PERRON GROUP

LOCAL STRUCTURE PLAN

LOTS 921 & 922 BALDIVIS ROAD and LOT 3 KEY CLOSE, BALDIVIS

AS ENDORSED BY WAPC (SEPTEMBER 2015)

PART TWO - EXPLANATORY REPORT

CLE TOWN PLANNING + DESIGN

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LOCAL STRUCTURE PLAN

LOTS 921, 922 BALDIVIS ROAD AND LOT 3 KEY CLOSE

PART TWO - EXPLANATORY REPORT

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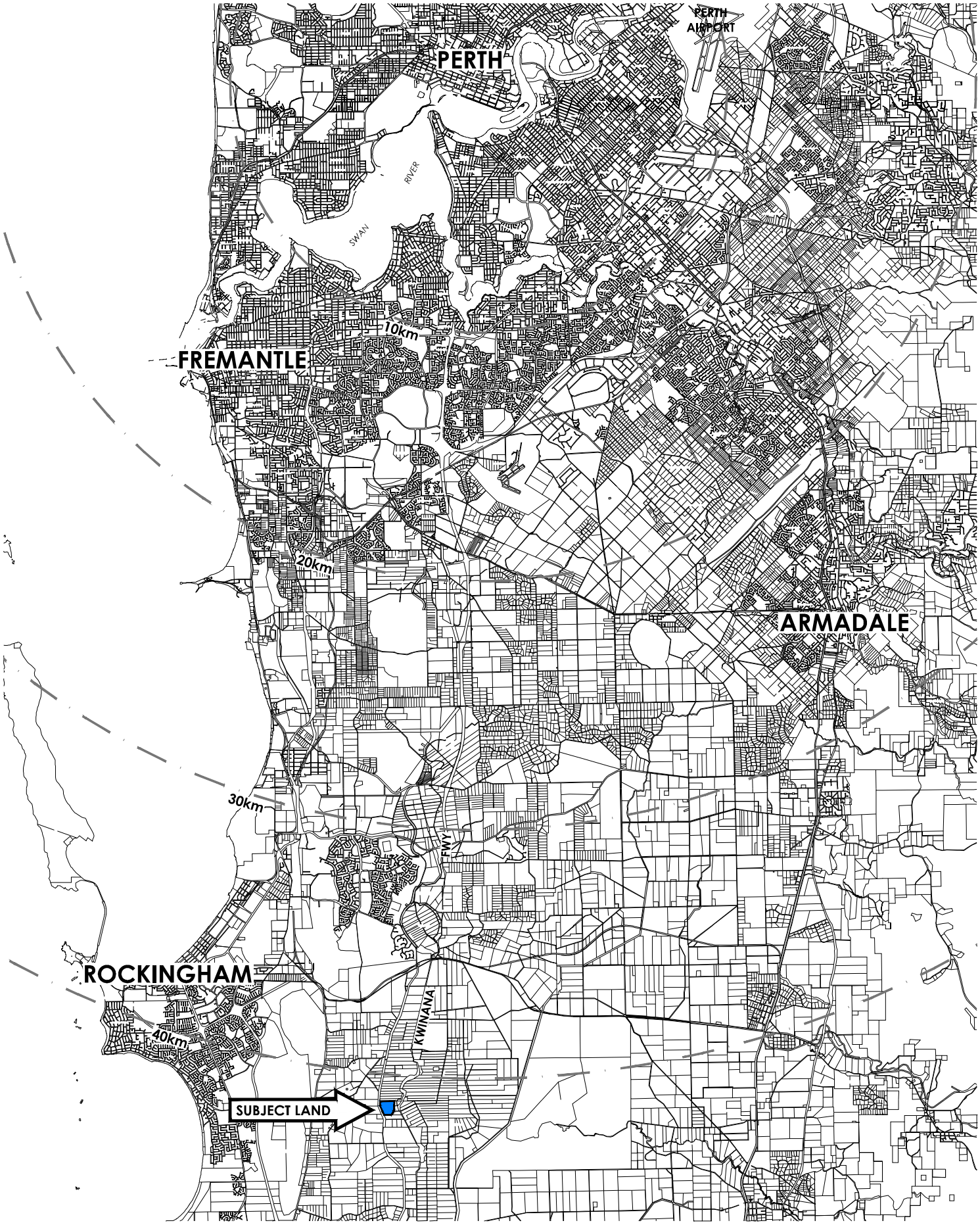


LOCATION PLAN

2304-100A-01 (23.10.2014), Not to scale

Figure 1

1.0 PLANNING BACKGROUND

1.1 Introduction and Purpose

The "Lots 921 and 922 Baldivis Road and Lot 3 Key Close, Baldivis Local Structure Plan" (from here on in referred to as the 'LSP') has been prepared by CLE Town Planning + Design, on behalf of Perron Developments Pty Ltd. The LSP is lodged in accordance with Clause 4.2 of the City of Rockingham Town Planning Scheme No.2 which requires a structure plan for 'Development' zoned land.

The LSP provides a statutory planning framework to guide future subdivision and development of the subject site and refines the level of planning detail provided in the East Baldivis District Structure Plan (DSP). The LSP draws on the key elements of the DSP whilst ensuring that all environmental, social, economic and infrastructure issues are comprehensively addressed.

The format of the LSP accords with the WAPC Structure Plan Preparation Guidelines (August 2012) and provides a framework for future subdivision and development for the site.

The Structure Plan consists of three parts:

Part 1: Statutory Section - contains the Structure Plan Map and the statutory planning provisions and requirements that will facilitate the various initiatives described in the Explanatory Section. These provisions are given the force and effect of the Scheme, pursuant to Clause 4.2.9 of the City of Rockingham Town Planning Scheme No.2.

Part 2: Explanatory Section - discusses the key outcomes and planning implications of the background and technical reports and describes the broad vision and more detailed planning framework which will be developed. Part 2 is based on a detailed site specific analysis of opportunities and constraints and the following technical reports and strategies:

- Environmental Assessment Report, including Vegetation Management Strategy and Fauna Management Strategy
- Bush Fire Management Plan
- Transport & Access Strategy
- Landscape Concept Plan and Descriptions
- Open Space Strategy
- Local Water Management Strategy
- Servicing and Infrastructure Strategy
- Transportation Noise Assessment

Part 3: Technical Appendices – includes the technical reports and supporting plans and maps outlined above.

The LSP will facilitate growth of the emerging Baldivis community through the creation of approximately 420 - 460 dwellings. The LSP will also contribute to the extensive public open space network and expand and connect into the existing local and district road network.

SITE PLAN AND ORTHOPHOTO

2304-101A-01 (23.10.2014), Not to scale

Figure 2

1.2 Land Description

1.2.1 Location and Land Area

The LSP area is located within the City of Rockingham approximately 40km south of the Perth CBD and approximately 1 km north-west of the Baldivis District Centre, as identified in State Planning Policy 4.2 – Activity Centres for Perth and Peel. A location plan is included as Figure 1.

The LSP area is ideally located to provide a retail and employment catchment for the Baldivis District Centre that will contribute to its commercial success.

The LSP is broadly bounded by lot 750 Baldivis Road to the north, the Kwinana Freeway to the east, Baldivis Road to the west and Safety Bay Road to the south. The existing Parks and Recreation (Tramway) reserve is located within the Baldivis Road reserve and abuts the western boundary of the subject site.

The Kwinana Freeway is located to the east of the subject land. The subject land can be readily accessed from the Freeway via the Safety Bay Road interchange to the south or Mundijong Road interchange to the north.

1.2.2 Area and Land Use

The site has an area of approximately 27ha, of which 27.1 ha (90%) is owned by Perron Developments Pty Ltd. The balance of the land is comprised of the Key Close reserve (0.45ha). Historically the land has been used for agricultural / grazing purposes and as a result, is predominantly clear of vegetation.

Lots 921, 922 and 3 are currently vacant.

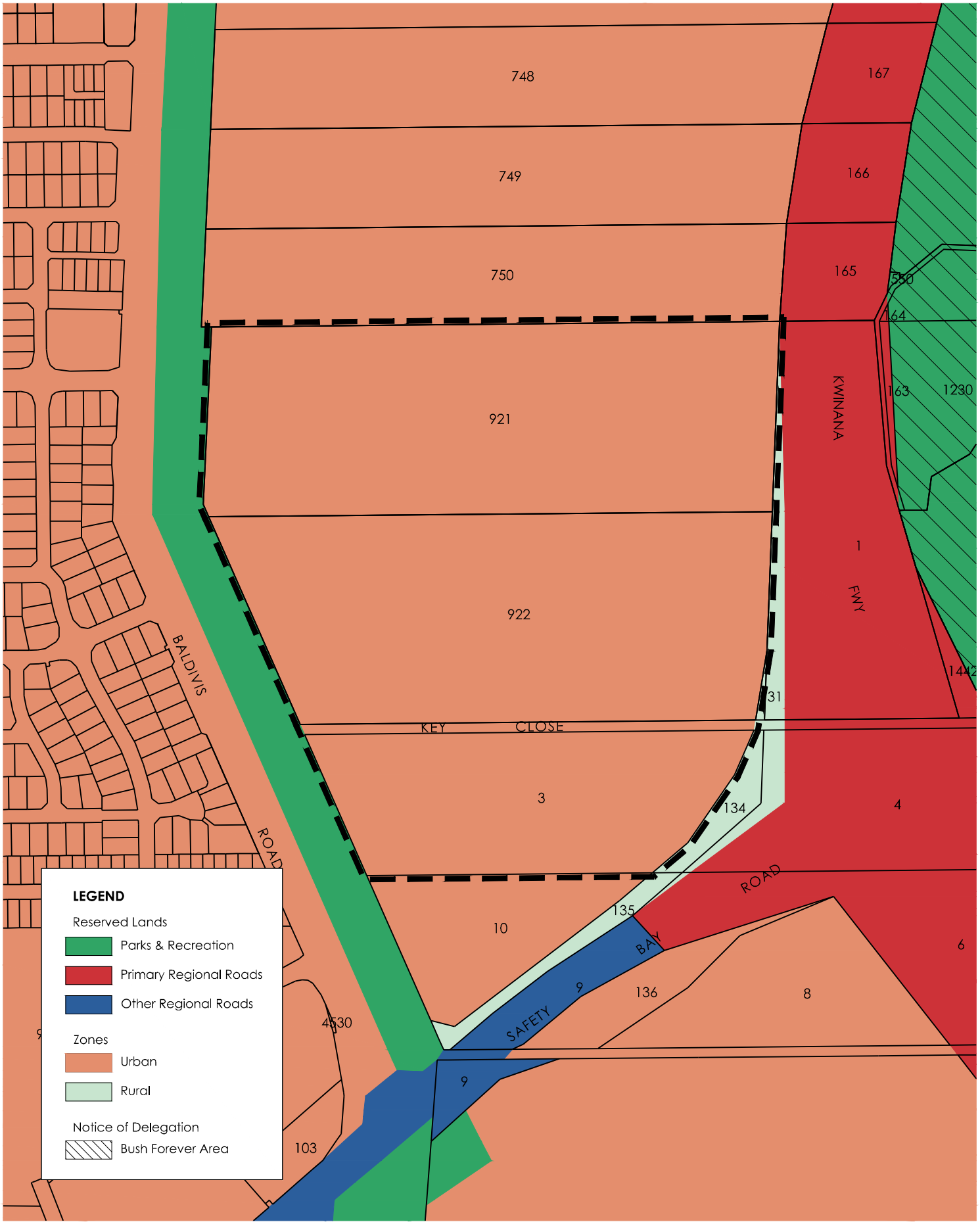
A site plan and orthophoto is included as Figure 2.

1.2.3 Legal Description and Ownership

The LSP comprises of 3 separate titles as described in Table 1 below.

Table 1: Legal Description

Lot No.	Street	Plan/ Diagram	Volume	Folio	Owner
921	Baldivis Road	202758	1977	612	Perron Developments Pty Ltd
922	Baldivis Road	202758	1977	613	Perron Developments Pty Ltd
3	Key Close	87411	2033	546	Perron Developments Pty Ltd



METROPOLITAN REGION SCHEME ZONING

2304-102A-01 (23.10.2014), Not to scale

Figure 3

1.3 Planning Framework

1.3.1 Zoning and Reservations

Metropolitan Region Scheme Zoning

The LSP area forms part of a broader precinct that was recently transferred from the 'Urban Deferred' zone to 'Urban' under the Metropolitan Region Scheme (MRS), with a publication in the Government Gazette notifying of the lifting of the urban deferment from the land on 18 March 2014. A plan depicting the current MRS zoning of the LSP area and surrounds is Figure 3.

The land immediately to the north of the LSP area is zoned 'Urban'. It is understood that a separate structure plan is currently being prepared over this land, and will be lodged in mid 2014. The land immediately abutting to the east and south is reserved as Primary Regional Road, while the land immediately to the west of the LSP area - known as the 'Tramway Reserve' - is reserved under the MRS for the purpose of Parks and Recreation.

City of Rockingham Town Planning Scheme No. 2

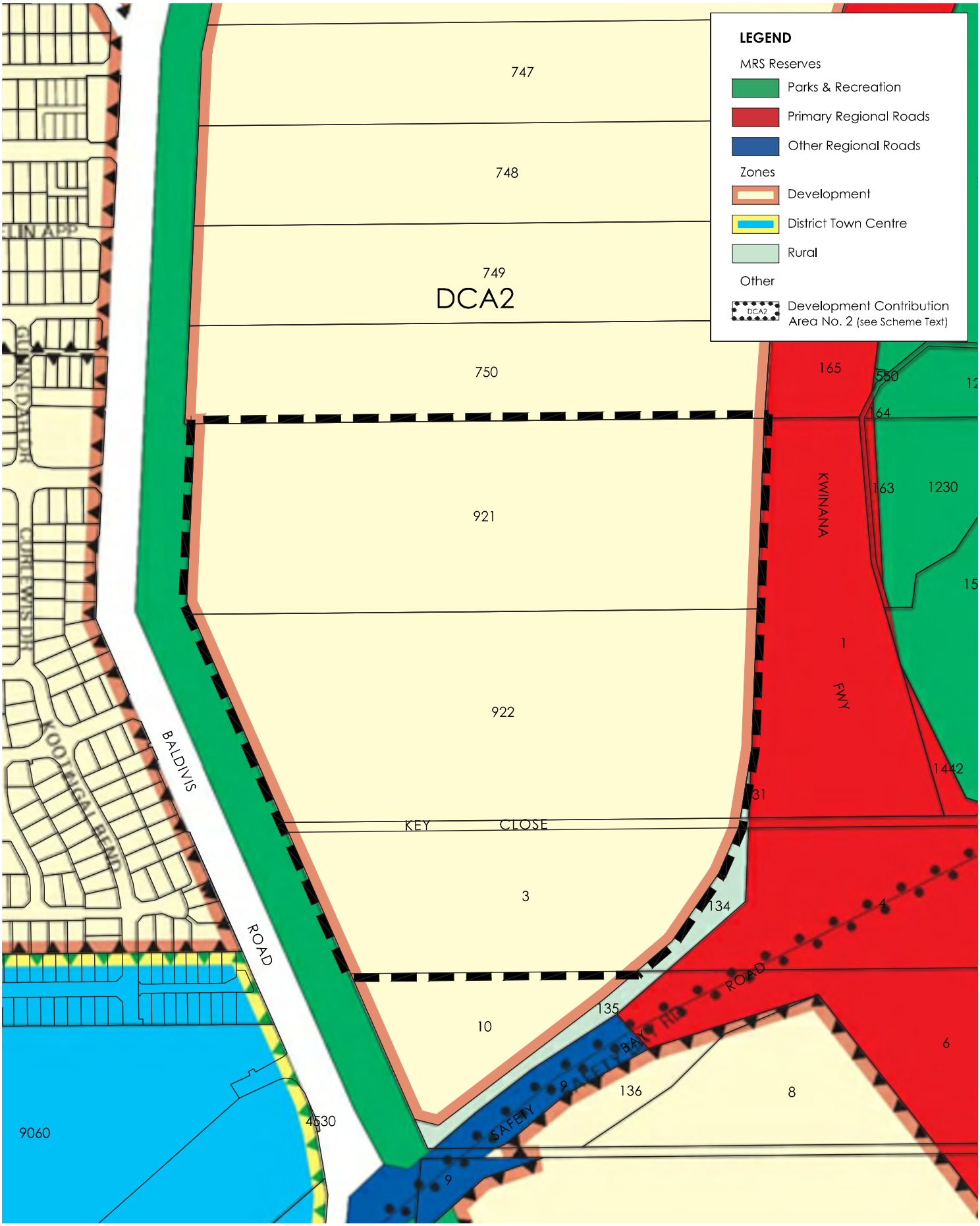
The LSP area is currently zoned 'Development' under Town Planning Scheme No.2 (TPS2), and is located within Development Area "DA40" that is identified in Schedule 9 of the Scheme. The current TPS2 zoning for the area is .

Schedule 9 sets out the requirements / special conditions for each Development Area. The provisions for DA40 include requirements to address / include the following matters as a detail of a Local Structure Plan:

- A Bush Fire Hazard Assessment; and
- An Acoustic Consultant Report prepared by a suitably qualified acoustic consultant to demonstrate how sensitive land uses will not be adversely impacted by noise generated by the Kwinana Freeway.

The Bush Fire Hazard Assessment and the LSP response is discussed further in section 3.3, while the hazard assessment, prepared by Bushfire Safety Consulting, is included in full as Appendix 1.

Acoustic impacts and LSP response is discussed further in section 3.6, while the Transportation Noise Assessment, prepared by Lloyd George and Associates, is Appendix 2.



CITY OF ROCKINGHAM TOWN PLANNING SCHEME 2

2304-103A-01 (23.10.2014), Not to scale

Figure 4

1.3.2 Higher Order Structure Plans

Draft Southern Metropolitan Sub-Regional Structure Plan (2009)

The draft Southern Metropolitan Sub-Regional Structure Plan (the Sub-Regional Structure Plan) was prepared by the WAPC and released for public comment in June 2009. The Sub-Regional Structure Plan is a strategic document that will guide the planning and growth of land within the southern metropolitan and Peel regions.

The LSP area has been identified as being suitable for urban development, being shown as 'Future Urban' under the Sub-Regional Structure Plan.

It is understood that the WAPC is currently reviewing the Sub-Regional Structure Plan in light of the recommendations of Directions 2031 and Beyond and will be re-released as a draft in mid 2014. It is expected that the Sub-Regional Structure Plan will reflect the statutory zoning of the LSP area and surrounding land.

East Baldivis District Structure Plan

The subject land is included within the area covered by the East Baldivis District Structure Plan (EBDSP), a strategic district structure plan prepared by the respective landowners within the East Baldivis corridor. The EBDSP was advertised for public comment by the City of Rockingham in late 2013 and was adopted by the City as a strategic structure plan in February 2014.

The EBDSP broadly identifies the subject land and surrounds as predominantly residential, with a portion of a primary school located on lot 921 at the northern extent of the subject area. The EBDSP is Figure 5.

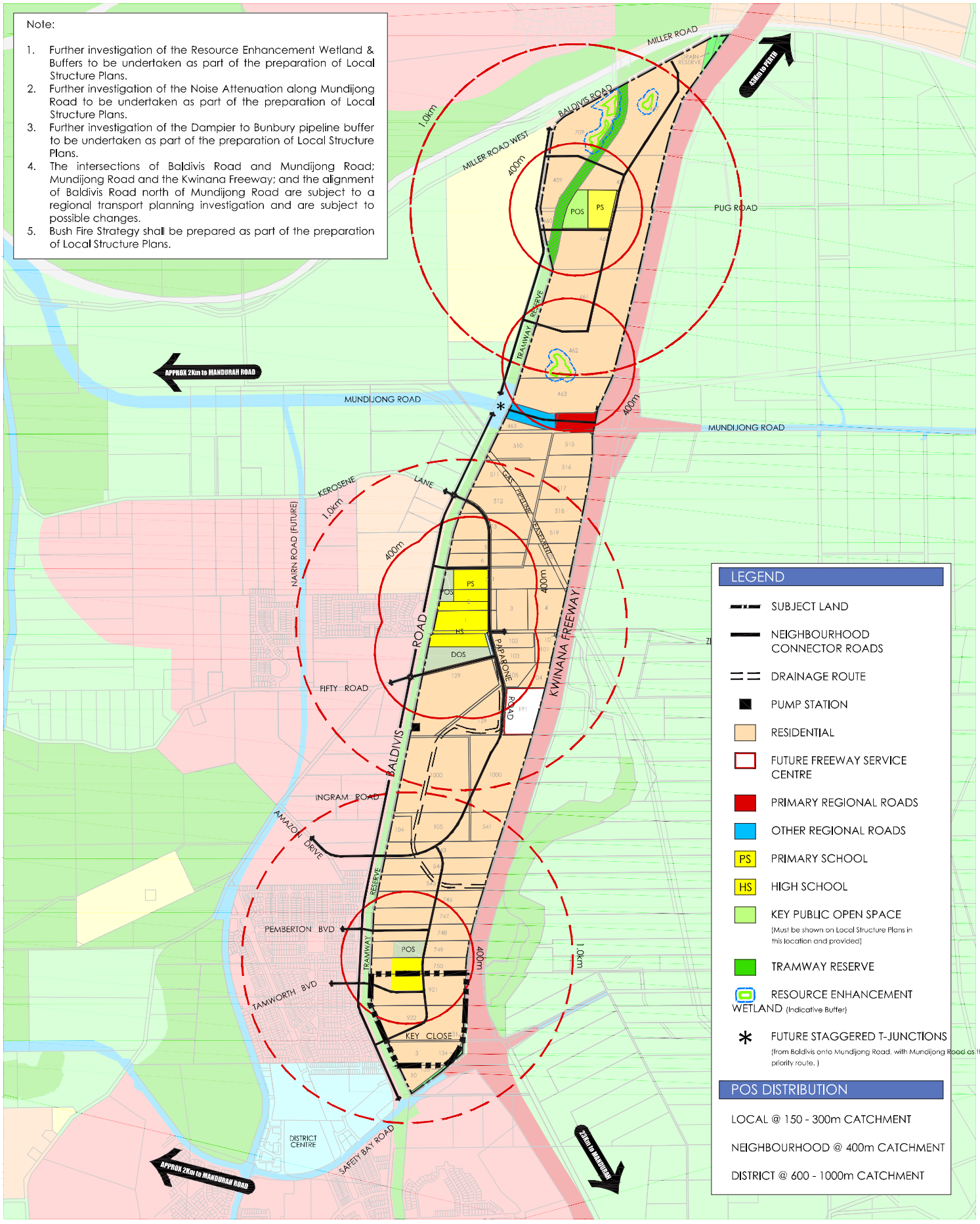
The EBDSP is supported by the following technical reports, which assist to define the key land use principles and inform subsequent stages of planning:

- Environmental Assessment Report
- Servicing Report
- Traffic and Transport Report
- Hydrological Report
- Acoustic Report
- Commercial and Community Facilities Report
- Bush Fire Hazard Assessment Report

The LSP is entirely consistent with the key land use principles of the EBDSP, and refines and expands upon these principles to create a more specific plan for this area.

Baldivis Activity Centre Structure Plan (2012)

The LSP area is immediately north-east of the land covered by the Baldivis Activity Centre Structure Plan (BACSP) which outlines the high-level objectives and intended growth of the centre. The LSP area is in close proximity to the 'Northern' precinct as identified by the BACSP.



EAST BALDIVIS DISTRICT STRUCTURE PLAN

2304-104A-01 (11.11.2014), Not to scale

Figure 5

The 'Northern' precinct is intended to be primarily residential in character and will serve as a transitional area between the retail / commercial core of the activity centre and the more traditional suburban housing product in the adjacent residential developments to the north. The LSP recognises these key principles and provides an appropriate traffic and density response.

1.3.3 Planning Strategies

Directions 2013 and Beyond (August 2010)

Directions 2031 and Beyond is the regional spatial framework and strategic plan that establishes a vision for the future growth of the Perth Metropolitan Region for the delivery of housing, infrastructure and essential services.

Directions 2031 includes the structure plan area within the South-West Sub Region. This region is identified as experiencing considerable economic and population growth, with population expected to grow by 34% (278,000 people) by the year 2031. Directions 2031 also recommends a housing density target of 15 dwellings per gross urban zoned hectare. The need for density targets to encourage more efficient and effective housing is acknowledged however, it is important that the application of these targets recognises the impact of site specific constraints and market conditions on the ability to deliver density.

Directions 2031 is supported at a sub-regional level by the draft Outer Metropolitan Perth and Peel Sub-Regional Strategy.

Draft Outer Metropolitan Perth and Peel Sub-Regional Strategy (2010)

The draft Outer Metropolitan Perth and Peel Sub-Regional Strategy (the Sub-Regional Strategy) provides additional information about the level of expected population growth and highlights development opportunities throughout the metropolitan area and Peel region.

The LSP area is located in the south-west sub-region where with the Sub-Regional Strategy identifies 99,260 dwellings being provided through greenfield development. Consistent with the statutory zoning at the time, the Sub-Regional Strategy identifies the East Baldivis cell, including the LSP area as 'urban deferred zone undeveloped'.

A copy of the Sub-Regional Strategy (South-West Region) is Figure 6.

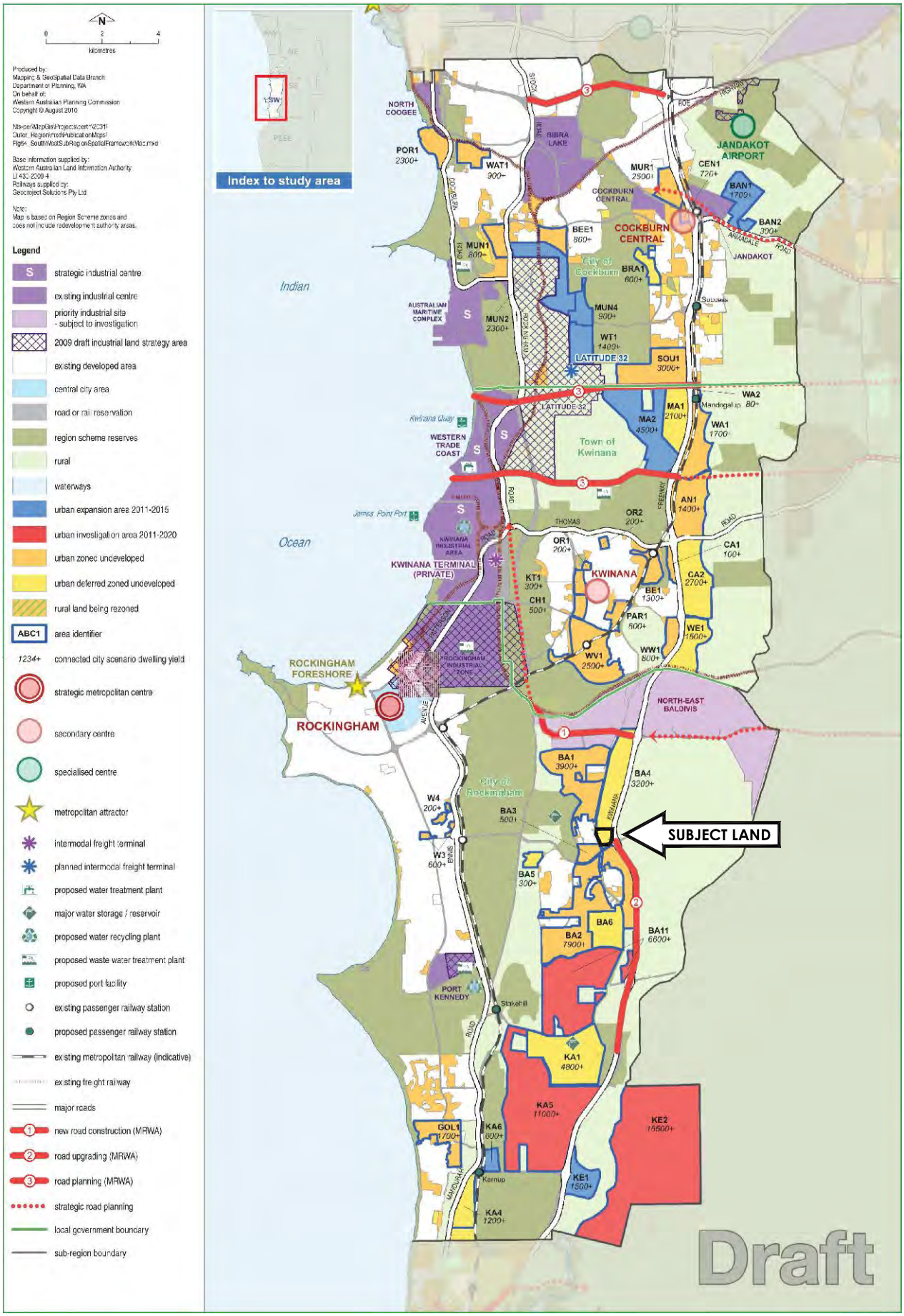
City of Rockingham Urban Growth Programme (2009)

The City of Rockingham Urban Growth Programme was prepared to assist Council in understanding the likely patterns of urban growth within the City of Rockingham and considered existing population and dwelling statistics, existing structure plans and forecast future urban growth patterns. The Programme provides the City with a summary of expected urban development areas to help guide Council in its decision making processes.

The LSP area falls within Precinct 3 of Baldivis North which is identified as being 'Future Development' but with no structure plan in place. The Programme suggests that development of the entire Precinct 3 area is expected to accommodate approximately 5,000 dwellings over the next fifteen years.

The EBDSP and LSP represent the fulfilment of the expected urban growth within Baldivis North, as projected by the Programme.

Source: Outer Metropolitan Perth & Peel Sub Regional Strategy



1.3.4 Policies

The following sections summarise those government policies and strategies that are relevant to the urbanisation and development of the LSP area.

SPP 2.1 – Peel Harvey Coastal Plain Catchment

The structure plan area falls within the Peel Harvey Coastal Plain, and as such, the provisions of SPP 2.1 apply.

The purpose of SPP 2.1 is to ensure that land use changes within the Peel-Harvey estuarine system likely to cause environmental damage to the estuary are brought under planning control and prevented.

The objectives of this policy are to:

- Improve the social, economic, ecological, aesthetic, and recreational potential of the Peel-Harvey coastal plain catchment.
- Ensure that changes to land use within the catchment to the Peel-Harvey estuarine system are controlled so as to avoid and minimise environmental damage.
- Balance environmental protection with the economic viability of the primary sector.
- Increase high water-using vegetation cover within the Peel-Harvey coastal plain catchment.
- Reflect the environmental objectives in the draft Environmental Protection Policy (Peel-Harvey Estuarine System) 1992.
- Prevent land uses likely to result in excessive nutrient export into the drainage system.

These objectives have all been addressed previously as part of the rezoning of the East Baldivis cell and the subsequent District Structure Planning process. This structure plan is in accordance with SPP 2.1, and the previously endorsed higher order planning framework. There are no direct development implications for the site as a result of this policy. The structure plan incorporates Water Sensitive Urban Design principles and Best Management Practice to prevent excessive nutrient export into the drainage system, will improve social, aesthetic, environmental and recreational potential within the catchment and aims to balance environmental protection with economic viability within the region.

City of Rockingham Local Planning Policy 3.4.1 – Public Open Space

The purpose of LPP 3.4.1 is to set out the objectives and policy provisions which the City shall have due regard to in assessing the provision, location, design and development of public open space in the City of Rockingham, including new structure plan areas. LPP 3.4.1 elaborates upon the key principles of Liveable Neighbourhoods Design Element 4 – Public Open Space, and provides specific requirements with respect to location, layout and function of areas of open space.

The structure plan recognises and is consistent with the key elements of LPP 3.4.1, and this is reflected in section 3.2 of the structure plan, as well as Appendix 6 – Landscape Strategy.

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City of Rockingham Baldivis Tramway Management Plan

The City has recently prepared a management plan that encompasses the full extent of the Baldivis Tramway, including the portion adjacent to the structure plan area (precinct 2). The Management Plan puts in place a coordinated framework for the management and enhancement of the Baldivis Tramway, as well as addressing interface and bushfire considerations.

Of particular relevance to the structure plan are the provisions pertaining to the interface between the development site and the Tramway Reserve, where design levels are an important consideration. This is discussed further in section 3.10 and Appendix 6.

SPP 5.4 – Road and Rail Transport Noise and Freight Considerations in Land Use Planning

The eastern boundary of the LSP area abuts the Kwinana Freeway – an existing primary regional road and major transport corridor. As such, the proposal must be considered in the context of SPP 5.4, which guides noise sensitive development in proximity to major transport routes. A Transportation Noise Assessment has been prepared by Lloyd George Acoustics in accordance with SPP 5.4 and the requirements of Schedule 9 of TPS 2 and is included as Appendix 2 to the LSP.

Liveable Neighbourhoods

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

The LSP has been prepared in accordance with the principles and specific objectives of Liveable Neighbourhoods.

Planning for Bush Fire Protection Guidelines

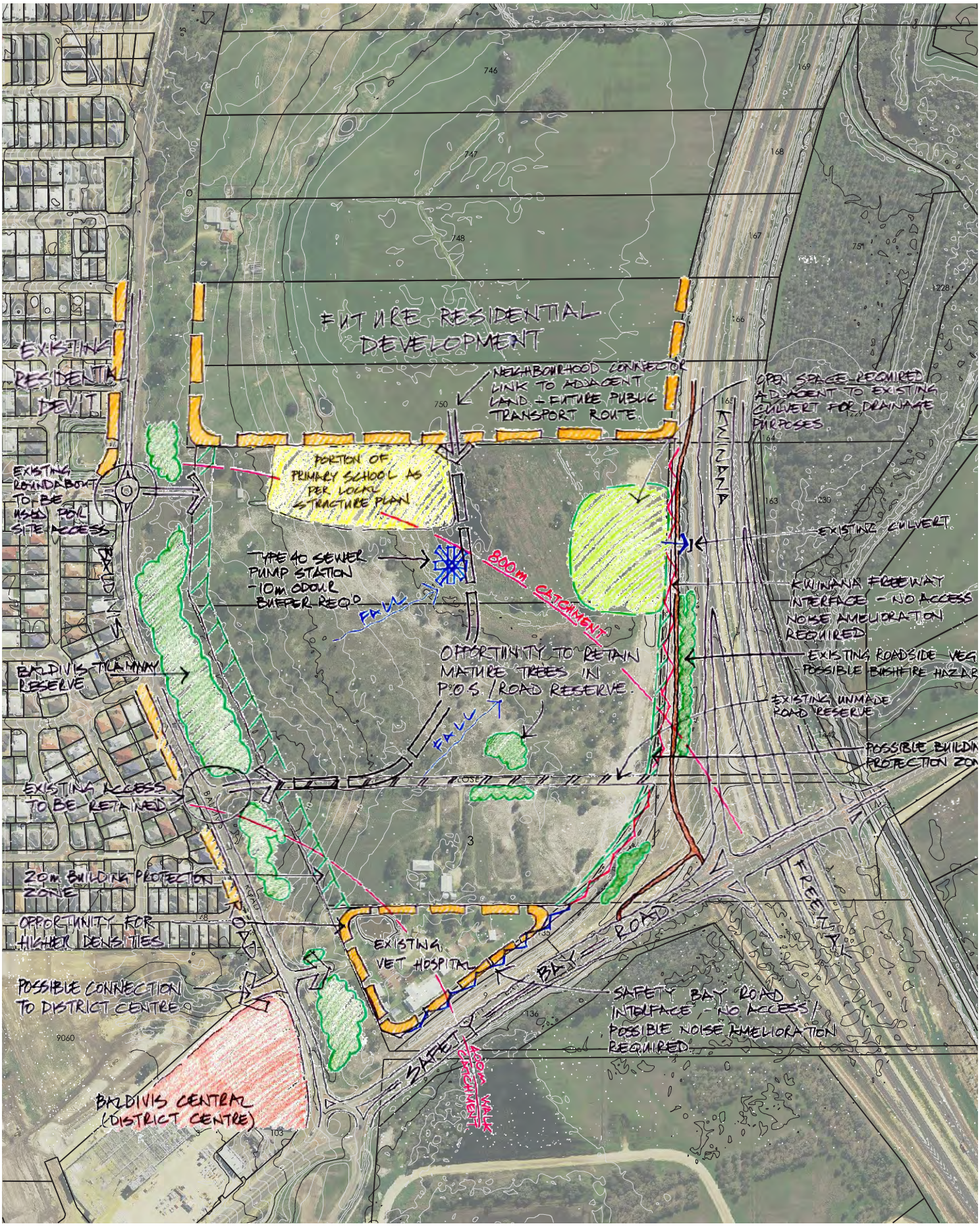
The WAPC and DFES released the Planning for Bush Fire Protection Guidelines in May 2010 as a means of outlining the matters that need to be addressed through the planning process in order to protect life and property in the event of a bush fire.

The LSP includes a Bush Fire Hazard Assessment, refer section 3.3 and Appendix 1, that has been prepared in accordance with the Guidelines.

1.3.5 Other Approvals and Decisions

In 2012, the landowners undertook a voluntary environmental referral to the (former) Federal Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

The DSEWPaC assessed the referral and set the level of assessment as 'Not a Controlled Action' under the EPBC Act 1999, demonstrating that the proposed urban development of the subject land is not considered to adversely impact on any 'Matters of National Environmental Significance'. The DSEWPaC referral addressed a number of fauna of conservation significance, including several black cockatoo species. The DSEWPaC's decision demonstrates that the development of the land will not have a significant impact on these protected species. A copy of the DSEWPaC advice is included as Appendix 8.



OPPORTUNITIES AND CONSTRAINTS

2304-106A-01 (23.10.2014), Not to scale

Figure 7

2.0 SITE CONDITIONS AND CONSTRAINTS

The following sections outline the site conditions and potential constraints apparent within the LSP area. This summary is informed by previous planning undertaken via the EBDSP, the various technical reports prepared in support of the EBDSP and the current technical inputs into the LSP. An opportunities and constraints map that summarises the following sections is Figure 7.

2.1 Biodiversity and Natural Area Assets

The LSP area is relatively unconstrained and the environmental factors affecting the land including groundwater, drainage, and bush fire management can be adequately managed via standard practices.

An Environmental Assessment Report has been undertaken for the LSP area by 360 Environmental and is included in full as Appendix 3. The Environmental Assessment Report demonstrates the suitability of the land for urban development as well as the lack of any significant environmental constraints.

2.1.1 Flora and Vegetation

The LSP area does not contain any Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs).

The condition of vegetation on site is classified as 'completely degraded' to 'degraded' based on the 'Bush forever vegetation condition scale' with a majority of the land dominated by weeds, with scattered stands of trees. There are opportunities to recognise some scattered pockets of woodlands within road reserves and public open space throughout the LSP area, subject to civil and drainage requirements.

2.1.2 Fauna

The majority of the LSP area has been cleared of vegetation and is in a 'completely degraded' to 'degraded' condition. This, combined with a lack of understorey means that little protected habitat is available to native fauna, particularly those of a ground dwelling nature.

Whilst no evidence was observed that indicated that Black Cockatoos roost on site, the area has been known to be utilised for foraging of Black Cockatoos. This factor is not significant as the tramway reserve adjacent the subject land will retain native vegetation post-development and will serve as an adequate habitat.

As noted above, the 2012 DSEWPaC decision to set the level of assessment as 'Not a Controlled Action' under the EPBC Act 1999 demonstrates that the urban development of the LSP is not considered to adversely impact on any 'Matter of National Environmental Significance'. The DSEWPaC referral addressed a number of fauna issues of conservation significance, including several black cockatoo species.

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2.2 Landform and Soils

2.2.1 Landform and Topography

The topography and soil types within the LSP area are similar to surrounding urban areas and are not constraints to development. The ultimate earthworks design will respect the current landform through the minimisation of retaining walls and recognition of the general fall of the site from west to east, whilst at the same time balancing the need to provide adequate clearance to groundwater and flood protection.

The LSP area slopes gently from west to east with maximum heights ranging from 9 – 13m AHD to 3 – 4m AHD in the north-east corner, with approximately 5 metres of fall across the site. The relatively flat nature of the site ensures that the site can be drained and serviced without the need for substantial earthworks, retaining, or significant changes to the topography / pre-development hydrology.

2.2.2 Soil Types

Soil types within the LSP area include Guildford Clay and Bassendean Sand and have good drainage capacity overall. The north-west corner of the LSP area consists of an isolated area of Guildford Clay which is primarily contained within lot 921. The remainder of the LSP area consists of Bassendean Sands. Further discussion on soil types and drainage is provided and the Local Water Management Strategy at Appendix 4.

The LSP is located in an area identified as 'moderate to low risk of ASS occurring within 3m of the natural soils surface (or deeper)' and is therefore suitable for urban development. An ASS Management Plan will be prepared in the usual manner prior to any excavation or dewatering as part of the subdivision.

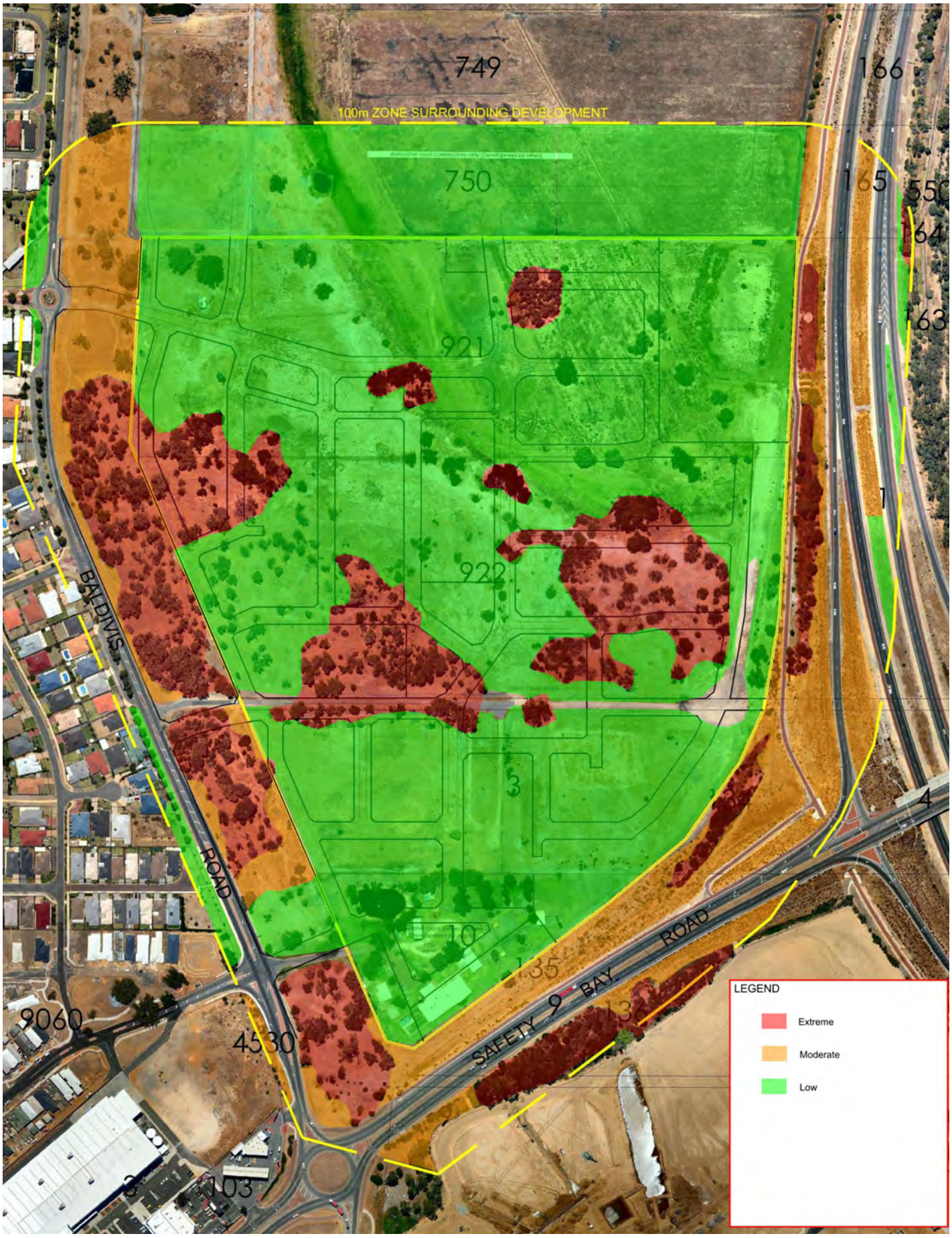
2.3 Groundwater and Surface Water

2.3.1 Existing Conditions

Management of ground and surface water is comprehensively addressed through the Local Water Management Strategy (LWMS) at Appendix 4, and is not a constraint to development. The LWMS is consistent with the DWMS, which was prepared by Parsons Brinkhoff in 2007(pre-dating the WAPC's Better Urban Water Management Framework) and accepted by the Department of Water.

The LSP area is underlain by an unconfined superficial aquifer that extends to a depth of -15m AHD. Groundwater levels across the site range from 3.8m AHD to 5m AHD, with a depth to ground water ranging from ponding at the surface in the north eastern portion of the site to greater than 3m along the western boundary of the site. Monitoring of groundwater at the site indicates that the groundwater below flows from southwest to northeast towards Folly Pool.

The majority of the land is Bassendean Sand, currently unsealed and mostly cleared of vegetation meaning rainwater is likely to infiltrate into the subsurface soil and recharge the superficial aquifer. Surface water runoff within areas of this type is unlikely, particularly given the low-lying nature of the site.



Source: Bushfire Safety Consulting

2304-119-01 (10.06.2014), Not to scale

BUSHFIRE HAZARD RATING

Figure 8

The LWMS and LSP will recognise pre-development flow rates to ensure that water quality and quantity is not adversely affected in downstream areas.

2.3.2 Wetlands and Waterways

There are no mapped 'Conservation' or 'Resource Enhancement' category wetlands within the LSP area. The north east corner of the Watson LSP area is mapped as 'Multiple Use' meaning that it has few attributes which still provide an important wetland function, with management objectives focused on use, development and management.

2.4 Bush Fire Hazard

In accordance with the WAPC's 'Planning for Bush Fire Protection Guidelines' and schedule 9 of TPS 2, a Bush Fire Hazard Assessment and Bushfire Management Plan has been prepared by Bushfire Safety Consulting and is included as Appendix 1. A Bush Fire Hazard Map is Figure 8.

The Assessment concludes that bush fire is not a constraint to development in the LSP area, subject to appropriate interface treatments and building protection zones being provided adjacent to the hazards identified. The LSP response to the identified bush fire hazards is discussed further in section 3.3.

2.5 Heritage

2.5.1 Aboriginal Heritage

The Department of Indigenous Affairs Aboriginal Heritage Sites database lists no registered Aboriginal heritage sites within the structure plan area.

2.5.2 European Heritage

The State Register of Heritage Places does not contain any heritage listings of European significance within the LSP area.

2.6 Other Land Use Opportunities and Constraints

2.6.1 Traffic Noise

A Transportation Noise Assessment has been prepared by Lloyd George Acoustics in accordance with SPP 5.4. The Assessment identifies that the eastern and southern portions of the LSP area are affected by traffic noise generated by the Kwinana Freeway. In this regard, the LSP area is no different from other urban development abutting the Kwinana Freeway and other high frequency traffic routes. Whilst noise attenuation is generally required, traffic noise is not a constraint to development and can be addressed via standard noise attenuation measures.

The Transportation Noise Assessment recommends that sound attenuation measures be implemented that include an increased boundary wall height of 2.1m where required, notifications being placed on the titles for lots that are exposed to higher levels of noise and 'quiet house design' for certain lots to assist in alleviating the freeway noise. The LSP response and noise attenuation is discussed further in section 3.6 and Appendix 2.

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2.6.2 Availability of Services and Infrastructure

Civil engineering consultants Wood & Grieve have been engaged to undertake a preliminary review of infrastructure requirements, including staging and funding requirements. Wood & Grieve has advised that the land is capable of being provided with essential services in a timely manner. This is reflected in the WAPC's recent decision to lift the 'Urban Deferred' status over the land. A detailed Earthworks and Servicing Strategy has been prepared by Wood & Grieve, refer section 3.10 for a summary of the servicing strategy, with a full copy provided as Appendix 5.

2.6.3 Baldivis District Centre

The Baldivis Activity Centre Structure Plan covers a 77.4ha area located immediately south-west of the LSP area, separated only by Baldivis Road and the Tramway Reserve. The immediate proximity of the activity centre to the subject land provides an excellent opportunity for medium density residential development in close proximity to essential services and employment opportunities. The LSP area is ideally located to deliver a mix of housing types and densities and will provide the Baldivis District Centre with the necessary population to drive and sustain commercial development.

2.6.4 Baldivis District Open Space

The East Baldivis District Structure Plan identifies an area of district open space adjacent to Zig Zag Road to the north of the LSP area. The district open space is colocated with a 9ha public high school and will provide an area for active recreation and organised sport which will be easily accessible via a neighbourhood connector road from the LSP area. Residential development of the LSP area and surrounds will provide a catalyst for the development and ongoing use of the district open space which will provide a long-term community benefit.

DEVELOPMENT CONCEPT PLAN

2304-122A-01 (10.11.2014), Not to scale

Figure 9

3.0 LAND USE AND SUBDIVISION REQUIREMENTS

3.1 Plan Overview and Land Use

The LSP delivers a robust and environmentally responsive residential development that recognises the broader context of the East Baldivis precinct, as well as its proximity to the Baldivis District Centre. The LSP is fully integrated with the land to the north, allowing opportunities for a consolidated and interconnected urban development.

The Development Concept Plan, shown as Figure 9, demonstrates one way the development could take place on the site, based on the structure plan principles and requirements. The Structure Plan Map, shown as Figure 10, is the statutory framework which will implement the Development Concept Plan. It is important to note that the Development Concept Plan represents only one manner in which development could occur and will be refined further at the time of subdivision.

The key principles of the LSP are to:

- Enable the creation of a diverse range of high quality housing choices that will appeal to a broad range of the market.
- Provide a robust urban form that responds to the site's location within the wider Baldivis locality and integrates with surrounding development.
- Recognise the natural amenity of the site through appropriate management and the recognition of existing vegetation within well planned open space.
- Provide accessible, attractive and multi-functional open space that addresses drainage requirements as well as offering a range of active and passive recreational opportunities.
- Extend the necessary services and infrastructure in a timely and coordinated manner to support the future development.

LEGEND

ZONES

- Residential - R25
- Residential - R40

RESERVES

- Public Open Space
- Public Purposes – Primary School

OTHER

- Structure Plan Boundary
- Primary Regional Road
- Other Regional Road
- District Distributor B
- Neighbourhood Connector
- Local Access Streets
- Noise Wall (1.8 - 2.1m)
- Quiet House Design (Package A)

Based on these key principles, the LSP provides the framework for:

- Approximately 390-400 dwellings across the structure plan area, with residential densities ranging from R25 to R40. Higher densities are focused around areas of high local amenity and closer to the district centre at the southern end of the LSP area.
- A centrally located local public open space measuring approximately 0.8 hectares that meets recreational objectives, whilst also creating opportunities to retain mature trees.
- A portion of a public primary school measuring approximately 2ha in area, with the balance being provided by the landowners to the north – consistent with the EBDSP.
- A permeable network of access roads that are responsive the existing road networks surrounding the structure plan area, whilst providing opportunities for integrated public transport, cyclist and pedestrian networks.
- A landscaping strategy that guides the development of the centrally located public open space, as well as providing an integrated drainage response.
- A management framework that identifies and responds to those land use opportunities and constraints described in Section 2.

Table 2: Public Open Space (POS) Schedule (all areas are in hectares) (Plan Ref 2304-94C-02)

Public Open Space Schedule (all areas are in hectares)		
Site Area		**27.60**
Deductions		
Portion of Primary School	2.11	
1:1 Year Drainage within POS	0.52	
Restricted Use (above 2%)		
TOTAL DEDUCTIONS	2.63	
Net Site Area		**24.97**
Other Deductions		
N/A		
Gross Subdivisible Area		24.97
POS @ 10%		2.50
Public Open Space Requirement May Comprise:		
Min 8% unrestricted POS	2.00	
Max 2% restricted POS	0.50	
TOTAL POS REQUIRED		2.50
Public Open Space Provided	***Unrestricted POS Area***	***Restricted POS Area***
1 POS A	1.38	0.18
2 POS B	0.83	0.00
3 POS C	0.10	0.00
4 POS D	0.03	0.00
TOTAL (ha)	**2.34**	**0.18**
Additional Deductions		
Restricted Open Space Surplus		0.00
Revised Gross Subdivisible Area		24.97
Revised POS @ 10%		2.50
Revised Public Open Space Contribution May Comprise:		
Min 8% unrestricted POS	2.34	9.38%
Max 2% restricted POS	0.18	0.72%
Total Creditable POS Provided	**2.52**	**10.10%**

Note 1: Gross Area is the total area of Lots 921, 922 Baldivis Road and Lot 3 Key Close

Note 2: In accordance with Liveable Neighbourhoods: the area subject to indunation more frequently than a one year average recurrance interval rainfall event is not included as restricted or unrestricted open space and is a deduction from the net site area (LN R33); areas for the detention of stormwater for a greater than one year average recurrance interval up to the five year recurrance interval is restricted open space up to 20%, the area greater than 20% is a deduction (LN R26); areas for the dentention of stormwater for a greater than five year average recurrance interval is within unrestricted open space (LN R25).

3.2 Open Space

3.2.1 Open Space Provision and Schedules

The LSP makes provision for approximately 3 ha of gross public open space across the LSP area. This includes a wide range of open space types including areas that enable passive and informal active recreation, vegetation retention, and integration into the broader Tramway Reserve.

Once Liveable Neighbourhoods credits are applied, the open space provision equates to 10% of the gross subdivisable area as shown in Table 2.

The following outlines the key aspects of public open space provision based on Liveable Neighbourhoods requirements, with the detailed description of each open space type outlined in Section 3.2.2 below.

- Based on a Gross Subdivisible Area (gross site area less 2 ha primary school and 1 in 1 year drainage storage area of 0.5 ha) of 25.08 ha, the 10% open space requirement is 2.51 ha.
- The LSP provides 3.0 ha of gross open space, with open space areas serving a shared drainage function, whilst not compromising the active and passive recreational uses.
- Approximately 0.52 ha of open space will receive drainage for events occurring more frequently than the 1 in 1 year (1 hour) event and as such, is a deduction from the Gross Subdivisible Area in accordance with Liveable Neighbourhoods.
- Liveable Neighbourhoods allows up to 2% of the 10% open space requirement to comprise of restricted use open space. The balance of restricted use open space becomes a deduction.
- Based on the requirements of Liveable Neighbourhoods, a maximum of 0.50 ha can be restricted use open space and a minimum of 2.01 ha unrestricted open space.
- In accordance with water sensitive urban design principles and the City's policies, the 1 in 1 to 1 in 5 year drainage event is treated as restricted use open space in accordance with Liveable Neighbourhoods. Approximately 0.18 ha of open space will receive drainage from the 1 in 1 year to 1 in 5 year drainage event in landscaped infiltration basins and bio-retention areas
- POS A is the only park that provides a drainage function for higher frequency events.
- Approximately 35% of POS A (0.7 ha) is required to accommodate higher frequency storm events up to the 1 in 10 year event. Whilst this area exceeds the 25% allowance as set out in LPP3.4.1, POS A remains a highly functional neighbourhood park, as demonstrated in Appendix 6.


Playground options for range of ages


Interactive play


Local plant species to drainage areas


Connection to Baldivis Tramway


Tree planting of various sizes to ensure long term shade to play spaces and turf


Meandering paths within the open spaces connecting with the broader path networks

Source: Emerge

2304-109A-01 (25.11.2014), Not to scale

PUBLIC OPEN SPACE MASTER PLAN

Figure 11

A Landscape Master Plan has been prepared by Emerge Associates as part of the LSP Plan. This Landscape Master Plan can be found in its entirety as Appendix 6, with a concept plan shown as Figure 11. Importantly, this Master Plan demonstrates that all areas of open space are useable and will allow for a range of informal active and passive uses, as well as providing an important drainage function by virtue of being at the low point of the catchment.

3.2.2 Description of Open Space Areas

The landscape strategy behind the public open space development is to provide a readily useable, aesthetic and liveable environment for future residents from day one. Landscaped open space areas will incorporate features and facilities to encourage residential growth and to provide a distinct site character and sense of place for residents.

The following provides a brief overview and description of the proposed landscape function, distribution and design throughout the LSP area.

POS A

POS A is located in the north eastern corner of the LSP area and is intended to primarily function as a passive recreation area, with an important drainage function for the LSP area and landholdings to the north.

POS A is aligned with an existing culvert that passes under the Kwinana Freeway and drains into the Peel Main Drain on the eastern side of the Freeway. It is a requirement of the Department of Water for development to match pre-development flow rates. POS A serves an important function in this regard, as outlined further in the LWMS at Appendix 4, by detaining and treating stormwater before allowing it to be discharged into the regional network.

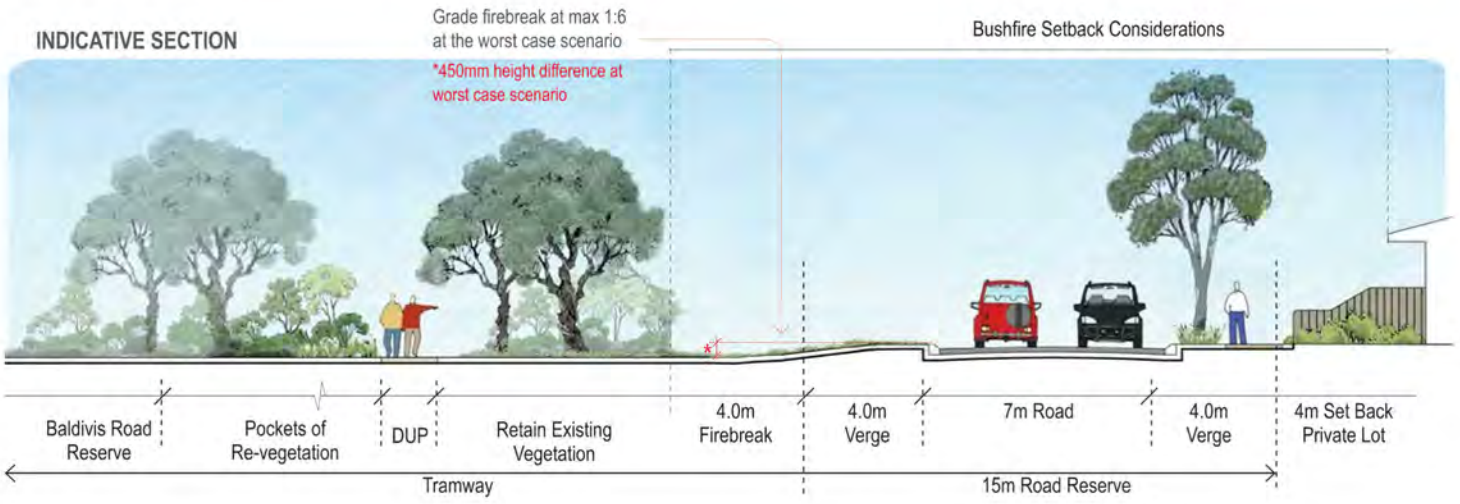
Despite its important role in the broader drainage network, POS A will be a highly useable, high amenity local park that maximises both aesthetic and functional uses, with more than 65% of the park not impacted by drainage.

POS A has been designed to be fully integrated with the adjoining landholdings to the north, where a further 0.3 ha of open space is proposed to abut POS A. The landscape architects and project hydrologists have been working closely with the developers to the north in order to ensure that POS A is a fully integrated, functional neighbourhood park.

POS B

POS B is a centrally located, high amenity local park that will provide the main community focal point for the southern portion of the LSP area. The park is designed around the retention of a number of large mature trees, as well as providing open areas for informal active recreation and / or play equipment. The park is overlooked on all sides by a variety of housing types, including traditional home sites and medium density housing, ensuring a high level of passive surveillance.

POS B does not form part of the drainage network for the LSP area and is unrestricted open space.



BUSHFIRE SEPARATION

The Bushfire Protection Zone (BPZ) and the Hazard Separation Zone (HSZ) are strategic zones which provide a buffer between the existing vegetation and the new residential area. The extent of the BPZ and HSZ are developed by a bushfire safety professional through the assessment of the existing vegetation and topography. A BPZ or HSZ will need to be considered along the extent of the Tramway considering the nature of the existing vegetation and the interface with the proposed adjacent residential lots.

A specific landscape treatment which considers tree canopy spread, plant selection, plant growth habit and ongoing maintenance requirements will be implemented to the eastern edge of the Tramway. The inclusion of a dual use path will also assist in providing the required separation of vegetation to the residential houses.

Linkage - Mark connection with Watson development

Meandering Pathway within Tramway

Pockets of Native Re-vegetation

Source: Emerge

2304-110A-01 (25.11.2014), Not to scale

BUILDING PROTECTION ZONE CROSS SECTION

Figure 12

POS C and D

POS C and D form local pocket parks along the western edge of the LSP area and provide 'breakout' areas from the adjacent Tramway Reserve. As demonstrated in the Landscape Masterplan at Appendix 6, these local parks will be fully integrated with the Tramway Reserve and as such, form part of a much larger regional open space network. POS C and D do not serve any drainage function and as such, are unrestricted open space.

3.3 Bush Fire Management

The LSP provides a comprehensive statutory and design response to address potential bush fire hazard, and demonstrates that bush fire risk over the site can be managed through a combination of dwelling setbacks and construction standards.

A Fire Management Plan (FMP) has been prepared by Bushfire Safety Consulting to support the LSP, refer Appendix 1. This FMP has been prepared in accordance with the WAPC's Planning for Bush Fire Protection Guidelines and includes a detailed Bush Fire Hazard Assessment which identifies those areas that are deemed to be Bushfire Prone. This Hazard Assessment demonstrates that the bush fire threat and hazard will be restricted to vegetation surrounding the perimeter of the site, namely the small amounts of retained remnant bushland to the west within the Baldivis Tramway Reserve and to a lesser extent the intermittent vegetation within the Kwinana Freeway Reserve.

The Bush Fire Hazard Assessment provides an indication of the setback distances required between dwellings and bush fire hazards (Building Protection Zone) to achieve a Bush Fire Attack Level (BAL) rating of 29 or lower. The LSP provides a Building Protection Zone (BPZ) of 20 metres from the western boundary of the LSP, adjacent to identified hazards. This 20m BPZ comprises of a combination of a minimum 15m wide road interface and building setbacks within the affected lots (to be controlled by Detailed Area Plans), refer Figure 12.

The Hazard Assessment also identifies bush fire hazards within the Kwinana Freeway reserve adjacent to the structure plan area. DFES outlines the specific approach to be applied to hazard mitigation for sites adjacent to freeway reserves in their December 2014 Information Note – "Construction Standards of New Homes at the Edge of the Freeway". The standardised approach is dependent on the placement of an acoustic wall at the freeway interface with the site, which will act as a shield against radiant heat flux levels produced by a bush fire within the vegetation of the reserve. The Information Note specifies that with an appropriate acoustic wall, BAL-12.5 can be achieved from 0-35m, with an altered form of BAL-LOW from 35-100m from the acoustic wall. This altered form of BAL-LOW (referred to as BAL-LOW (plus)) and provides for increased construction standards to the roof of dwellings only, in order to protect from ember attack up to 100 m (see Attachment 1 for further details).

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An acoustic wall is to be constructed at the eastern interface of the site with the Kwinana Freeway reserve, as a response to the acoustic implications of the adjacent freeway. This acoustic wall will also form a non-combustible barrier between the site and the adjacent hazard, and will provide a shielding effect from the radiant heat flux of a fire within classified vegetation east of the site, consistent with the DFES Information Note. Through the subdivision application process, accurate details regarding the height of dwellings in relation to the acoustic wall and management of Freeway vegetation will be produced, allowing for a detailed examination of the vertical shielding provided by the acoustic wall. This will form part of the detailed and specific BAL assessment undertaken at subdivision stage, and will influence the predicted radiant heat flux exposure of dwellings adjacent to the eastern boundary. A BPZ has been accommodated at this interface to ensure future residents plan and manage their garden vegetation to reduce the likelihood of embers igniting vegetation adjacent to a dwellings and localised flames threatening the building envelope. This setback is not required to reduce predicted radiant heat levels as this is provided by the shielding benefits of the acoustic wall.

Should any dwelling fall within the bush fire prone area, such dwellings may be subject to higher construction standards consistent with Australian Standards. Development within this precinct will need to be more closely examined at the subdivision design stage to determine whether higher dwelling construction costs will be required.

Bush fire construction standards, including any increased front setback areas will be implemented via DAPs as a condition of subdivision approval.

3.4 Residential

The LSP provides a structure for the delivery of a diverse range of housing, achieving residential density targets specified under state policy.

The delivery of quality housing is a key objective, ensuring the housing style and character reflects the amenity and attributes of the area. Key principles will be housing that addresses and surveys public spaces, incorporation of solar passive design principles for private outdoor living areas and ensuring garages / carports are appropriately located. This will be implemented through Detailed Area Plans, discussed in section 3.4.3, as well as potentially via Design Guidelines (to be determined by the proponent).

3.4.1 Dwelling Yields and Density Targets

The LSP provides the framework to deliver a range of densities, housing types and tenures to facilitate residential yields commensurate with the strategic and statutory planning framework, as well as the site's location within the broader district context.

The LSP has the potential to realise approximately 370 - 380 residential lots, or up to 460 dwellings, at densities ranging from R25 to R40, based on the following principles:

- The majority of the LSP area has a density code of R30, providing opportunities to deliver traditional front loaded lots, ranging in size from approximately 300 m^2 - 600 m^2.
- Lots fronting the Tramway Reserve are R25, recognising the need for a slightly larger front setback to provide a 20m BPZ.

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- Medium density R40 coded lots are located adjacent to the central open space, the planned primary school, as well as the southernmost portions of the LSP area, which fall within a walkable catchment of the Baldivis district centre. This coding provides opportunities to deliver contemporary cottage style housing with front or rear lane access, as well as grouped / multiple housing options. Single house lot sizes will generally range from 180 m^2 up to 360 m^2.

Directions 2031 and Beyond recommends a housing density target of 15 dwellings per gross urban zoned hectare. The need for density targets to encourage more efficient and effective housing is acknowledged. However, it is important that the application of these targets recognises the impact of site specific constraints on the ability to actually deliver density.

The LSP recognises the need to deliver specific densities and balances this with the recognition of a number of site specific environmental and land use constraints including:

- The 2ha portion of the primary school located within the LSP.
- Increased bush fire separation setbacks – typically accommodated through wider road reserves.
- The provision of POS in excess of the requirement necessary to accommodate and convey drainage.

Once these land constraints are taken into consideration, the actual developable residential area is considerably less than the gross urban area.

In addition, consistent with the existing strategic planning framework, the LSP does not include any provision for activity centres, rail stations or employment generators which would warrant a higher density response.

Notwithstanding, the LSP delivers the potential for approximately 15 dwellings per gross urban hectare, once the 2ha primary school and open space exceeding 10% is deducted from the urban zoned area. This density is commensurate with the broader context in which the site is located.

3.4.2 Lot / Dwelling Types

A diverse mix of lot and housing typologies will be achieved. There may be opportunities for the proponent to build out pockets of medium density housing to deliver a range of housing types and amenity. The following provides a brief description of the housing typologies that could be delivered within the LSP area.

Traditional Home Site Examples

TRADITIONAL HOME SITES	
Typical Width	17m+
Typical Depth	30m+
Area	600m^2 to 900m^2
Residential Density Code	• Residential R25 - R30
Built Form Control	• Residential Design Codes • Design Guidelines
Built Form Delivery	• Single dwellings • Typically sold as land only

Contemporary Front Loaded Lot Examples

CONTEMPORARY FRONT LOADED LOTS	
Typical Width	12.5m -17m
Typical Depth	• 30m • 20 - 25m
Area	300m^2 to 600m^2
Residential Density Code	• Residential R25 - R30
Built Form Control	• Residential Design Codes • Detailed Area Plans
Built Form Delivery	• Single dwellings • Typically sold as land only

Cottage Lot Housing Examples

COTTAGE LOT HOUSING	
Typical Width	7.5m - 12m
Typical Depth	28m to 30m
Area	210m^2 to 360m^2
Lane access	Rear laneway provided for vehicular access
Residential Density Code	• Residential R40
Built Form Control	• Residential Design Codes • Detailed Area Plans
Built Form Character and Delivery	• Single and grouped dwellings • Potential for studios over garages • Lots less than 10m wide typically built out and sold as a house and land package • Opportunities for innovative delivery of housing on narrow lots • Opportunities for terrace housing abutting POS and Primary School

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3.4.3 Variations to the Residential Design Codes

On 8 May 2015, the WAPC released Planning Bulleting 112/2015 (PB112/2015) which outlined acceptable residential development standards for medium density single houses in structure plan areas.

PB112/2015 sets out a range of acceptable development standards, indicating that these will be considered as 'deemed to comply' standards subject to being inserted into an operating Structure Plan. The LSP includes the RMD25 and RMD40 within the Part 1 Statutory Report. Table 1 (Residential Medium Density Codes) sets out variations to the Residential Design Codes that are deemed to constitute 'deemed-to-comply' development within the Structure Plan area and which do not therefore, require neighbour consultation and planning approval.

It is intended that the provisions set out in Table 1 (Residential Medium Density Codes) act as a replacement to existing R-Codes standards for building and garage setbacks (Clauses 5.1.2, 5.1.3 and 5.2.1), open space (Clause 5.1.4), parking (Clause 5.3.3), visual privacy (Clause 5.4.1) and solar access (Clause 5.4.2). All other R-Codes standards apply, where relevant to the proposal, including site area (Clause 5.1.1); building height (Clause 5.1.6); street surveillance, walls, fences and sightlines (Clauses 5.2.3 to 5.2.5); parking space design and vehicular access (Clauses 5.3.4 and 5.3.5); site works, retaining walls and stormwater management (Clauses 5.3.7 to 5.3.9); and outbuildings, external fixtures and utilities and facilities (Clauses 5.4.3 to 5.4.5).

The density code numbers shown on the Structure Plan Map are to correspond with the associated RMD Code number within Table 1.

Source: Transcore

2304-113A-01 (07.11.2014), Not to scale

ROAD HIERARCHY PLAN

Figure 13

3.5 Movement Networks

A Transport Assessment has been prepared by traffic consultants, Transcore to identify projected traffic volumes and suggested road hierarchies in and adjacent the site, refer Appendix 7. The key findings are summarised in the following sections.

The Transcore assessment is entirely consistent with the land use and traffic principles established via the EBDSP and refines these principles in the LSP to produce a more comprehensive overview of the traffic network.

3.5.1 Regional Road Network

The LSP and broader East Baldivis cell is well supported by an existing and planned regional road network.

- **Kwinana Freeway** is classified as a Primary Distributor and is reserved as a Primary Regional Road in the MRS. The closest freeway interchanges are at Safety Bay Road, just to the south of the LSP area and at Mundijong Road, 3km north of the LSP area.
- **Safety Bay Road** and **Mundijong Road** provide key east-west links connecting key employment areas to the Kwinana Freeway. Both roads are reserved as Other Regional Roads in the MRS.
- **Baldivis Road** is constructed as a single carriageway, two-lane, rural road providing north south access through Baldivis for connections to the Kwinana Freeway at Mundijong Road, Safety Bay Road and Karnup Road. Baldivis Road currently carries approximately 6,500 vehicles per day. Consistent with the EBDSP, Transcore identifies Baldivis Road as a future District Distributor B road, carrying approximately 13,000 – 14,000vpd adjacent to the LSP area.
- **Nairn Drive** is planned to form the main north south district distributor road through Baldivis and Karnup, and is reserved as 'Other Regional Road' (also referred to as a blue road) in the MRS.

The LSP recognises and respects the planned regional road network and ensures that its operation will not be unduly compromised through the inclusion of excessive traffic volumes or vehicle access points.

3.5.2 District, Neighbourhood and Local Road Network

The LSP proposes a comprehensive district, neighbourhood and local road network, that is consistent with the EBDSP and Liveable Neighbourhoods, refer Figure 13, road hierarchy plan. The LSP road network is based on the following key principles:

- Identification of Baldivis Road as a District Distributor B road, with a forecast daily traffic volume of 13,000 – 14,000 vpd at full development.
- A central north-south Neighbourhood Connector B road connecting the southernmost access to the LSP area from Baldivis Road and extending through the centre of the LSP area to connect to the development cells to the north. This Neighbourhood Connector B road is forecast to carry approximately 1,000 – 2,000 vpd at full development and has an indicative reserve width of 18m consistent with Figure 18 of Liveable Neighbourhoods (element 4) which allows for a reduced verge width from 6.2m to 5.5m to reduce overall reserve to 18m. This reduced verge width is appropriate in this instance, as traffic volumes are sufficiently low to enable direct lot access, negating the need to provide formal verge parking. Given the absence of verge parking, the reduced verge width of 5.5m is entirely appropriate in this instance.

Source: Transcore

2304-114A-01 (07.11.2014), Not to scale

INTERSECTION TREATMENTS

Figure 14

- Access points to Baldivis Road at Key Close (existing) and opposite existing Mennok Approach in the south of the LSP area and Tamworth Boulevard further to the north. The Tamworth Blvd and Mennok Place intersections will form four-way connections, most likely controlled via a single lane roundabout on Baldivis Road. Further intersection analysis is provided in section 3.7.3 below.
- A permeable grid of local access streets with indicative reserve widths of 15m-18m (13m adjoining POS), including higher order access streets surrounding the southern and western sides of the planned primary school. The precise location and alignment of local access streets will be determined at subdivision stage as part of further detailed design.

3.5.3 Intersection Analysis

Baldivis Road Intersections

The LSP provides safe and efficient access to the regional road network via Baldivis Road. Access to the LSP area will be provided by two 4-way intersections on Baldivis Road, at Tamworth Boulevard and at Mennock Approach and a priority T intersection at Key Close. The LSP access arrangements are further demonstrated in Figure 14.

Capacity analysis of these intersections has been undertaken by Transcore using the SIDRA computer software package. SIDRA is an intersection modelling tool commonly used by traffic engineers for all types of intersections.

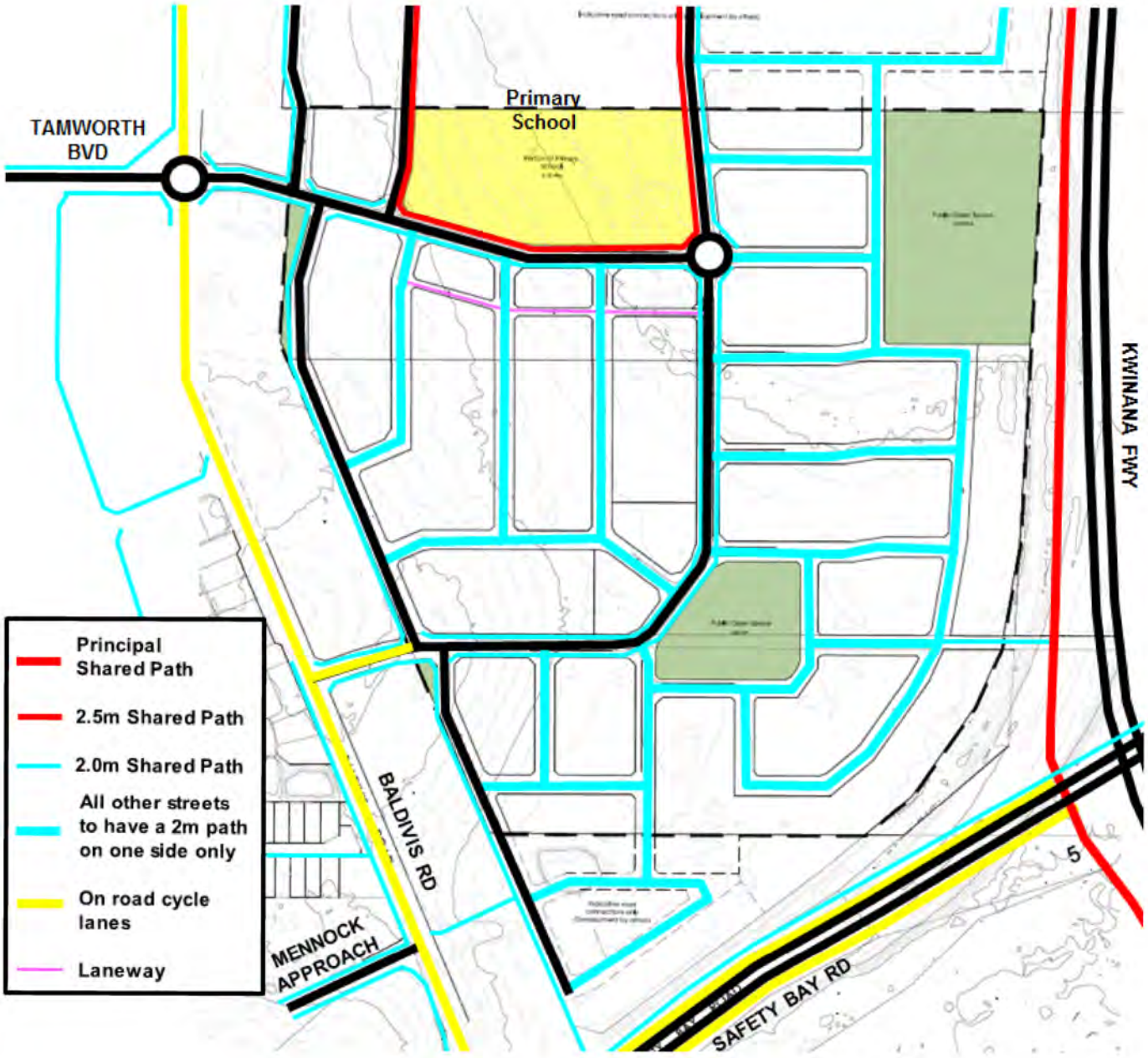
The SIDRA analysis indicates that the proposed roundabout at the intersection of Baldivis Road/Mennock Approach will operate satisfactorily in both peak periods with the forecast traffic flows for full development of Baldivis. This roundabout will operate at level of service (LOS) A overall (the best possible level of service in this type of analysis) and the through movements on Baldivis Road will all operate at level of service A with average delays less than 10 seconds in both peak hours. All movements will be at level of service A or B (very good).

Considering that the projected traffic volumes at the Baldivis Road/Tamworth Boulevard roundabout are much lower than the intersection of Baldivis Road/Mennock Approach, it is expected that the proposed roundabout of Baldivis Road/ Tamworth Boulevard will also work satisfactorily during the peak hours in the full development future scenario that has been modelled.

SIDRA analysis for the intersection of Key Close/Baldivis Road indicates that this intersection will work satisfactorily and well within capacity with LOS A for the Baldivis Road approaches. In order to satisfy Austroads requirements and improve safety and amenity of the intersection, turn lanes of approximately 100m are recommended for the left and right turns on Baldivis Road.

Internal Intersections

The precise nature and function of all internal intersections will be determined at detailed design stage once the location and alignment of local roads is determined. Generally speaking, any 4 way intersections will be roundabout controlled and intersection spacings and treatments will be consistent with Liveable Neighbourhoods requirements.



Source: Transcore

2304-115A-01 (07.11.2014), Not to scale

PEDESTRIAN AND CYCLE NETWORK

Figure 15

3.5.4 Public Transport

The LSP road network is capable of supporting an internal bus network consistent with that identified as part of the EBDSP. The planned Neighbourhood Connector B road provides sufficient pavement and reserve width to accommodate future bus-related infrastructure commensurate with the surrounding urban environment. Once operational, approximately 90% of all dwellings within the LSP area will be within 400m of the planned bus route.

At present the closest existing bus route to the LSP area is Bus Route 568 from Warnbro train station, which currently terminates at Nairn Drive / Kingaroy Drive. The closest bus stops are on Tamworth Boulevard or Pemberton Boulevard in close proximity of the LSP area.

Bus route 568 provides an hourly service Monday to Friday between 5.30am and 9pm (with more frequent service in the peak direction in AM and PM peak periods) and hourly on Saturday and Sunday from 7 or 8am to 7pm, approximately.

A deviation of route 568 links to the Baldivis district centre on Safety Bay Road. This deviation operates from approximately 8.30am to 4pm on weekdays, 8am to 5pm on Saturdays and 11am to 5pm on Sundays.

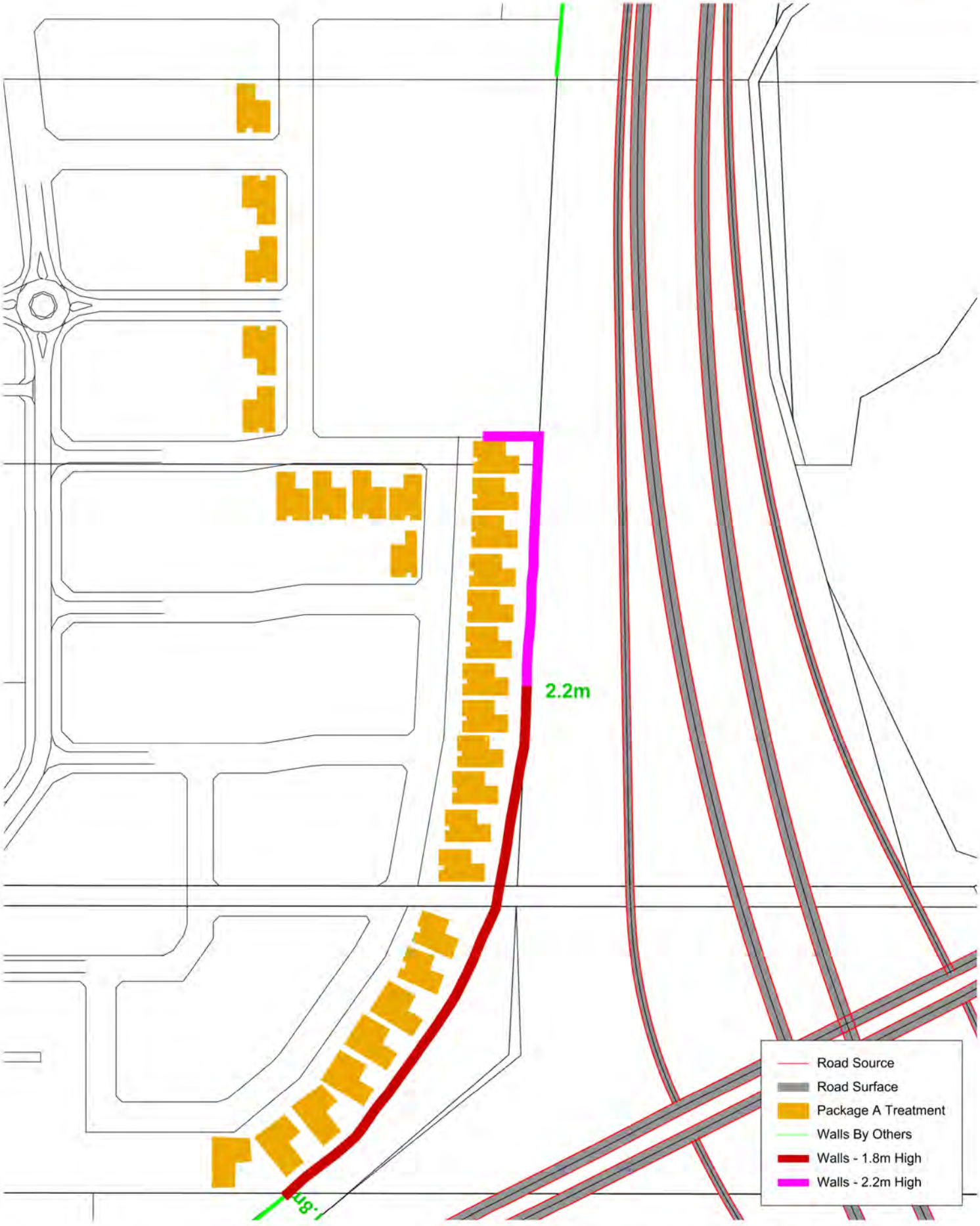
The EBDSP identifies an opportunity for a central north-south bus route through the centre of the DSP area. The LSP recognises this and ensures that the alignment and width of the central neighbourhood connector is appropriate to accommodate bus traffic in the future once the route becomes operational.

3.5.5 Cycling and Pedestrian Movement

The LSP delivers a highly permeable road network within the LSP area, creating excellent opportunities for the provision of good pedestrian and cyclist facilities that maximise the use of non-motorised transport modes. The proposed pedestrian and cyclist network for the LSP area is shown at Figure 15.

The precise location and alignment of footpaths and shared paths will be determined in consultation with the City of Rockingham as part of detailed civil design following subdivision approval and will generally be provided in accordance with the following principles:

- Paths will be provided on at least one side of all roads;
- There will be paths on both sides on Integrator Arterial and Neighbourhood Connector roads. A shared path will be provided within the Tramway Reserve, parallel with Baldivis Road and will connect to the development cells to the north; and
- Consistent with Liveable Neighbourhoods, there are no formalised on-street cycle lanes within the LSP area. On-street cycle lanes are normally included on Integrator A, Integrator B and Neighbourhood Connector A roads – none of which are proposed as part of this LSP.



Source: Lloyd George Acoustics

2304-116A-01 (10.11.2014), Not to scale

NOISE MITIGATION TO COMPLY WITH SPP5.4

Figure 16

3.6 Acoustic Considerations

As noted above, the LSP shares boundaries with the Kwinana Freeway and Safety Bay Road, both of which are Primary Regional Roads carrying significant amounts of traffic. As such, impacts of traffic noise must be taken into consideration in accordance with State Planning Policy 5.4 and TPS2.

A Transportation Noise Assessment has been prepared by Lloyd George Acoustics in support of the LSP, a copy of which is included as Appendix 2. Lloyd George Acoustics concludes that subject to the inclusion of some noise mitigation treatments as part of the ongoing development of the LSP area, traffic noise is not a constraint to development of the LSP. These noise mitigation measures are depicted on Figure 16, and include:

- A boundary wall of 1.8 metres fronting Safety Bay Road and the southern portion of the Kwinana Freeway, increasing to 2.2 metres towards the north of the LSP area;
- A statutory provision requiring those lots that are deemed to exceed the 'target' noise level to have a notification on titles at subdivision stage advising of a hazard; and
- A statutory provision requiring dwellings located on those lots exceeding the 'target' to incorporate 'Package A' quiet house design treatments, as set out in Appendix 2.

The Package A quiet house design requirements will be implemented via DAPs as a condition of subdivision.

3.7 Water Management

The LSP provides a comprehensive planning and design response to address all aspects of urban water management. A Local Water Management Strategy (LWMS) has been prepared by JDA Consultant Hydrologists, and is included as Appendix 4 to the LSP. The LWMS addresses the requirements of the WAPC's Better Urban Water Management Guidelines, and is a refinement of the existing regional and district level water strategies for this area.

3.7.1 Existing Water and Drainage Strategies

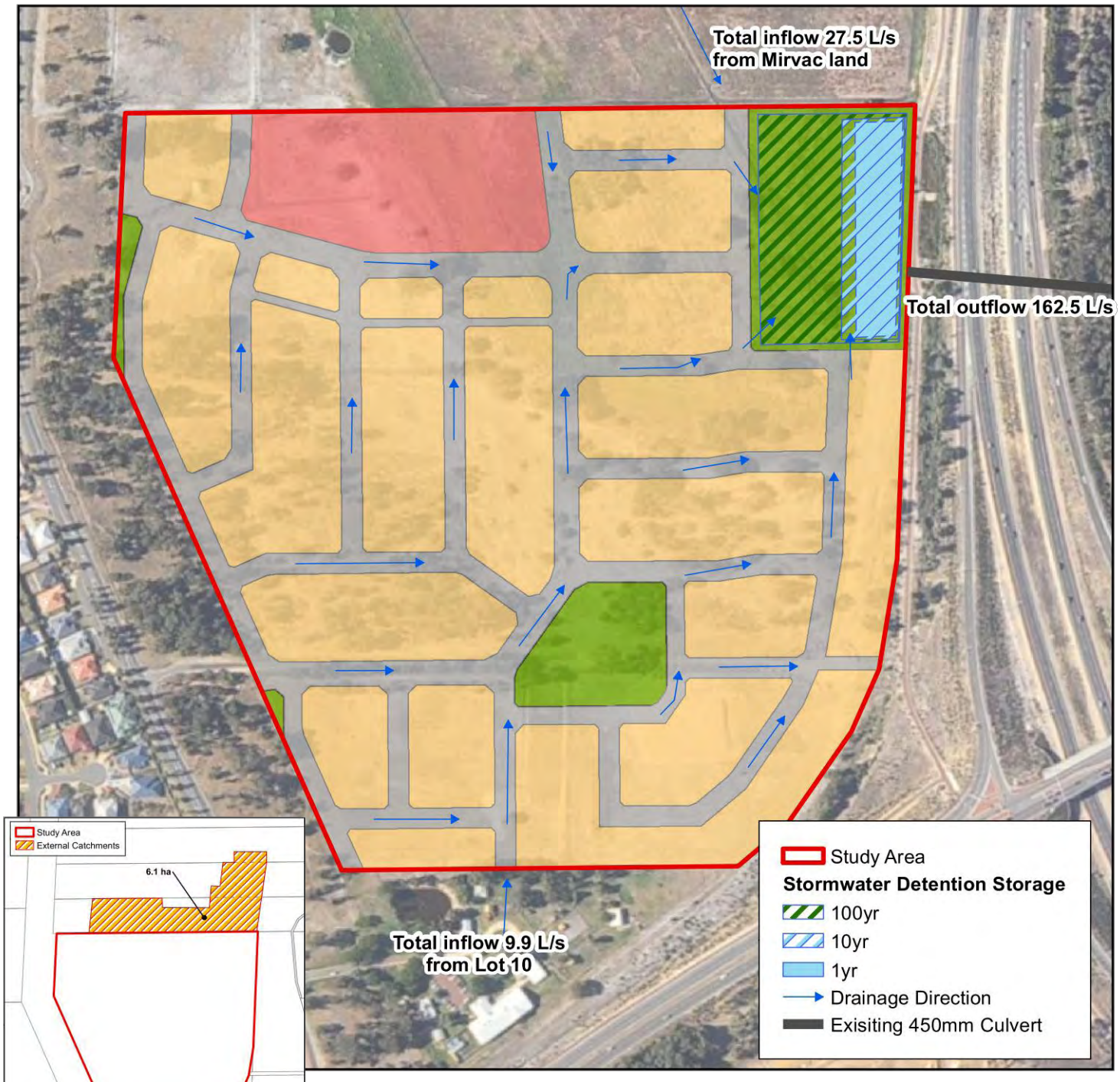
North-east Baldivis Flood Modelling and Drainage Studies (DoW, 2014)

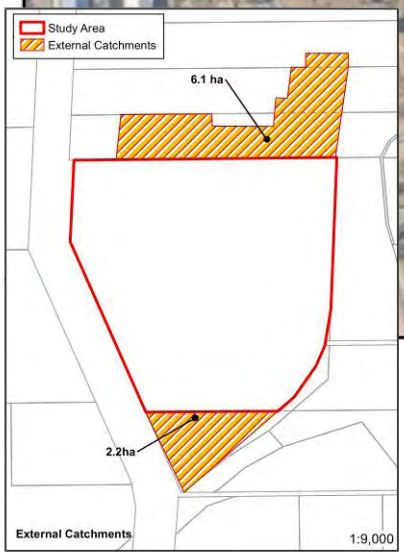
The Department of Water was commissioned by the Department of Planning to develop a hydraulic flood model for sections of the Peel, Serpentine and Birriga Main Drains. The LWMS is consistent with the relevant principles of the flood modelling and drainage study.

East Baldivis District Water Management Strategy (Parsons Brinkerhoff, 2007)

The East Baldivis DWMS was prepared in support of the East Baldivis District Structure Plan and has been endorsed by the Department of Water.

The LWMS has been prepared in accordance with the key objectives and principles of the DWMS and refines these principles to a local scale consistent with the WAPC's Better Urban Water Management Guidelines.





Source: JDA

2304-117A-01 (12.11.2014), Not to scale

CATCHMENT AND STORMWATER MANAGEMENT PLAN

Figure 17

3.7.2 Local Water Management Strategy Overview

The LSP provides a framework that allows for best practice urban water management and remains sensitive to the existing hydrology and natural environment.

This framework emphasises the application of water sensitive urban design to manage the way in which water within an urban context is utilised. This type of design aims to minimise the impact of urbanisation on the natural water cycle.

A Local Water Management Strategy (LWMS) has been prepared by JDA and is included as Appendix 4, while Figure 17 depicts the Catchment and Stormwater Management Plan for the LSP area. The LWMS demonstrates in detail how the LSP addresses urban water management and water sensitive urban design. The key principles of the LWMS are:

Surface Water Management

- Post-development critical 100 yr ARI peak flow will be consistent with pre-development peak flow at the discharge point of each sub-catchment and discharge points of all subdivisions into waterways.
- 1 yr 1 hr ARI event runoff will be treated at source where possible.
- Drain re-alignment or profile modification may be carried out if the pre-development hydraulic capacity has been maintained.
- Manage surface water flows from major events to protect infrastructure and assets from flooding and inundation.

Groundwater Management

- Managing and minimising changes in groundwater levels and groundwater quality following development.
- Subsurface drainage (sub-soils) and drainage infrastructure set at or above the groundwater design level, although existing inverts below this level may remain.
- Installed subsoil drainage outlets to be free draining.

Monitoring and Implementation

- Design based on methodology in Stormwater Management Manual of adopting a treatment drain including:
  - structural treatment measures (infiltration storages, plus bio-retention/ treatment structures sized to min 2% of connected impervious area);
  - non-structural measures to reduce applied nutrient loads.
- Maintain groundwater quality at pre-development levels (median winter concentrations) and, if possible, improve the quality of water leaving the development area to maintain and restore ecological systems

Water Conservation

- Aim to achieve the State Water Plan target for water use of 100 kL/person/yr.
- Consider alternative fit for purpose water sources where appropriate and cost-effective.

PRIMARY SCHOOL CONCEPT

2304-107-01 (26.03.2014), Not to scale

Figure 18

3.8 Education Facilities

The LSP recognises that education facilities form an important part of the community infrastructure provision within the LSP area and provide a focal point for the surrounding residential community.

The EBDSP establishes the number and distribution of primary and secondary schools throughout the DSP area. This distribution has been confirmed in consultation with the Department of Education, with the school sites being centrally located within the surrounding catchment, consistent with Liveable Neighbourhoods.

3.8.1 High Schools

The EBDSP identifies a 9ha public high school site adjacent to Zig Zag Road, approximately 2km north of the LSP area. It is intended that this high school will service the LSP area at ultimate development. In the interim period until this high school is developed, residents of the LSP area have convenient access to the existing public high school to the south of Safety Bay Road within the 'Rivergums' estate.

3.8.2 Primary Schools

The EBDSP identifies three public primary schools within the DSP area, distributed evenly along a north-south axis through the DSP area. A portion of the southernmost primary school site is shown within the LSP area, with the balance of the site shared within the landholding to the north of the LSP.

Consistent with the EBDSP, the LSP provides a 2ha portion of the primary school site, with the balance to be provided by the landowners to the north, refer Figure 18 – Primary School Concept.

TYPICAL PLAN

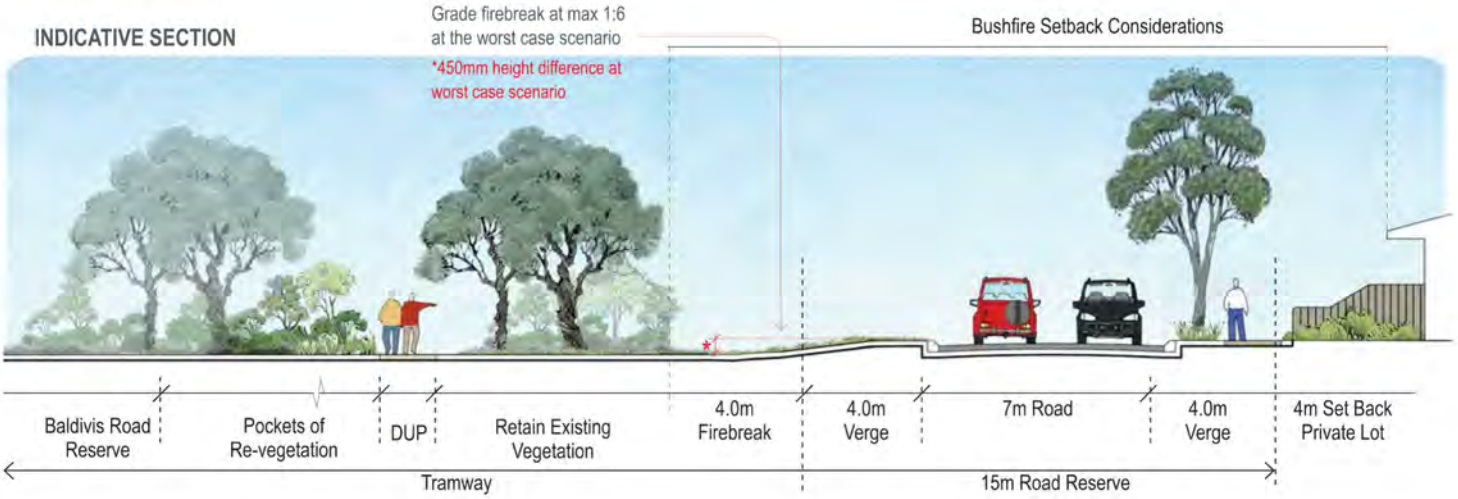
TRAMWAY RESERVE

The Tramway is a vegetated corridor that extends north/south along the western side of the Lot Number 3, 10, 921, 922 Baldivis Road and Key Close site, and is part of the broader Tramway corridor through the Baldivis area. The City of Rockingham is undertaking a broad review and masterplan of the entire Tramway which may further inform the development of the tramway in the future.

At this stage the project intends to undertake the following:

- Maintain and protect the existing vegetation within the Tramway reserve
- Re-vegetate strategic areas of the Tramway that are degraded, with endemic non-irrigated planting
- Weed eradication and selective tree pruning
- Implementation of a dual use path which will connect to the broader Tramway pedestrian network
- Create feature entry zones, through the implementation of possible entry structure/artwork and feature irrigated planting.
- The development site will have fill installed to create appropriate workable finished lot levels. The tramway vegetation will be retained at its existing levels. Principally the vast majority of the interface between the Tramway and the development will be created to match in to avoid any level changes however preliminary earthworks plans indicate a max 450mm level difference in one location on the interface between the higher development and the lower tramway. This local worst case 450mm level difference will be managed via being evenly battered at max 1:6 grade across part of the firebreak track to avoid any disturbance to existing tramway vegetation while still allowing emergency vehicle access along the firebreak and avoiding the need for retaining walls which impede easy access.

INDICATIVE SECTION



Source: Emerge

2304-162-01 (25.11.2014), Not to scale

TRAMWAY CROSS SECTION

Figure 19

3.9 Activity Centres and Employment

The LSP area has excellent access to nearby activity centres and employment opportunities, as recognised by the EBDSP.

The LSP is located approximately 400m – 1km from the Baldivis Town Centre – a 'District Centre' as designated via State Planning Policy 4.2 – Activity Centres for Perth and Peel. The Baldivis District Centre will provide for the day to day retail and community needs of future residents of the LSP area, as well as providing employment opportunities for a small proportion of the population. The Rockingham Strategic Metropolitan Centre and Kwinana Secondary Centre are also easily accessible to the LSP area and will provide for a wider range of commercial, community and employment opportunities.

There are a number of major existing employment nodes in the Rockingham and Kwinana areas including the Western Trade Coast, Kwinana Industrial Area, Australian Marine Complex and Jandakot airport. In addition, there are expansive areas of planned industrial development including the Latitude 32 industrial area, North-East Baldivis and East Rockingham. Development of the LSP area is a logical solution to increasing the local employment catchment, which is critical to achieving the employment self sufficiency targets set by Directions 2031 and Beyond.

3.10 Infrastructure Coordination, Servicing and Staging

Civil engineering consultants Wood & Grieve have prepared a detailed earthworks and servicing strategy demonstrating the availability of service infrastructure to the LSP area. The strategy is summarised below and is provided in full as Appendix 5. The Strategy demonstrates that essential services are readily available and the provision of services to the LSP area is not a constraint to development.

Further detailed infrastructure planning and design will occur as the planning and development of the land progresses.

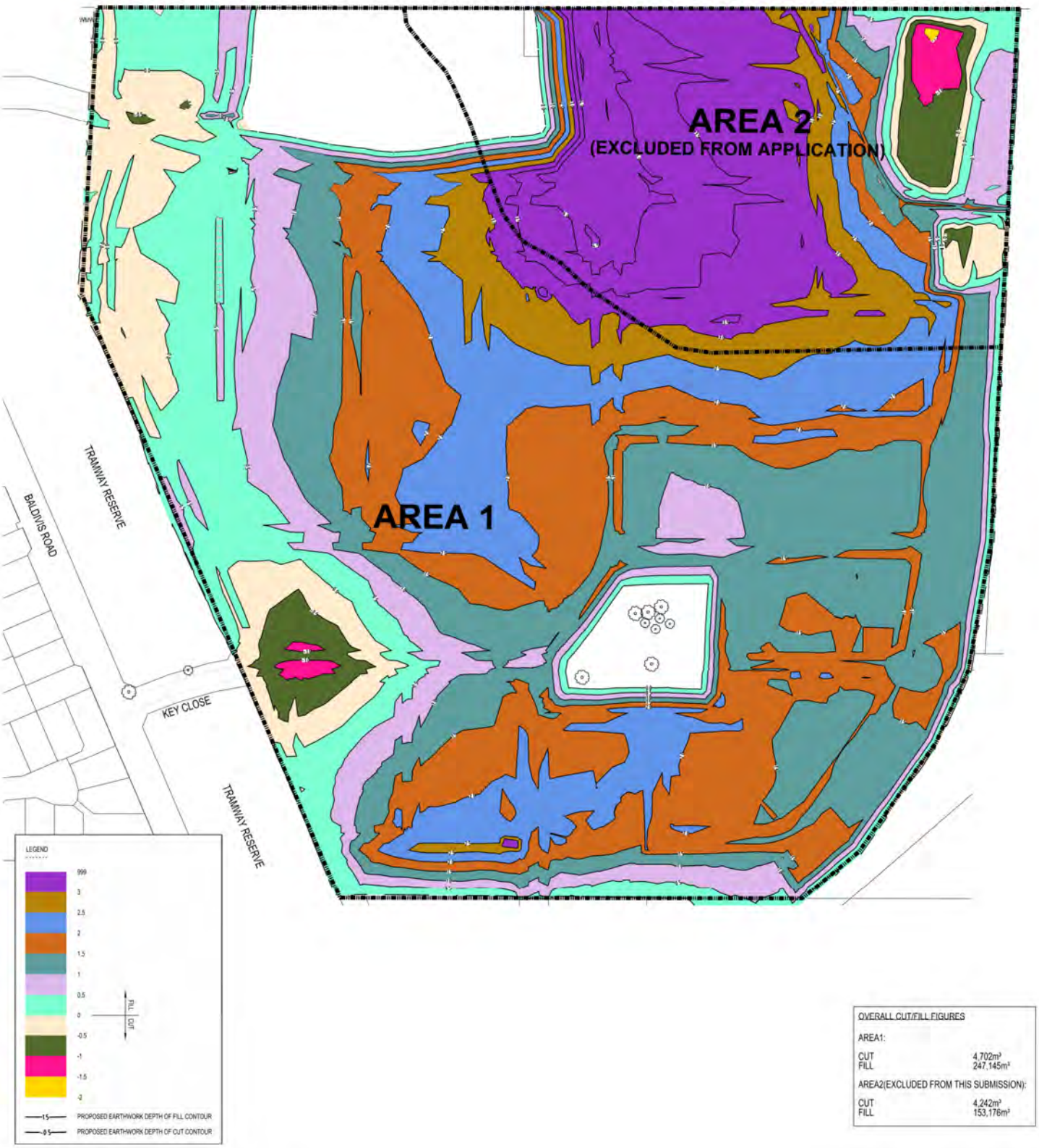
3.10.1 Earthworks

Like the rest of the East Baldivis cell, the final earthworks levels for the site are a complex combination of geotechnical, hydrological, planning, environmental, engineering design and marketing factors.

The existing topography of the site falls from west to east at a 1 in 50 grade. The gradient provides the LSP area with the flexibility to orientate the home sites to suit passive solar orientation and to facilitate the drainage from west to east.

The LSP design has paid particular attention to matching the existing levels along the western boundary to enable retention of trees within the tramway reserve, as well as matching the existing levels at the other boundaries of the site. A preliminary cross section showing the interface between the subject site and the Tramway Reserve is shown at Figure 19.

A geotechnical report has previously been undertaken for the site by Coffey Geotechnics. It is intended that the final lot classification for the site will generally be Class A with the exception of the north eastern corner of the LSP area which achieve Class S. All lot classifications will be in accordance with AS2870-2011.



OVERALL CUT/FILL FIGURES	
AREA1:	
CUT	4,702m³
FILL	247,145m³
AREA2(EXCLUDED FROM THIS SUBMISSION):	
CUT	4,242m³
FILL	153,176m³

Source: Wood & Grieve Engineers

2304-118A-01 (12.11.2014), Not to scale

EARTHWORKS STRATEGY

Figure 20

Market forces also presently dictate the provision of flat building sites with retaining walls to accommodate level differences. Lots will be designed with a maximum of 500mm front elevation from the verge level, with retaining walls installed for greater elevations.

Final earthwork levels will need to ensure adequate clearance to the 100 year flood level in the Peel Main Drain, as well as providing adequate clearance to 1 in 100 year ARI storm event flood levels and ensuring roadway geometrical design incorporates flood routing constraints. Sufficient site levels will be required to be provided for the operation of gravity sewer connections.

The City of Rockinham granted planning approval for bulk earthworks across the structure plan area in June 2014. The approved 'Cut to Fill' bulk earthworks plan is Figure 20.

3.10.2 Wastewater

It is important to note that all surface run off from the structure plan area will be contained and treated on site, and will not discharge into adjoining lots.

The LSP area is included within the Water Corporation's current waste water planning for the Baldivis area, with the Water Corporation recently confirming that they are prepared to support urban development within East Baldivis on the understanding that the new Waste Water Treatment Plant (WWTP) in East Rockingham will be operational by the end of 2015, which is commensurate with the timing of development of the LSP area.

Disposal of wastewater within the subject land will be achieved via a network of gravity reticulation sewers discharging into branch and collection sewers gravitating to a proposed wastewater pumping station located at the northern portion of the site.

The Water Corporation's current sewer planning indicates that a Type 40 wastewater pumping station would be required for the development, with a DN150 offsite pressure main discharging to Water Corporation infrastructure. The LSP provides a suitable site for the sewer pumping station to suit the Water Corporation's requirements.

3.10.3 Water Supply

Provision of a potable water supply to the project will be achieved by the extension of water distribution mains to the project site, with individual lots serviced by a network of water reticulation mains in the usual manner.

The grid like nature of the LSP concept road network provides for an efficient project water main design layout.

3.10.4 Electrical Supply

Existing overhead high voltage infrastructure located in Baldivis Road will be utilised to provide a high voltage power supply to the LSP area.

An underground network will be progressively constructed through the proposed subdivision with switchgear and transformers located about the LSP area to feed the low voltage internal underground power cables connecting to each lot.

Existing overhead powerlines along existing roads within the proposed subdivision would be progressively undergrounded in accordance with current practice.

PRELIMINARY STAGING PLAN

2304-158-01 (10.11.2014), Not to scale

Figure 21

3.10.5 Development Staging

It is anticipated that the structure plan area will be developed in stages over a period of 12-24 months. Initial stages will include key infrastructure items including access and intersections to Baldivis Road, POS A and the southern portion of the Neighbourhood Connector road. A preliminary staging plan is included as Figure 21.

The provision of civil infrastructure will be staged to suit development demand and precise timing and staging of development will be confirmed at detailed design stage.

3.10.6 Telecommunications

The size of the LSP area indicates that this development will be within the NBN footprint. An underground network of NBN cabling (in a common trench with underground power) will be progressively constructed through the proposed subdivision with fibre distribution hubs located about the site as required.

It is envisaged that telecommunications for the development area would be provided by connection to Telstra's Baldivis Exchange located in Baldivis Road, to the north of the LSP area.

3.10.7 Gas

The site is currently serviced by an existing DN160 high-pressure gas main located in Baldivis.

It is anticipated that ATCO Gas will service this development by the internal reticulation of natural gas about the subdivision, utilising a common trench with water reticulation being provided by the developer connecting to the existing gas mains adjacent to the site.

3.11 Developer Contribution Arrangements

The large majority of the LSP area is under single ownership, with this owner taking responsibility for pre-funding and construction of the necessary infrastructure upgrades. Contribution arrangements with other landowners / developers will be via private arrangement and will not require any Development Contribution Plan to be implemented via the planning system.

Contributions towards community infrastructure will be in accordance with the existing Development Contribution Plan No.2.