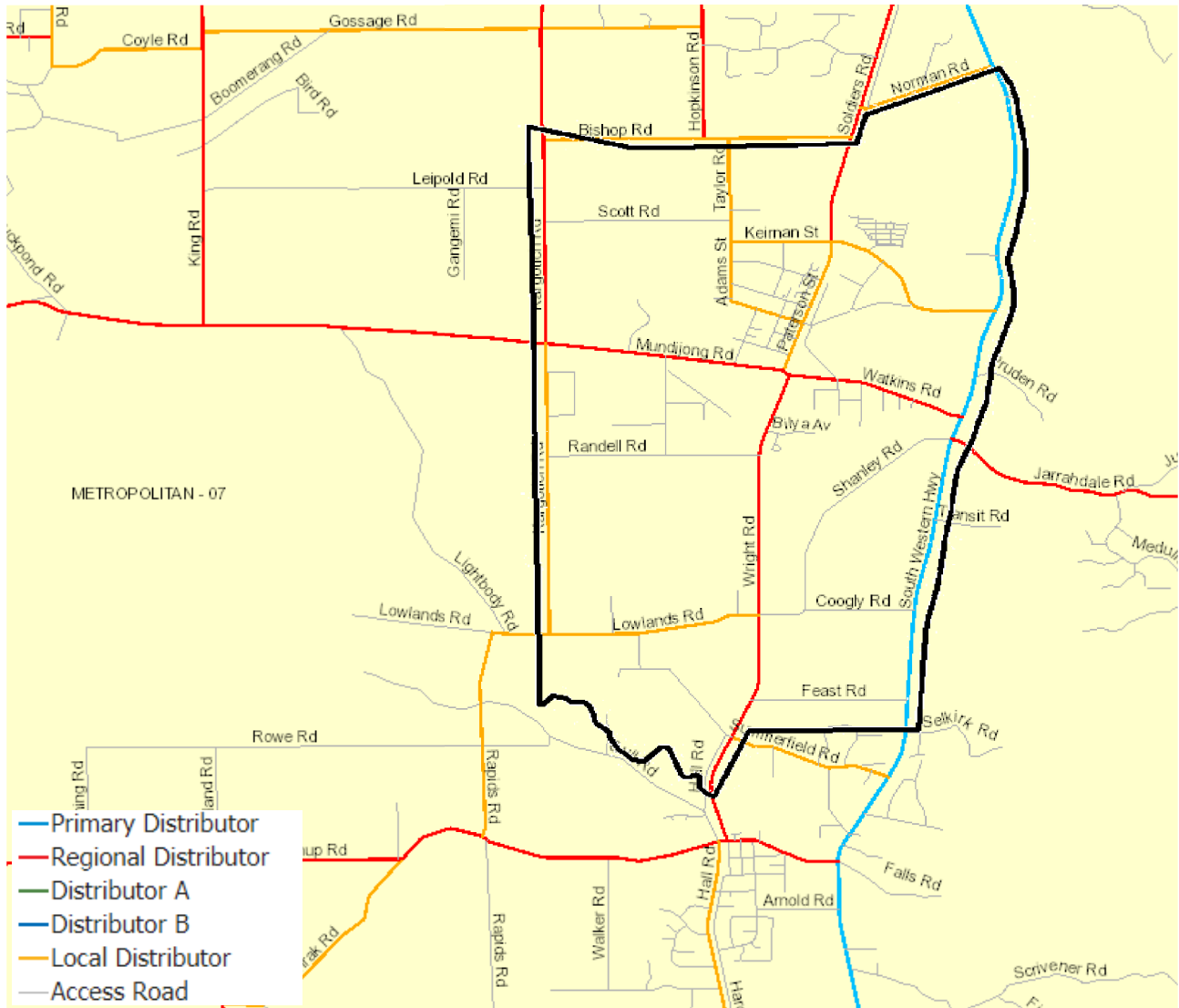
Source: Local Planning Scheme

## 2.2 Existing Road Network

The existing road network surrounding and within the LSP is shown in **Figure 2-2**. Road classifications are defined in the Main Roads Functional Hierarchy as follows:

- > **Primary Distributors (light blue):** Form the regional and inter-regional grid of MRWA traffic routes and carry large volumes of fast-moving traffic. Some are strategic freight routes, and all are National or State roads. They are managed by Main Roads.
- > **Regional Distributors (red):** Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by Local Government.
- > **District Distributor A (green):** These carry traffic between industrial, commercial, and residential areas and connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property. They are managed by Local Government.
- > **District Distributor B (dark blue):** Perform a similar function to “District Distributor A” but with reduced capacity due to flow restrictions from access to and roadside parking alongside adjoining property. These are often older roads with traffic demand in excess of that originally intended. District Distributor A and B roads run between land-use cells and not through them, forming a grid that would ideally be around 1.5 kilometres apart. They are managed by Local Government.
- > **Local Distributors (orange):** Carry traffic within a cell and link District Distributors at the boundary to access roads. The route of the Local Distributor discourages through traffic so that the cell formed by the grid of District Distributors only carries traffic belonging to or serving the area. These roads should accommodate buses but discourage trucks. They are managed by Local government.
- > **Access Roads (grey):** Provide access to abutting properties with amenity, safety and aesthetic aspects having priority over the vehicle movement function. These roads are bicycle and pedestrian friendly. They are managed by Local government

Figure 2-2 Existing Road Network



Source: Main Roads WA

The following discusses the characteristics of the road network surrounding the Structure Plan.

- > **South Western Highway** is classified as *Primary Distributor* with a posted speed limit that varies from 70 km/h from Hobbs Dr to Rails Crescent, to 90 km/h from Mitchell Street to Thomas Rd then to 60 km/h from Thomas Road to Abernethy Road. This road lies to the east of the study area.
- > **Mundijong Road/ Watkins Road** is classified as a Regional Distributor with a posted speed limit of 100km/h.
- > **Bishop Road/Norman Road** is classified as a Local Distributor with a posted speed limit of 50km/h.
- > **Kargotich Road** is classified as a Regional Distributor with a posted speed limit of 90km/h up to Mundijong Road after which it is classified as a Local Distributor with a posted speed limit of 100km/h.

### 2.3 Existing Traffic Volumes

Traffic surveys were conducted on numerous locations within the Mundijong area. The results of these traffic counts are provided in **Appendix B**.

## 2.4 Existing Pedestrian / Cycle Network

Existing pedestrian and cycle network is very limited due to the rural nature of the area. Active modes of transport such as walking and cycling are currently available for short distance journeys within the urban areas. There are several opportunities for network improvements to address existing issues of disconnected streets, lack of footpaths, unsafe routes and long distances.

Figure 2-3 shows the existing pedestrian and cycle facilities within the Study Area.

Figure 2-3 Pedestrian/Cycling Network



Source: DSP

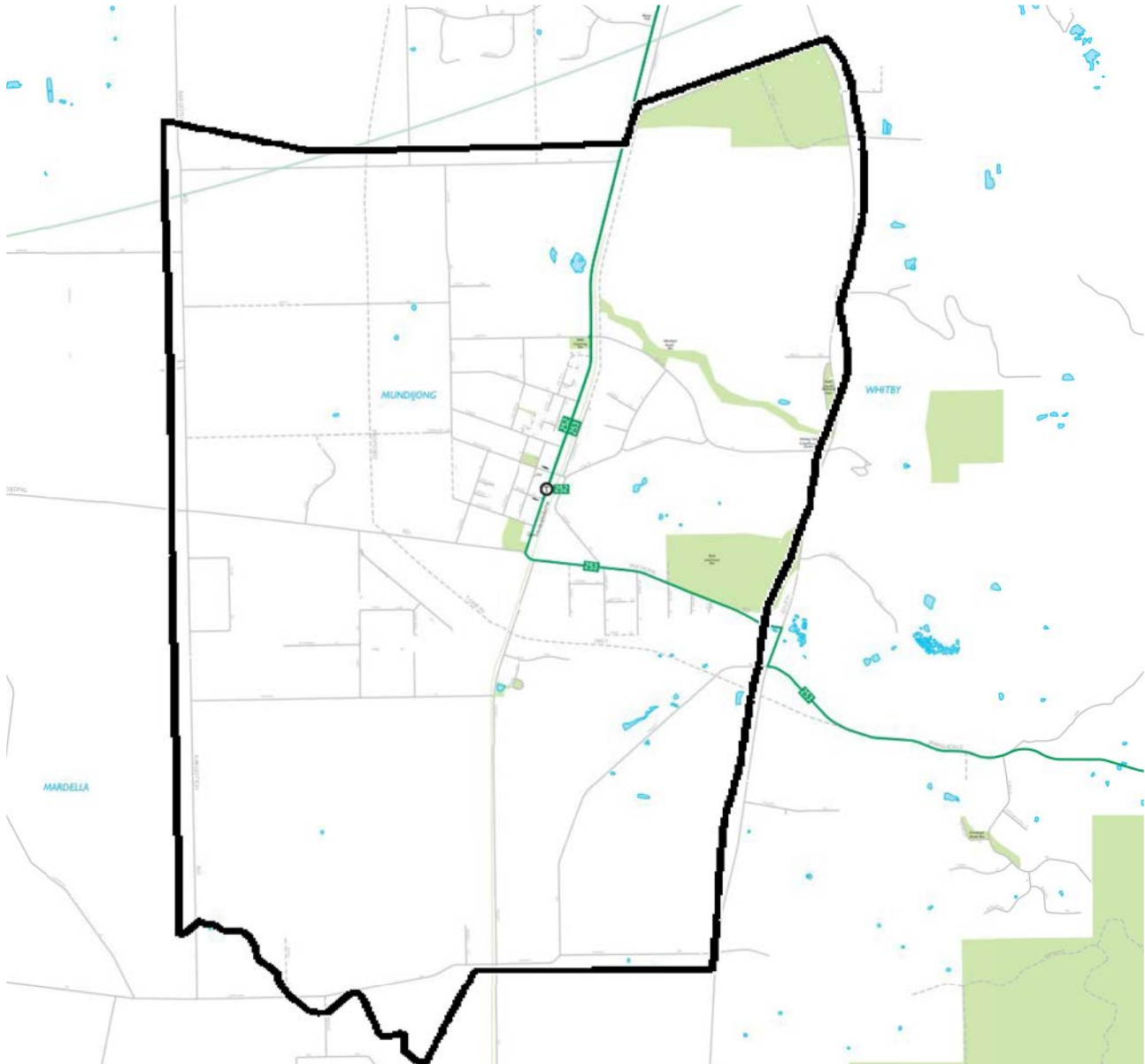
## 2.5 Existing Public Transport Services

The existing public transport services are shown below in **Figure 2-4**. A railway line runs alongside the Soldiers Road; however, standard commuter rail services currently terminate at Armadale.

The rail line south of Armadale is used primarily for freight, with a regional rail service provided by the Australind to Perth and Bunbury twice daily.

Through the shire runs the Perth to Bunbury railway line along the South Western Highway however, currently commuter rail services terminate at Armadale, with south of Armadale line used for freight only and the Australind for between Perth and Bunbury which runs twice daily. Current railway station for Mundijong Australind service is located at the intersection of Whitby Street and Paterson Street.

Figure 2-4 Existing Public Transport Routes



Source: Transperth

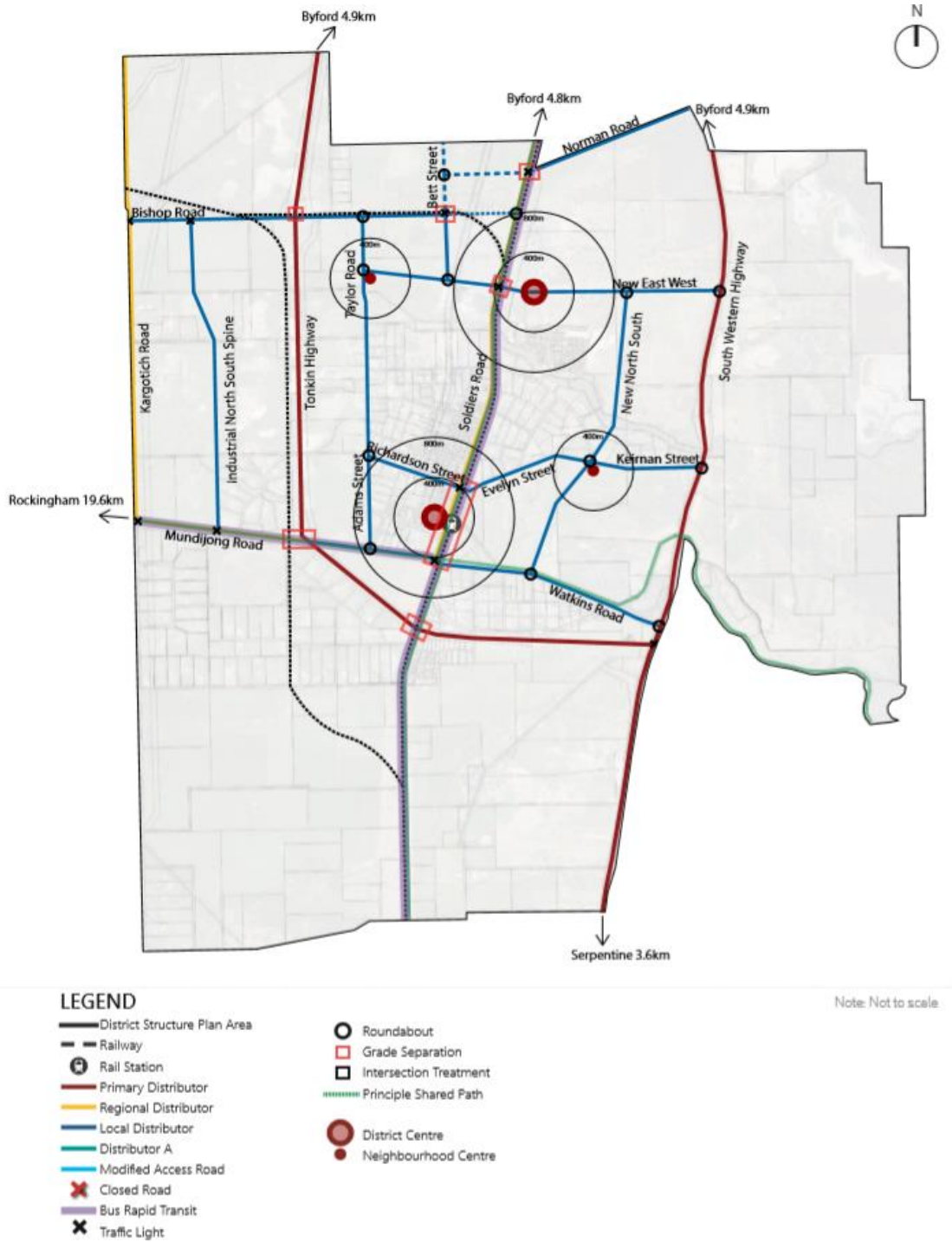
Transperth bus Routes 252 and 253 provide connections to Armadale Station,

### 3 Proposed Changes of Transport Networks

#### 3.1 Road Network Changes

The current structure plan provides a list of changes that are proposed for the existing roads as per **Figure 3-1**.

Figure 3-1 Road Network Changes



Source: DSP

The following changes are proposed to the existing road network along with the proposed new roads:

- > Extension of Tonkin Highway southward to connect through to Mundijong Road.
- > Intersection connection treatments onto Tonkin Highway at Bishop Road and Mundijong Road.
- > Upgrade of Mundijong Road
- > Extension of Norman Road to connect to Bishop Road.
- > Extension of Doley Road connecting through to Bishop Road.
- > Additional crossing south of Kiernan Street to relink Richardson Street and Evelyn Street.
- > Relocation of Kiernan Street and South Western Highway cross point

### **3.2 Pedestrian and Cycle Network Changes**

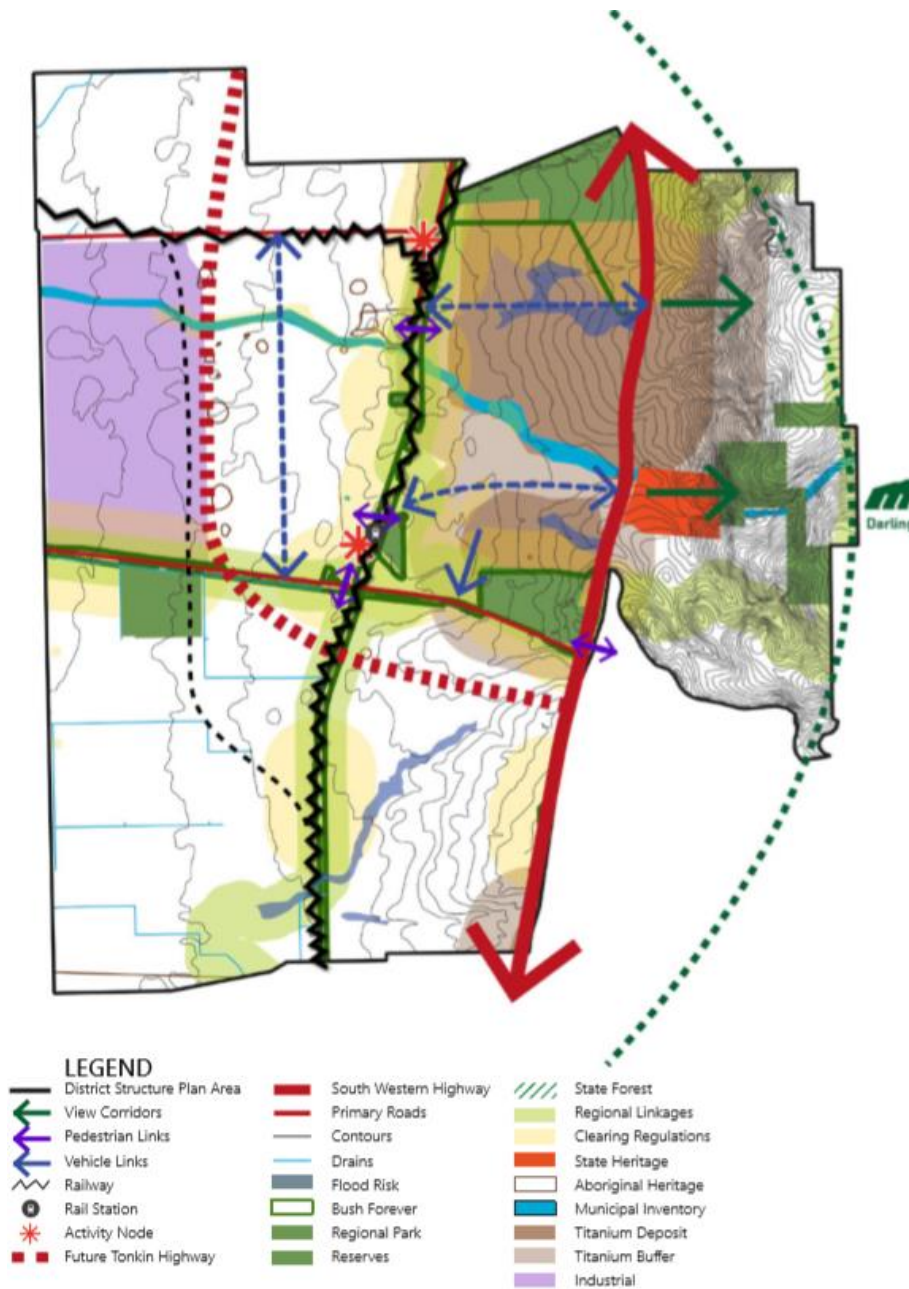
The strategies and opportunities to improve the pedestrian and cycle network include:

- > The extension of cycle/pedestrian shared path network.
- > Improvements of walking and cycling links to the town centre and railway station.

As such, the opportunities and constraints map is explained on **Figure 3-2**.



Figure 3-2 Opportunities and Constraints Map



Source: MDSP

### 3.3 Public Transport Network Changes

Within the Sub-regional Planning Framework, the proposed public transport includes a network of passenger rail lines and transit corridors. A proposal for the extension of the Armadale line to Byford exists within the BDSP area. This railway facility is also proposed to have a High Frequency Transit Corridor (HFTC) providing public transport connections between activity centres, population catchments, train stations and local bus services.

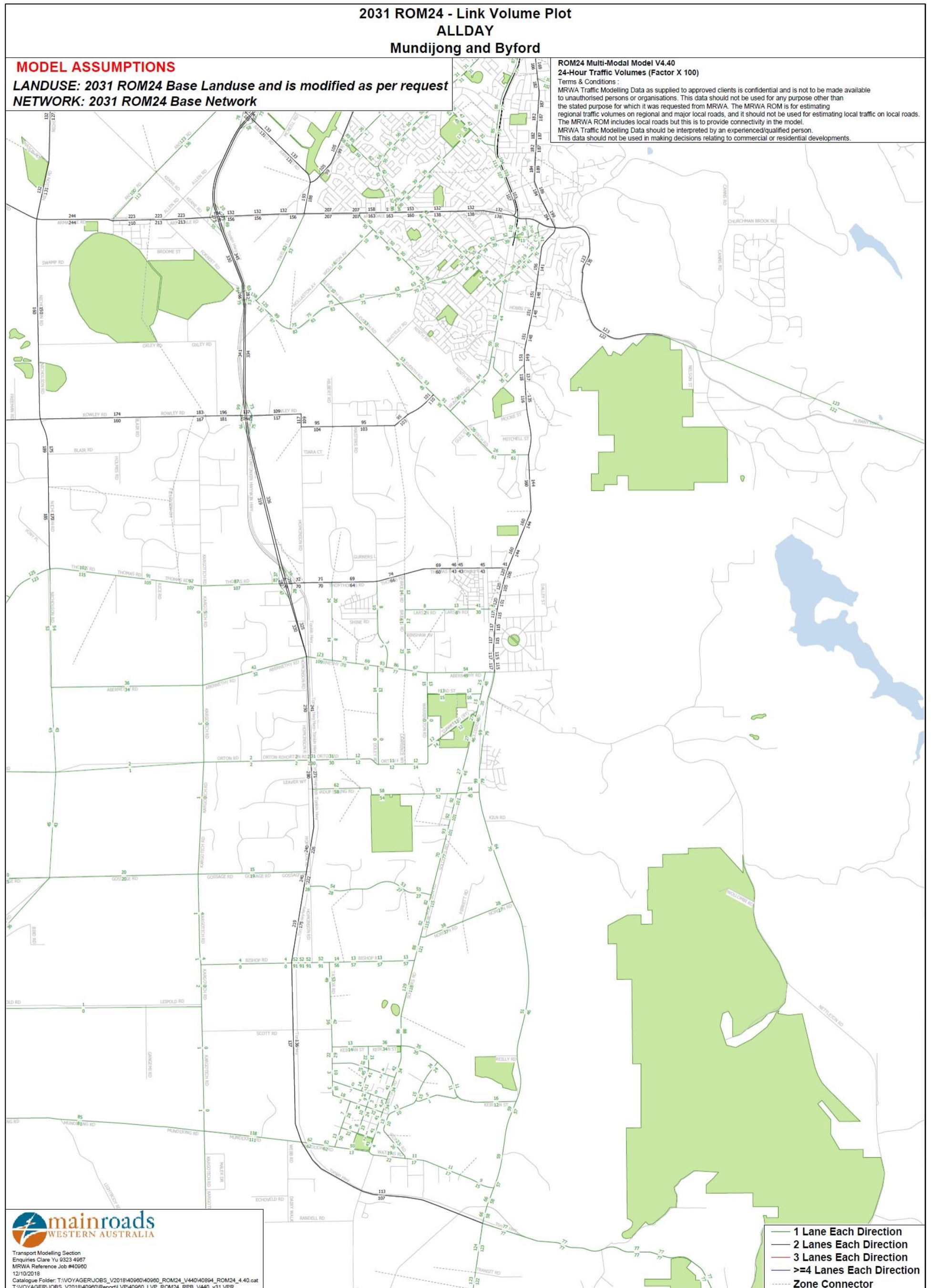
### 3.4 Projected Daily Traffic Volumes

Assessment of the impacts of development growth both within and beyond the Byford Structure Plan area has been facilitated through Main Roads' ROM24 strategic model. This model relies on land use projections provided by Local and State Government agencies to generate vehicle trips across the network. Cardno has endeavoured to ensure that the land uses defined in ROM24 within the Study Area are consistent with the Shire's anticipated development horizon.

It is acknowledged that full build-out of this land area may not be achieved within the 2031 horizon, which is the only ROM24 time scale currently supplied by Main Roads WA. As such, the ROM24 outputs used as the basis of this TIA have been used to establish an anticipated development and traffic scenario at the point when build-out of the Shire's development planning has been achieved.

**Figure 3-3** shows the 2031 daily vehicle volume output from 2031 ROM24 model as provided by Main Roads WA.

Figure 3-3 ROM24 Daily traffic Volumes (2031 horizon)



Source: Main Roads WA

## 4 Integration with Surrounding Area

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### 4.1 Surrounding Attractors/Generators

The major generators within the surrounding area include mostly rural residential dwellings and some industrial land uses.

### 4.2 Proposed Changes to Surrounding Land uses

The structure plan identifies the requirement for development of areas in close proximity of key public transport networks and new nodes of activities. This encourages the development of the Mundijong town centres as a 'Governance precinct'. The prediction for the area is that it would cater for increased agriculture-related industries comprising transport and logistics.

### 4.3 Level of Accessibility

The main access to the structure plan area from external attractors is through the connectivity of internal road networks to South Western Highway and Mundijong Road, which are classified as Primary Distributor and Regional Distributor. Access through internal road intersections include:

- > South Western Highway and Norman Road
- > South Western Highway and Kiernan Street
- > South Western Highway and Watkins Road
- > South Western Highway and Feast Road
- > Kargotich Road and Mundijong Road
- > Kargotich Road and Lawlands Road

When the access is through public transport, bus route 252 travels along South Western Highway and towards Armadale Station.

A Bridle trail runs from Soldiers Road and Mundijong Road and a shared path exists along South Western Highway.

The proposed Train Station in Mundijong Town Centre and the associated walking and cycling catchment will further improve accessibility and match the desire lines.

It is expected that the existing road network will be able to cater for the travel desire lines between the structure plan area and the surrounding land uses.

## 5 Analysis of Transport Network

### 5.1 Assessment Years and Time Periods

The assessment period is based on the future mesoscopic modelling results which was conducted for 2031.

### 5.2 Background and Future Traffic Generation Estimation

A mesoscopic traffic model was developed to model the current traffic situation and provide a base to determine the likely future traffic impacts.

A number of data sources were used in the formulation of the mesoscopic model which included traffic, surveys, census data and information provided by local authorities.

The future-year models are based on the traffic growth scenario derived from information provided by the Shire of Serpentine-Jarrahdale and Main Roads (ROM24 outputs) for the 2031 scenario years.

### 5.3 Intersection Assessment

Based on the results provided by the mesoscopic model, the network for the area of Mundijong is operating at an acceptable level of service with sufficient capacity to accommodate traffic for the 2018 scenario.

With respect to the 2031 scenario, which includes the proposed road network changes in **Figure 5-3**, the mesoscopic model identified no intersections which exhibited significantly capacity or delay issues.

All other intersections assessed through the mesoscopic model were considered to operate at an acceptable level of service for the 2031 scenario.

The following density maps identify locations where peak period demand may create localised capacity constraints, and where upgrades to the network may be required.

Figure 5-1 Simulated 2031 Density Map (AM Peak)

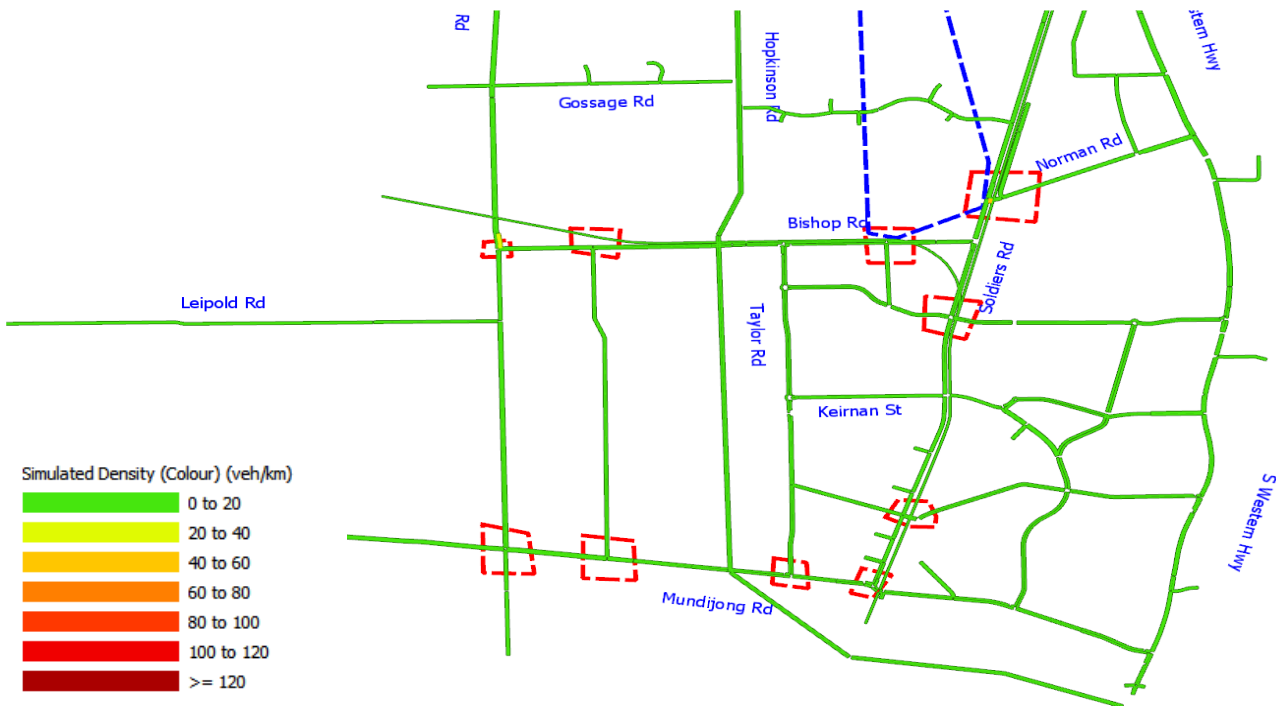


Figure 5-2 Simulated 2031 Density Map (PM Peak)

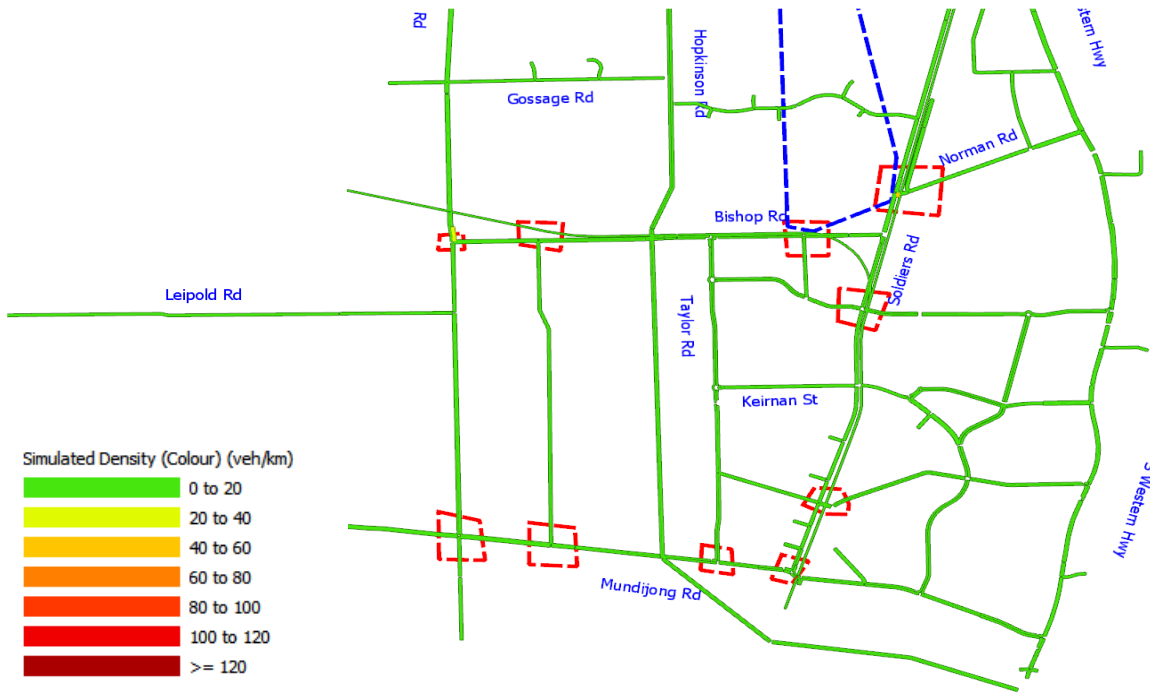
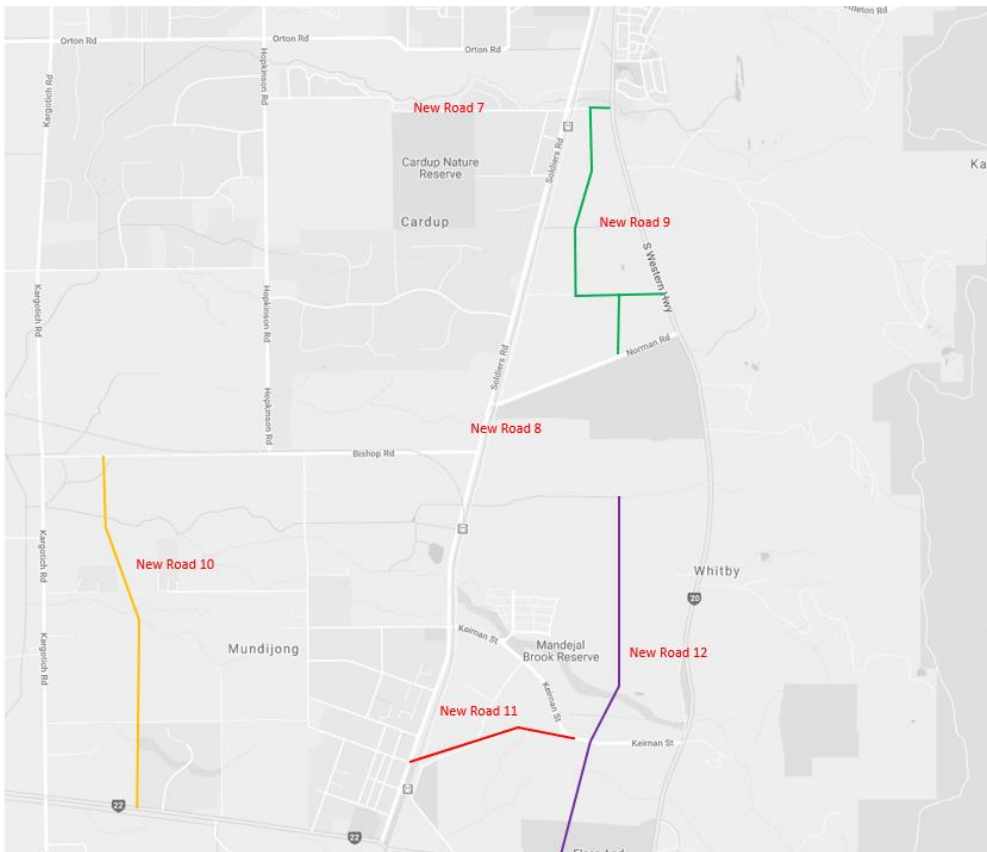


Figure 5-3 indicates the new road locations and the locations of the assessed intersections within the Mundijong Area.

Figure 5-3 Location of Assessed Intersections and New Links

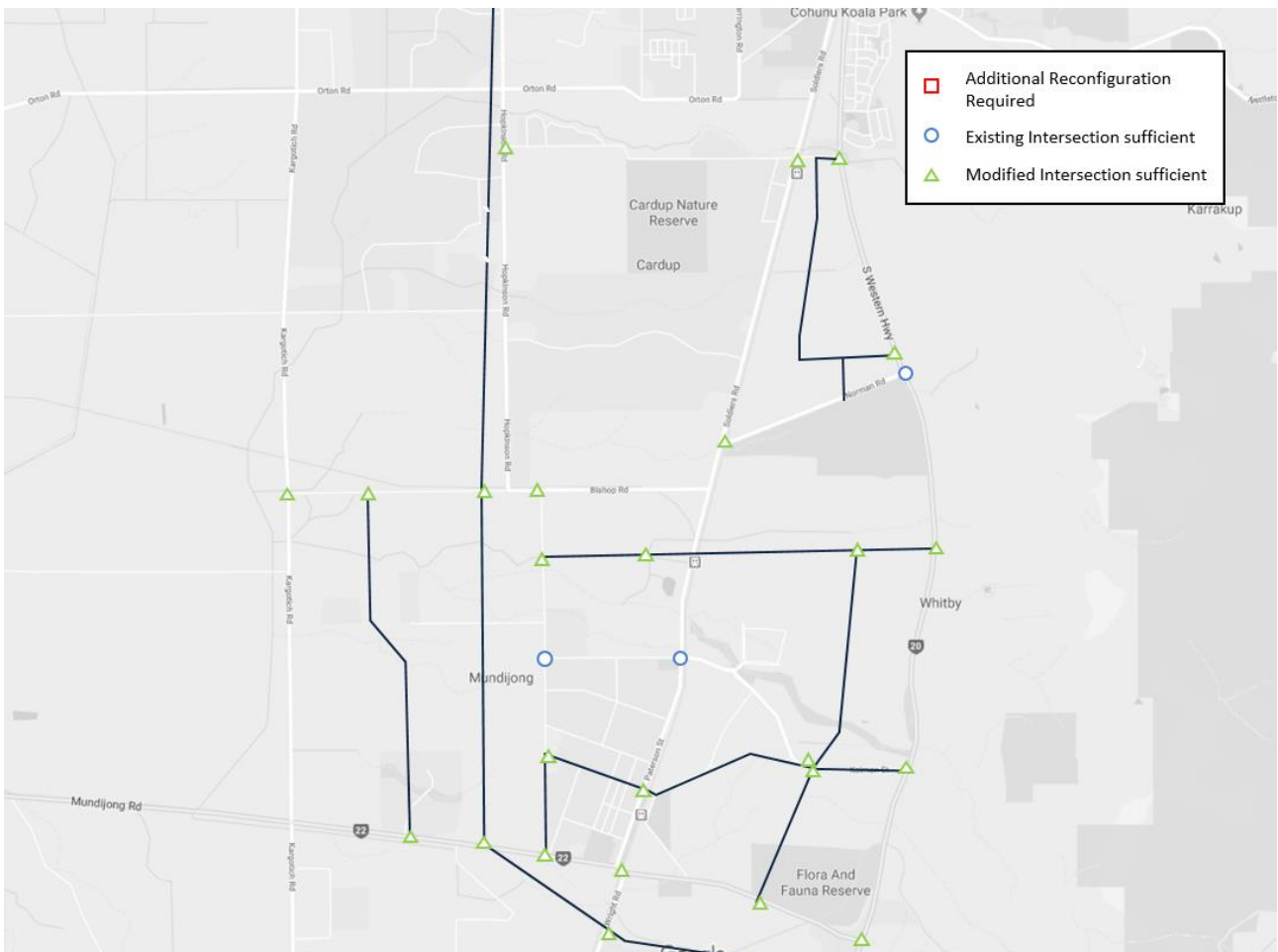


### 5.4 Summary of Results

The following map identifies the results of intersection evaluation across the Mundijong area. Intersections have been classified into 3 groups and shown in **Figure 5-4** below:

1. **Existing Intersection Sufficient:** the existing (2018) geometry has been evaluated through the Aimsun mesoscopic model and shown to be sufficient to accommodate future traffic growth.
2. **Modified Intersection Sufficient:** the Shire’s proposed modifications have been evaluated through the Aimsun mesoscopic model and shown to be sufficient to accommodate future traffic growth.
3. **Additional Reconfiguration Required:** The existing and/or proposed intersection form has been evaluated through the Aimsun mesoscopic model and no intersections were found to experience excessive congestion or delay.

Figure 5-4 Intersection Sufficiency Map



## 6 Conclusion

Cardno was commissioned by the Shire of Serpentine to prepare a Transport Impact Assessment for the proposed Mundijong Structure Plan ('the Site' or 'the Structure Plan').

The traffic impacts from this Structure Plan have been evaluated in a mesoscopic modelling framework, which classified the network into three categories based on operational performance:

1. The existing intersection forms are considered sufficient to accommodate future growth. These include:
  - South West Highway/Norman Road
  - Soldiers Road/Keirnan Street
  - Adams Street/Keirnan Street
  
2. The proposed intersection forms are considered sufficient to accommodate future growth. These include:
  - South Western Highway/Cardup Siding Road
  - Soldiers Road/Cardup Siding Road
  - Hopkinson Road/Cardup Siding Road
  - Doley Road/Cardup Siding Road
  - South Western Highway/New Road 9
  - Soldiers Road/Norman Road
  - Doley Road/Norman Road
  - Kargotich Road/Bishop Road
  - New Road 10/Bishop Road
  - Hopkinson Road/Bishop Road
  - Taylor Road/Bishop Road
  - Taylor Road/Leopold Road
  - Doley Road/Leopold Road
  - New Road 12/Leopold Road
  - South Western Highway/Leopold Road
  - South Western Highway/Keirnan Street
  - Galvin Road/Keirnan Street
  - New Road 12/Keirnan Street
  - Patterson Street/Richardson Street
  - Adams Street/Richardson Street
  - New Road 10/Mundijong Road
  - Hopkinson Road/Mundijong Road
  - Adams Street/Mundijong Road
  - Patterson Street/Mundijong Road
  - New Road 12/Mundijong Road
  - South Western Highway/Mundijong Road
  - Wright Road/Lampiter Drive



- Doley Road/Bishop Road
- Kargotich Road/Mundijong Road

Overall, with the reconfigured intersection forms the SP network is considered to operate satisfactorily in the 2031/future scenario.

Mundijong Structure Plan

APPENDIX

A

WAPC CHECKLIST

Item	Provided	Comments/Proposals
<b>Summary</b>		
<b>Introduction/Background</b>	Included in Section 1	
<b>Structure plan proposal</b>	Included in Section 1	
▪ regional context	Included in Section 1	
▪ proposed land uses	Included in Section 1	
▪ table of land uses and quantities	Included in Section 1	
▪ major attractors/generators	Included in Section 4	
▪ specific issues	N/A	
<b>Existing situation</b>		
▪ existing land uses within structure plan	Included in Section 2	
▪ existing land uses within 800 metres of structure plan area	Included in Section 2	
▪ existing road network within structure plan area	Included in Section 2	
▪ existing pedestrian/cycle networks within structure plan area	Included in Section 2	
▪ existing public transport services within structure plan area	Included in Section 2	
▪ existing road network within 2 (or 5) km of structure plan area	Included in Section 2	
▪ traffic flows on roads within structure plan area (PM and/or AM peak hours)	N/A	
▪ traffic flows on roads within 2 (or 5) km of structure plan area (AM and/or PM peak hours)	Included in Section 2	
▪ existing pedestrian/cycle networks within 800m of structure plan area	Included in Section 2	
▪ existing public transport services within 800m of structure plan area	Included in Section 2	
<b>Proposed internal transport networks</b>		
▪ changes/additions to existing road network or proposed new road network	Included in Section 3	
▪ road reservation widths	N/A	
▪ road cross-sections & speed limits	N/A	
▪ intersection controls	Included in Section 3	
▪ pedestrian/cycle networks and crossing facilities	Included in Section 3	
▪ public transport routes	Included in Section 3	
<b>Changes to external transport networks</b>		
▪ road network	Included in Section 3	
▪ intersection controls	Included in Section 3	
▪ pedestrian/cycle networks and crossing facilities	Included in Section 3	
▪ public transport services	Included in Section 3	
<b>Integration with surrounding area</b>		
▪ trip attractors/generators within 800 metres	Included in Section 4	
▪ proposed changes to land uses within 800 metres	Included in Section 4	
▪ travel desire lines from structure plan to these attractors/generators	N/A	
▪ adequacy of external transport networks	N/A	
▪ deficiencies in external transport networks	N/A	

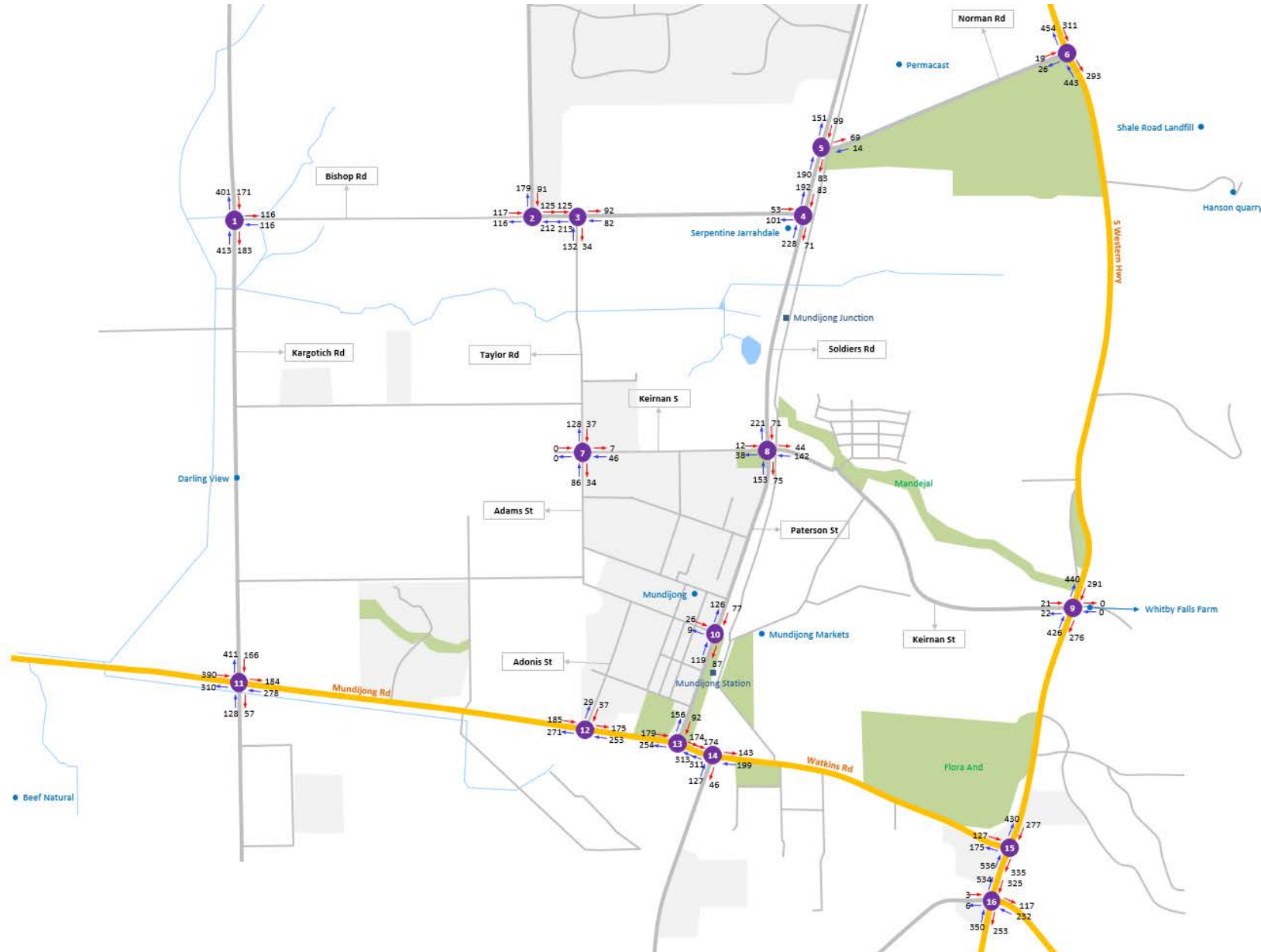
▪ remedial measures to address deficiencies	N/A	
<b>Analysis of internal transport networks</b>		
▪ assessment year(s) and time period(s)	Included in Section 5	
▪ structure plan generated traffic	Included in Section 5	
▪ extraneous (through) traffic	Included in Section 5	
▪ design traffic flows (ie. total traffic)	Included in Section 5	
▪ road cross-sections	N/A	
▪ intersection controls	Included in Section 5	
▪ access strategy	N/A	
▪ pedestrian / cycle networks	Included in Section 3	
▪ safe routes to schools	N/A	
▪ pedestrian permeability & efficiency	Included in Section 3	
▪ access to public transport	Included in Section 3	
<b>Analysis of external transport networks</b>		
▪ extent of analysis	Included in Section 5	
▪ base flows for assessment year(s)	Included in Section 5	
▪ total traffic flows	Included in Section 5	
▪ road cross-sections	N/A	
▪ intersection layouts & controls	Included in Section 5	
▪ pedestrian/cycle networks	Included in Section 3	
<b>Conclusions</b>	Included in Section 6	

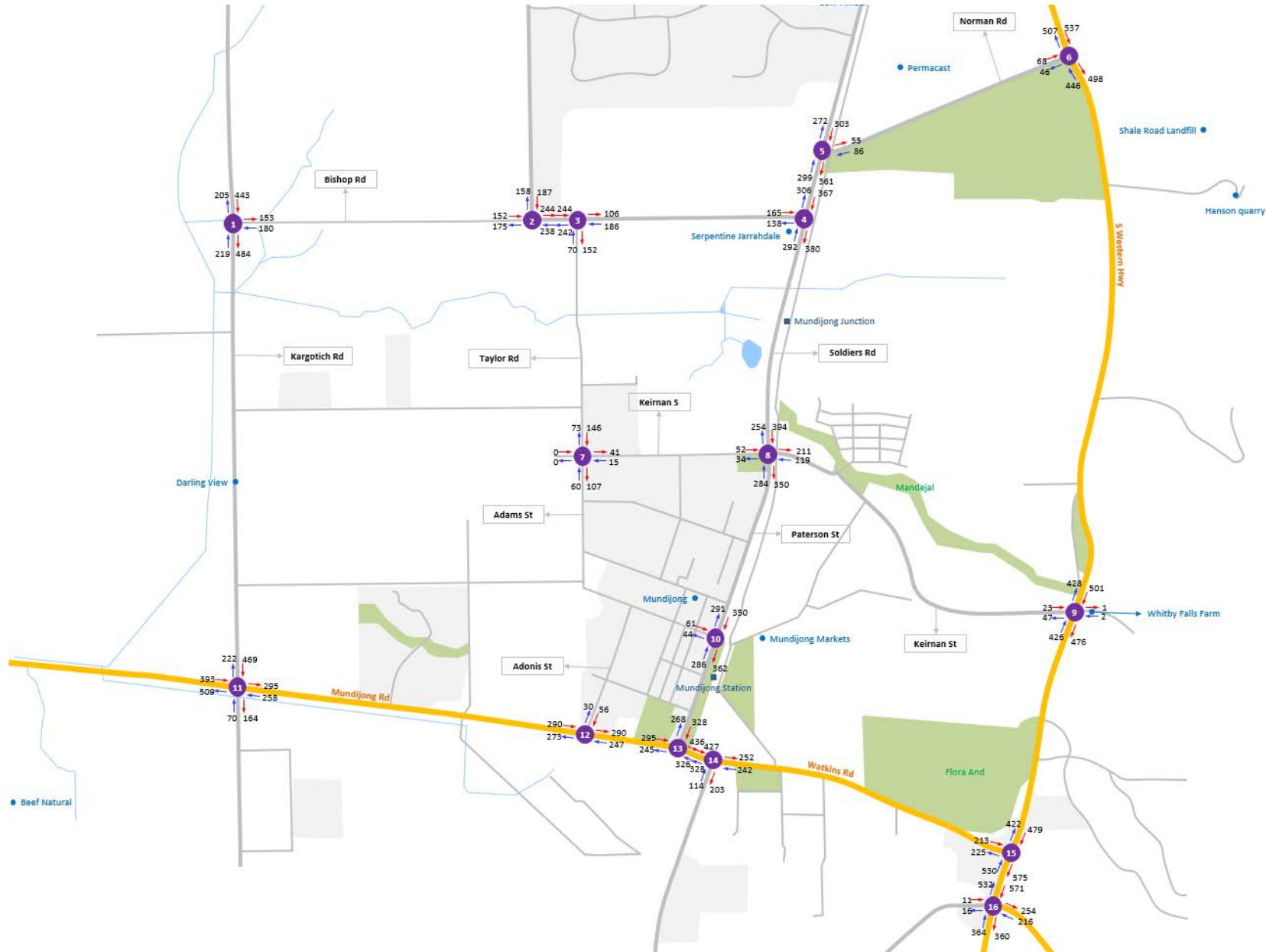
Mundijong Structure Plan

APPENDIX

B

EXISTING TRAFFIC VOLUMES





APPENDIX

C

FUTURE MODELLED TRAFFIC





2031 PM Peak

