



Department of Planning,
Lands and Heritage



Western
Australian
Planning
Commission

South Metropolitan Peel Sub-regional Planning Framework

March 2018

The Department of Planning, Lands and Heritage acknowledges the traditional owners and custodians of this land. We pay our respect to Elders past and present, their descendants who are with us today, and those who will follow in their footsteps.

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website: www.dplh.wa.gov.au
email: info@dplh.wa.gov.au

tel: 08 6551 8002
fax: 08 6551 9001
National Relay Service: 13 36 77

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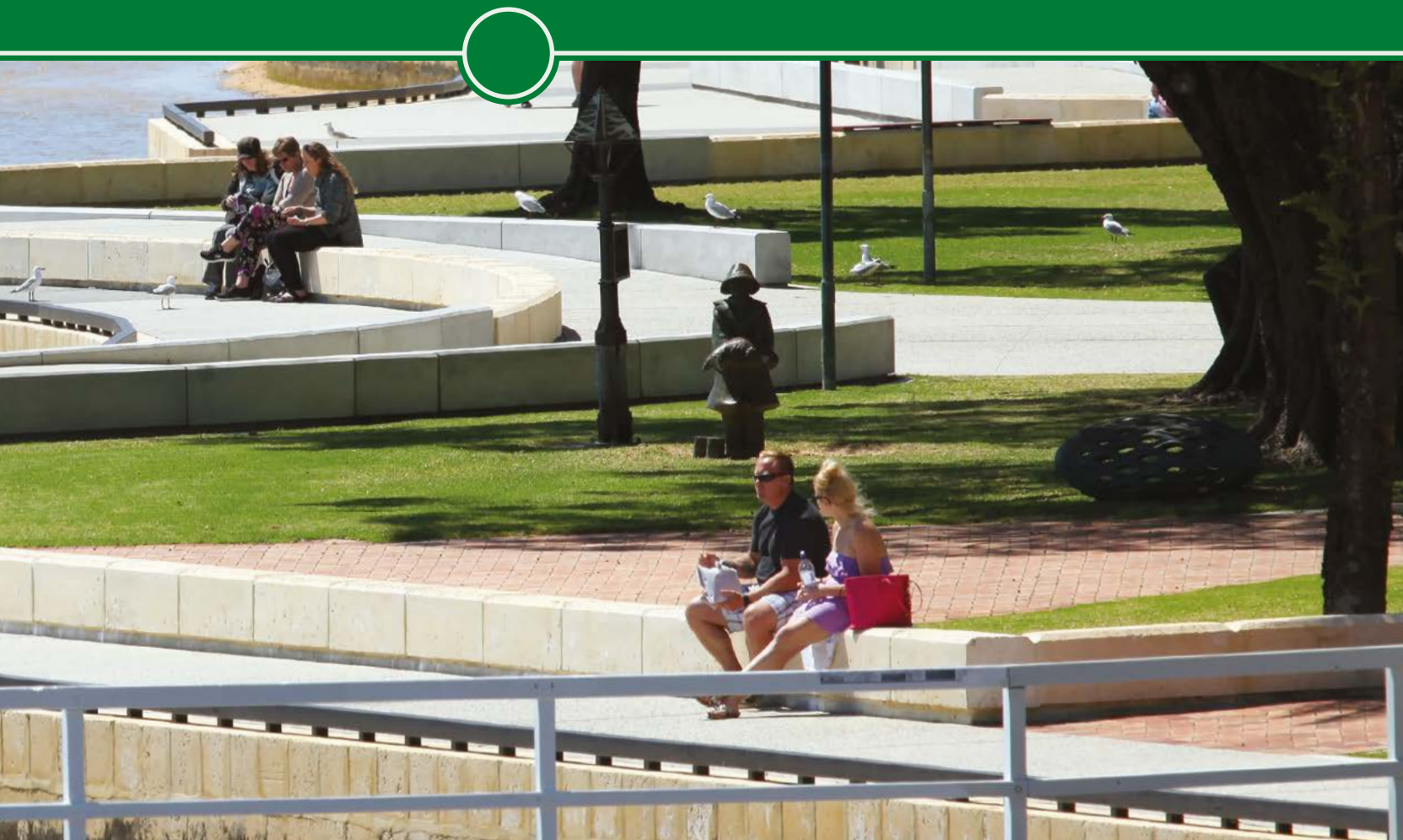
South Metropolitan Peel Sub-regional Planning Framework

March 2018



Perth and
Peel@3.5million

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South Metropolitan Peel Sub-regional Planning Framework

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Foreword by the Minister



Hon Rita Saffioti, MLA
Minister for Transport;
Planning; Lands

I am pleased to release the final *Perth and Peel@3.5million* suite of land use planning and infrastructure frameworks. The Central, North-West, North-East and South Metropolitan Peel frameworks guide the future growth of the Perth and Peel regions as a compact, consolidated and connected city that can accommodate a population of 3.5 million by 2050.

These documents seek to enable the creation of liveable and vibrant communities – suburbs, spaces and places where people want to live, work and socialise.

Where you can go to work close to where you live.

Where you can send your children to a school close to home.

Where you can visit a national park and enjoy our native fauna and flora.

Where you can buy groceries at the local shops, kick a footy at an oval or play in the park, a short walk, drive or bus ride from home.

The frameworks propose an urban footprint to ensure the Perth and Peel regions grow into the communities of tomorrow. They aim to strike a balance between the factors that make a community, from identifying enough land for residential, commercial and industrial development to how to best use proposed and existing social, community and physical infrastructure. This has all been achieved while protecting the regions' significant environmental attributes.

While a substantial volume of work underpins these documents, there is a need for further development of transport networks, including METRONET, and an increased focus on infrastructure-led planning. In this respect, these are not static documents; they will grow and evolve, as the State will, to ensure they continue to be relevant and respond to our changing landscape. They will be continually monitored with an initial review to be undertaken after three years.

Some 800,000 new homes are required to accommodate the projected population growth of 3.5 million by 2050 and this will be delivered through a mix of infill and greenfield development with targets of 47 per cent and 53 per cent respectively.

Good design and amenity is of the utmost importance to creating liveable communities. The State Government is taking a leading role through the development of a new suite of policies that will make sure design is at the forefront of all planning decisions.

Over the next four years, my key priority will be the delivery of METRONET, an integrated and coordinated land use and public transport plan that will connect our suburbs, reduce our chronic road congestion and give Perth the rail system it needs for the future. It will ensure land use outcomes are at the forefront of the design of new infrastructure and lay the groundwork for vibrant new communities.

METRONET will also guide the structural evolution of our city, linking diverse urban centres together for the first time and providing opportunities for greater density and infill development through multiple key suburban centres. It provides tangible form to the sub-regional land use planning and infrastructure frameworks as we prepare for the future.

I would like to thank the Western Australian Planning Commission and the Department of Planning, Lands and Heritage for the hard work involved in developing these documents, as well as everyone who contributed. Your participation will ensure that Perth and Peel will offer dynamic, vibrant and liveable communities that we can be proud of.

Message from the Chairman



Eric Lumsden, PSM
Chairman, Western Australian
Planning Commission

Today we live in a city that was largely planned more than 60 years ago.

The once-in-a-generation *Plan for the Metropolitan region Perth and Fremantle* (1955) - the Stephenson-Hepburn Plan - set out to accommodate 1.4 million people by 2005. This landmark plan provided the basis for the city's current spatial form and introduced many of the elements that define living in Perth and Peel including establishing regional national parks and securing river foreshores and coastal zones for the benefit of all Western Australians. It also initiated a 'corridor' approach for strategic land use planning from the 1970s to the turn of the century.

However, an increasing population has required different land use planning responses, reflected in

strategies such as *Metroplan* in 1990 and *Directions 2031 and Beyond* in 2010. Importantly, assumptions that urban development corridors, fragmentation of rural land and impacts on the natural environment could continue in a 'business-as-usual' approach have been challenged. These elements cannot be considered as economically, socially or environmentally responsible.

The Perth and Peel regions are now going through another critical period of transition. This rapid evolution is clearly evident through significant urban renewal across our capital city and development within the Peel region, home to some of Western Australia's fastest-growing communities.

Now a new strategy will provide guidance for future homes and jobs for an estimated 3.5 million people by 2050; the *Perth and Peel@3.5million* sub-regional land use planning and infrastructure frameworks are the next step in the process towards securing future sustainable, compact and connected development of the Perth and Peel regions.

The frameworks offer an integrated land use and movement network; they provide certainty over land provision and classification; they guide the timing and location of the physical and social infrastructure needed to support new communities; they seek to avoid and protect important

environmental assets; and they reaffirm the need to redress the balance between residential infill and greenfield development.

The frameworks are a comprehensive whole-of-government response to accommodate this unprecedented population increase within a consolidated urban form, informed by extensive collaboration with all relevant State Government agencies, local governments and other key stakeholders. In particular, they align with other key initiatives such as the critical METRONET initiative.

The frameworks are a first step in the ongoing process of refining and detailing planning proposals for Perth and Peel. They will be reviewed after three years and ongoing refinement will continue through local planning schemes and strategies, structure planning, subdivision and development.

The challenge now is to implement the frameworks effectively.

While Government, in conjunction with local government, will take the lead, effective implementation can only be achieved through a whole-of-community commitment. This is critical, as plans are only as good as the will to implement their vision on behalf of communities, now and into the future.

INTRODUCTION

The South Metropolitan Peel Sub-regional Planning Framework aims to **establish** a long-term, **integrated** planning framework for **land use and infrastructure** to guide future growth across the sub-region



1.1 Framework for a city of 3.5 million people

Western Australia's Perth and Peel regions boast an abundance of physical attributes and offer numerous economic and social opportunities that have combined to provide an enviable lifestyle and quality of life that is recognised internationally. Central to this success has been careful planning that has provided housing and employment opportunities and the protection of environmental attributes. Perth and Peel are expected to experience considerable population growth with a population of 2.9 million expected by 2031 and 3.5 million expected by 2050.

To accommodate the projected population growth and to protect lifestyle values into the future, new approaches to planning and development will be required, focussed on creating a connected city, which is liveable, prosperous and collaborative, linking metropolitan hubs with priority transport proposals.

The *South Metropolitan Peel Sub-regional Planning Framework* (the framework) is one of three frameworks prepared for the outer sub-regions of Perth and Peel; North-West, North-East and South Metropolitan Peel (includes the Metropolitan South-West,

Metropolitan South-East and Peel sectors). Combined with the *Central Sub-regional Planning Framework*, these establish a long-term and integrated framework for land use and infrastructure provision.

The frameworks build upon the principles of *Directions 2031 and Beyond: Metropolitan Planning Beyond the Horizon* and are key instruments for achieving a more consolidated urban form that will reduce dependence on new urban greenfield developments to accommodate the anticipated population growth by increasing residential density and urban



infill development targets. The frameworks take account of economic modelling and subsequent refinements following community consultation based on the overall growth scenario for a city of 3.5 million.

The frameworks provide guidance for:

- the preparation of amendments to the Perth metropolitan and Peel region schemes, local planning strategies/schemes, district and local structure plans, and activity centre plans; and
- the staging and sequencing of urban development to inform public investment in regional community, social and service infrastructure.

1.2 South Metropolitan Peel Sub-regional Planning Framework

The South Metropolitan Peel sub-region (Figure 1) covers an area of almost 5,000 square kilometres and comprises the cities of Armadale, Cockburn, Gosnells, Kwinana, Mandurah and Rockingham, as well as the shires of Murray, Serpentine–Jarrahdale and Waroona.

The framework sets out proposals to:

- achieve a more consolidated urban form and development within the sub-region;
- meet long-term housing requirements;
- strengthen key activity centres and employment nodes to meet the future needs of industry, commerce and the community;
- identify requirements for key community and social infrastructure such as those required for health and tertiary education;
- provide transport linkages that connect people with key centres of activity and employment, and access to areas beyond the Perth and Peel regions;
- facilitate and support a future regional transportation network and facilitate the provision of service infrastructure;
- identify sites to meet the growing requirements for regional sport and recreation facilities;
- recognise that the Peel-Harvey catchment requires sensitive land use planning and that management of drainage and environmental issues is paramount;
- protect areas with regional conservation, environmental and landscape value;
- establish the elements and functions of the green network in supporting an active and healthy community;
- encourage and guide increased connectivity between areas of open space or conservation through an integrated green network;
- protect areas with basic raw materials for timely extraction;
- provide ongoing consideration of water supply and protection of public drinking water source areas;
- retain land for rural and agricultural purposes; and
- guide the staging and sequencing of future urban development.

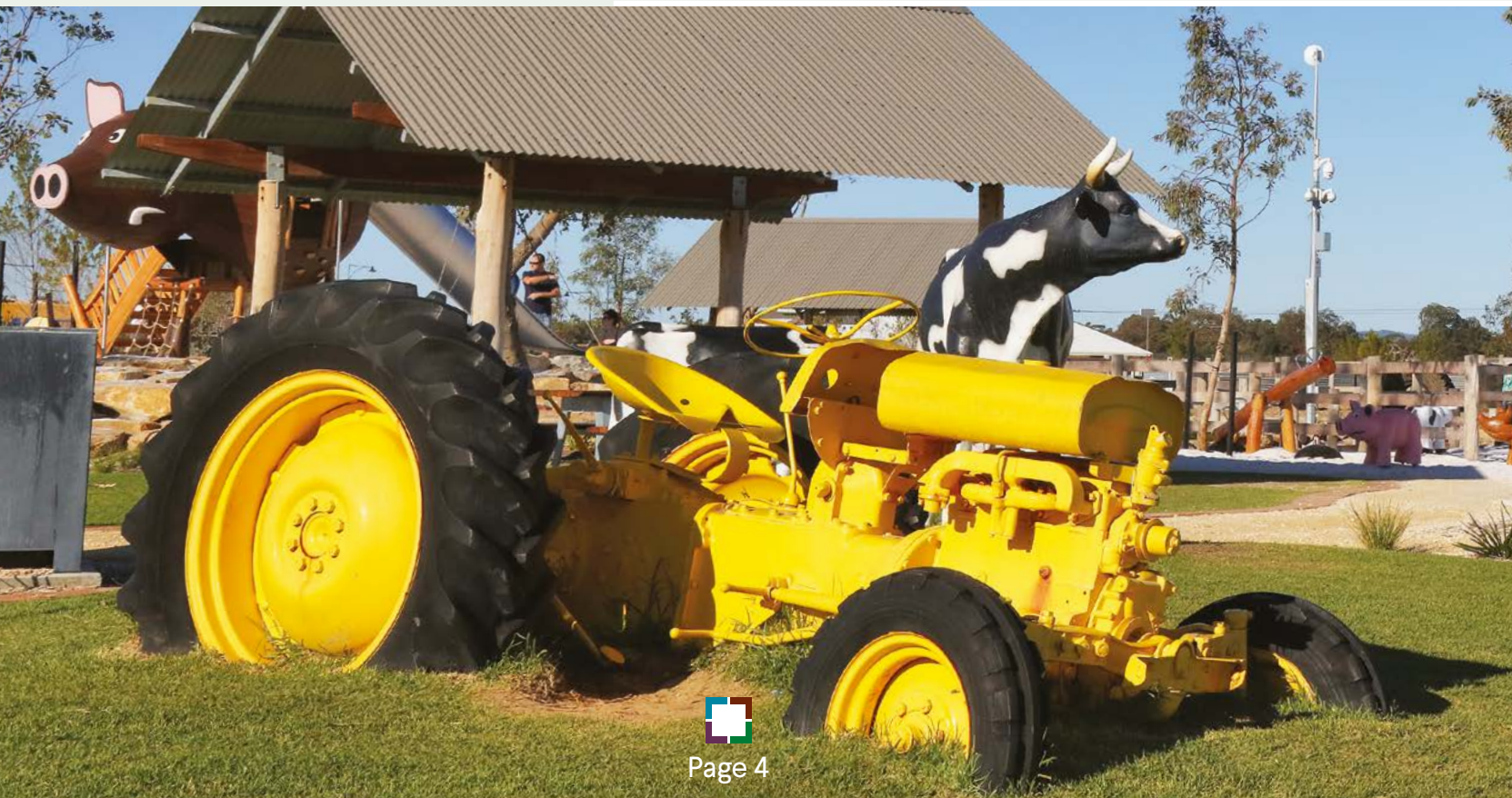


FIGURE 1: South Metropolitan Peel Sub-region



PLANNING CONTEXT

The framework provides strategic guidance to government agencies and local governments on all aspects of land use and infrastructure provision in the South Metropolitan Peel sub-region



2.1 Western Australian Planning Framework

The sub-regional planning frameworks will be recognised within the Western Australian planning framework (Figure 2) under *State Planning Policy 1 State Planning Framework* and taken into account when strategies, policies and plans that apply to the sub-region are prepared or reviewed.

The framework provides strategic guidance to government agencies and local governments on land use, land supply, land development, environmental protection, infrastructure investment and the delivery of physical and community/social infrastructure for each sub-region.

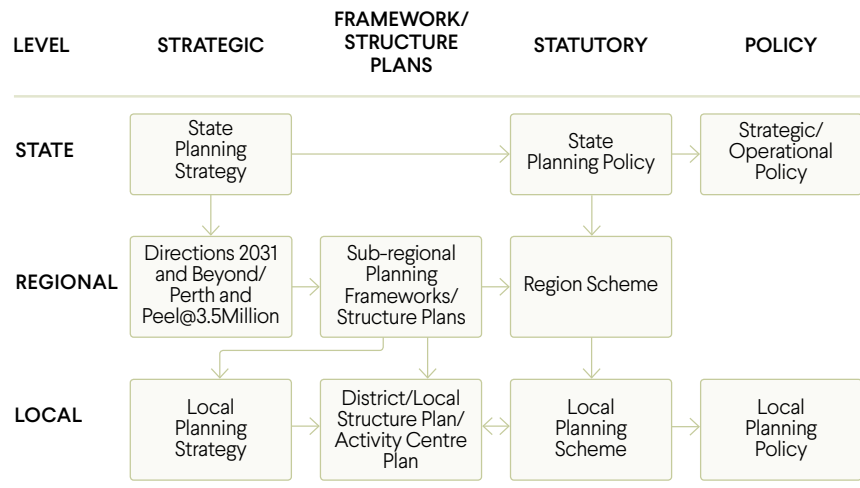
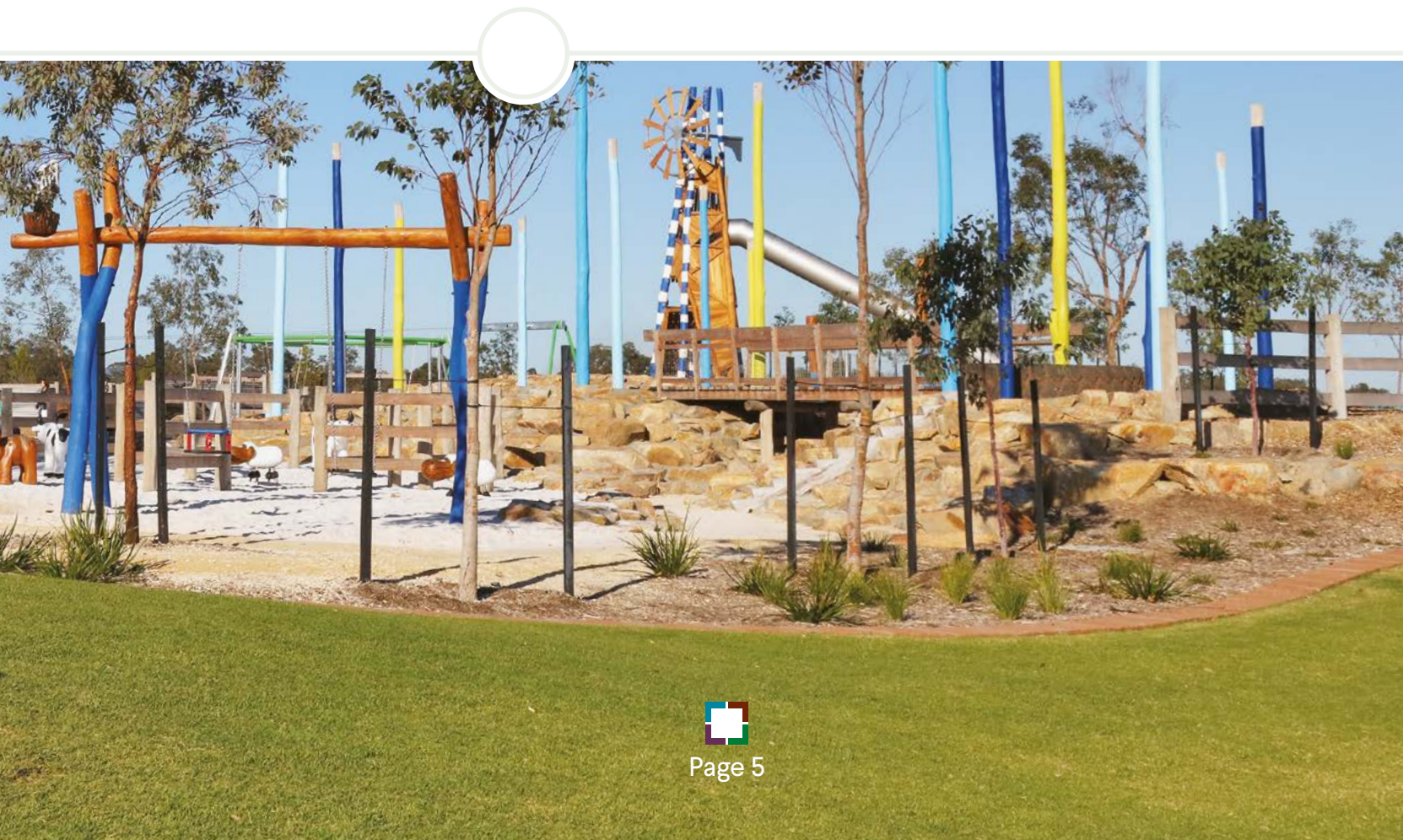


FIGURE 2: Western Australian Planning Framework



2.2 State Planning Strategy 2050

The *State Planning Strategy 2050* is the lead strategic integrated land use planning document for Western Australia, providing the strategic context and basis for the coordination and integration of land use planning and development across State, regional and local jurisdictions. It contemplates a future in which high standards of living, improved public health and an excellent quality of life are enjoyed by present and future generations of Western Australians. The strategy proposes that diversity, liveability, connectedness and collaboration must be central to achieving the vision of sustained growth and prosperity, and establishes principles, strategic goals and directions to ensure the development of the State progresses towards this vision. Population projections in the document indicate that Western Australia's current population could double to 5.4 million by 2056 and the Perth metropolitan region could be home to around 4 million people based on a high-growth scenario.

2.3 Directions 2031 and Beyond

Released in 2010, *Directions 2031 and Beyond* is a high-level strategic plan for the Perth and Peel regions that establishes a vision for future growth — creating a world-class city that is green, vibrant, more compact and accessible and with a unique sense of place.

Directions 2031 and Beyond highlights the benefits of a more consolidated city that accommodates future population growth while aiming to protect the environment and achieve a more sustainable pattern of urban development and effective transportation networks. It also:

- sets a target for a 50 per cent increase from the then current average residential density of 10 dwellings per gross urban zoned hectare in new residential areas, to 15 dwellings per gross urban zoned hectare; and
- sets a target for a 50 per cent increase from the then current 30–35 per cent level of urban infill development, to 47 per cent, within the Perth and Peel regions.

Additionally, the plan seeks to address the relationship between where people live and where they work with the aim of reducing commuting time and cost through the delivery of improved employment self-sufficiency across the outer sub-regions.

The key principles of *Directions 2031 and Beyond* formed the basis for the development of the *Perth and Peel@3.5million* spatial plan (the spatial plan).

In the event of any inconsistency between *Directions 2031 and Beyond* and the frameworks, the frameworks prevail.

2.4 Region planning schemes

The *Metropolitan Region Scheme* (MRS) and the *Peel Region Scheme* (PRS) are the regional planning schemes for the Perth and Peel regions and are the principal statutory mechanisms for the implementation of strategic land use and infrastructure proposals (Figure 3). These schemes provide for the acquisition of land (and waterways) where reserved for public purposes including regional open space, public uses and infrastructure.

Local government planning, including local planning schemes and policies are required to be consistent with the broad land uses assigned under these region schemes.



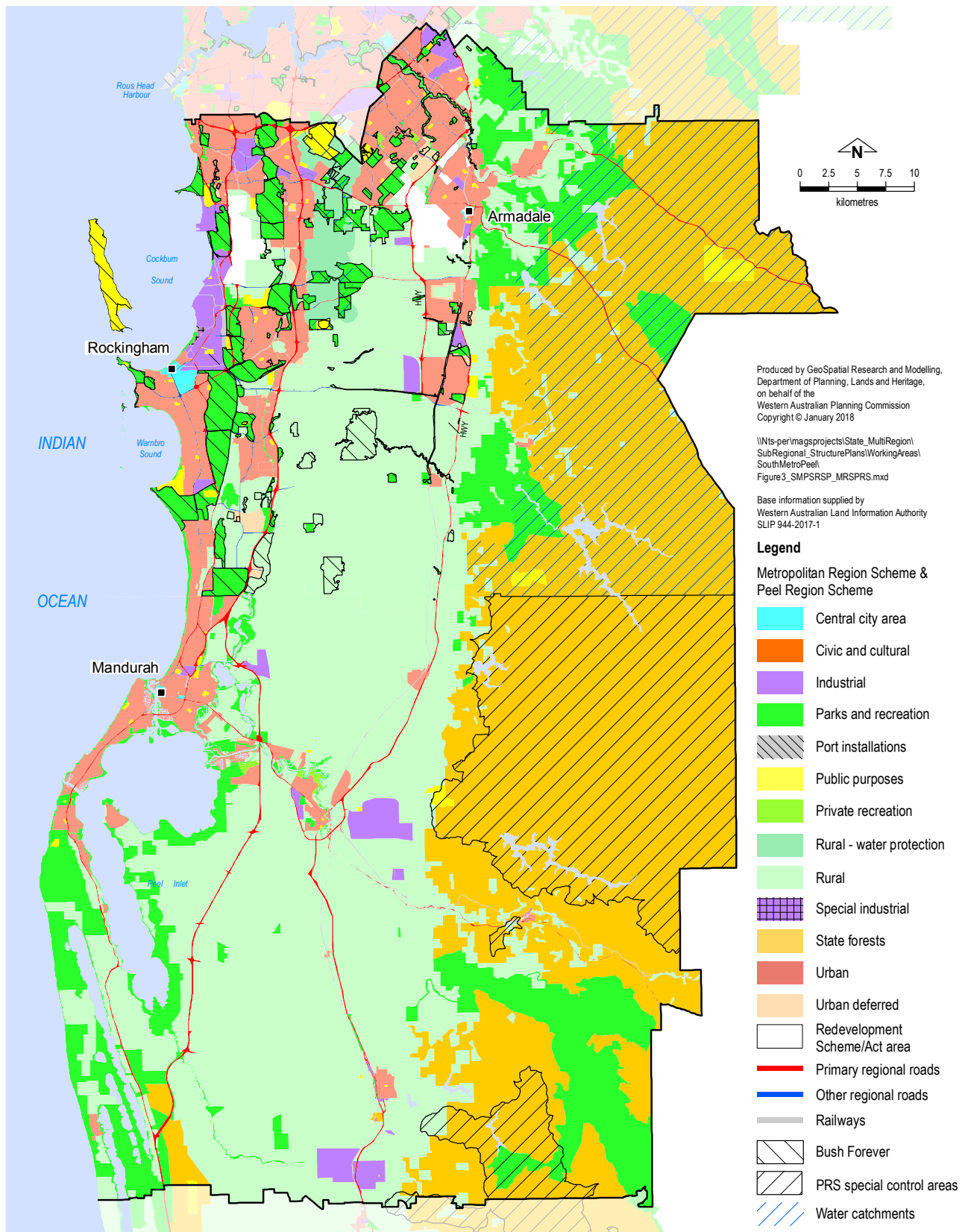


FIGURE 3: Metropolitan and Peel Region Schemes

2.5 Hope Valley–Wattleup planning legislation

The *Hope Valley–Wattleup Redevelopment Act 2000* was enacted primarily to provide for the development and redevelopment of approximately 1,400 hectares of land located adjacent to the coast between Fremantle and Rockingham for mixed industrial uses. The project is commonly known as Latitude 32.

The MRS and local planning schemes do not apply to the redevelopment area. Development and redevelopment of land within this area are required to be in accordance with the master plan that provides a framework for future development in a manner similar to a local government planning scheme.

LandCorp is responsible for progressing strategic planning within the area, including implementation of the master plan and preparation of structure plans and associated documents to guide and facilitate subdivision and development. The Western Australian Planning Commission (WAPC) is a regulator within the area, assessing and determining LandCorp's proposals. Ultimately, once structure planning has been completed, the area will be normalised and planning powers, in accordance with the established planning framework, will be reinstated.

2.6 Metropolitan Redevelopment Authority — Armadale

Under the provisions of the *Metropolitan Redevelopment Authority Act 2011*, the Metropolitan Redevelopment Authority (MRA) is responsible for implementing the Armadale Redevelopment Scheme. Within the MRA area, the MRS and the City of Armadale local planning scheme do not apply and the MRA has planning responsibility to ensure that development is consistent with its redevelopment objectives and vision of creating a thriving strategic centre with a strong focus on sustainability.



2.7 Preceding sub-regional structure plans and strategies

High-level strategic documents that previously guided the planning of the sub-region include the *South-West Corridor Structure Plan* (1993), *South-East Corridor Structure Plan* (1996), *Inner Peel Region Structure Plan* (1997), *Coastal and Lakelands Planning Strategy* (1999), draft *Outer Metropolitan Perth and Peel Sub-regional Strategy* (2010) and *Economic and Employment Lands Strategy: Non-heavy Industrial* (2012).

Land use and infrastructure proposals and planning principles within these documents have been refined and, where necessary to account for the current planning context, reviewed within the framework which will now guide land use planning strategies and policy development in the sub-region.

2.8 Aboriginal heritage and native title

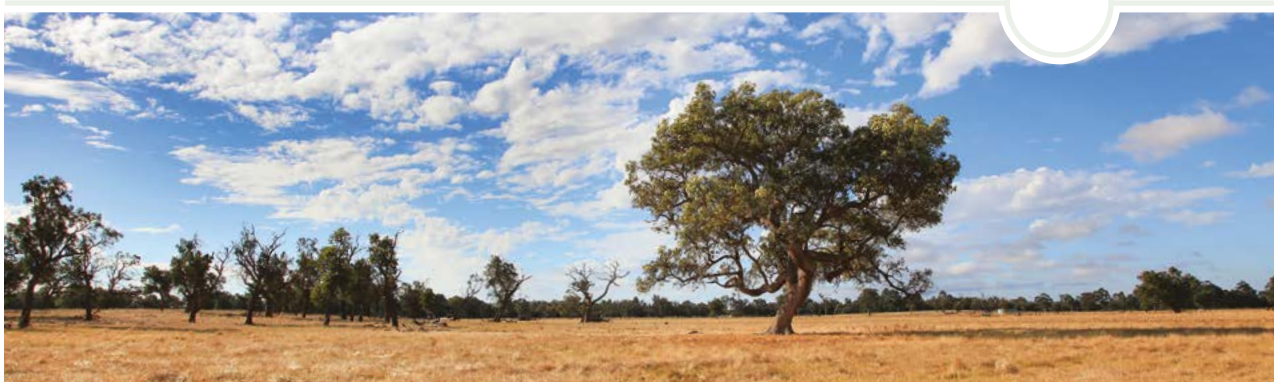
The frameworks acknowledge the traditional owners of the land, past and present. The recognised traditional owners for the Perth and Peel regions are the Whadjuk and Gnaala Karla Booja people – see the Noongar (Koorah, Nitja, Boordahwan) (Past, Present, Future) *Recognition Act 2016*. Broadly, the Whadjuk regions includes the coastal areas from Two Rocks south to Garden Island including Perth, Fremantle and Rottnest Island and extending inland including the area of Jarrahdale, Mundaring and Toodyay. The Gnaala Karla Booja region includes the coastal areas from Kwinana to Capel, including Mandurah and Bunbury and also includes inland areas extending beyond the Perth and Peel regions to just north of Kojonup and just south of Corrigin.

The State Government and South West Aboriginal Land and Sea Council have negotiated the South West Native Title Settlement.

Under the Settlement, native title is proposed to be exchanged for a negotiated package of benefits, including formal recognition of the Noongar people as traditional owners, land, investments and the establishment of Noongar Regional Corporations.

The South West Native Title Settlement is not yet finalised. Until the Settlement is finalised, the *Native Title Act 1993* (Commonwealth) continues to apply in the Settlement Area. Within the Settlement Area, the *Aboriginal Heritage Act 1972* (WA) applies at all times and will continue to do so after the commencement of the Settlement.

Land users must always consider Aboriginal heritage in their planning processes. The Department of Planning, Lands and Heritage is able to provide advice in relation to the application of the Aboriginal Heritage Act in the sub-regions.



2.9

The spatial plan for *Perth and Peel@3.5million*

The spatial plan for the Perth and Peel regions has been developed with the aim of delivering a more consolidated urban form and achieving a more efficient and cost-effective urban structure that minimises environmental impacts (Figure 4).

This plan has been prepared in collaboration with the Strategic Assessment of the Perth and Peel Regions (SAPPR), which is a holistic response to environmental approval requirements under Commonwealth and State government legislation.

The spatial plan has been prepared through an all-of-government approach, taking account of social, economic and environmental considerations including:

- the relationships between future urban land and existing development and infrastructure;
- existing planning commitments such as previously-approved sub-regional and district structure plans;
- fundamental geographic and related considerations that confine most urban development to the coastal plain;
- bushfire risk;
- containment of urban development to minimise further sprawl;
- an assessment of the capacity of existing urban land to meet future requirements for housing and population growth and the amount of additional urban land required;
- a systematic analysis of urban values by rating the potential of all land in the Perth and Peel regions to contribute to, and capitalise on, an efficient urban form;
- a detailed examination of significant environmental values, as set out under State and Commonwealth environmental legislation and policies, especially the Peel-Harvey catchment;
- a review of land requirements for economic and employment opportunities;
- an examination of the capacity of regional infrastructure to add value to existing infrastructure while minimising future costs to service future growth;
- the expectation that servicing agencies will work collaboratively to maximise future shared infrastructure corridors and sites;
- investigations of cost considerations in relation to urban form; and
- investigations into the demand and supply of basic raw materials.

The spatial plan identifies the need to:

- recognise existing regional open space areas and identify those that will be required in the future;
- avoid development within regionally-significant vegetation areas, wetlands and other high value environmental areas, including attributes within the Peel-Harvey catchment;
- protect regionally-significant landscape values;
- safeguard high-priority groundwater resources;
- ensure the appropriate use of scarce basic raw materials;
- retain options for long-term infrastructure corridors and installations;
- avoid land use conflicts by taking into account buffer requirements such as those required for industry, airports and wastewater treatment plants; and
- exclude development from floodways and other low-lying areas.



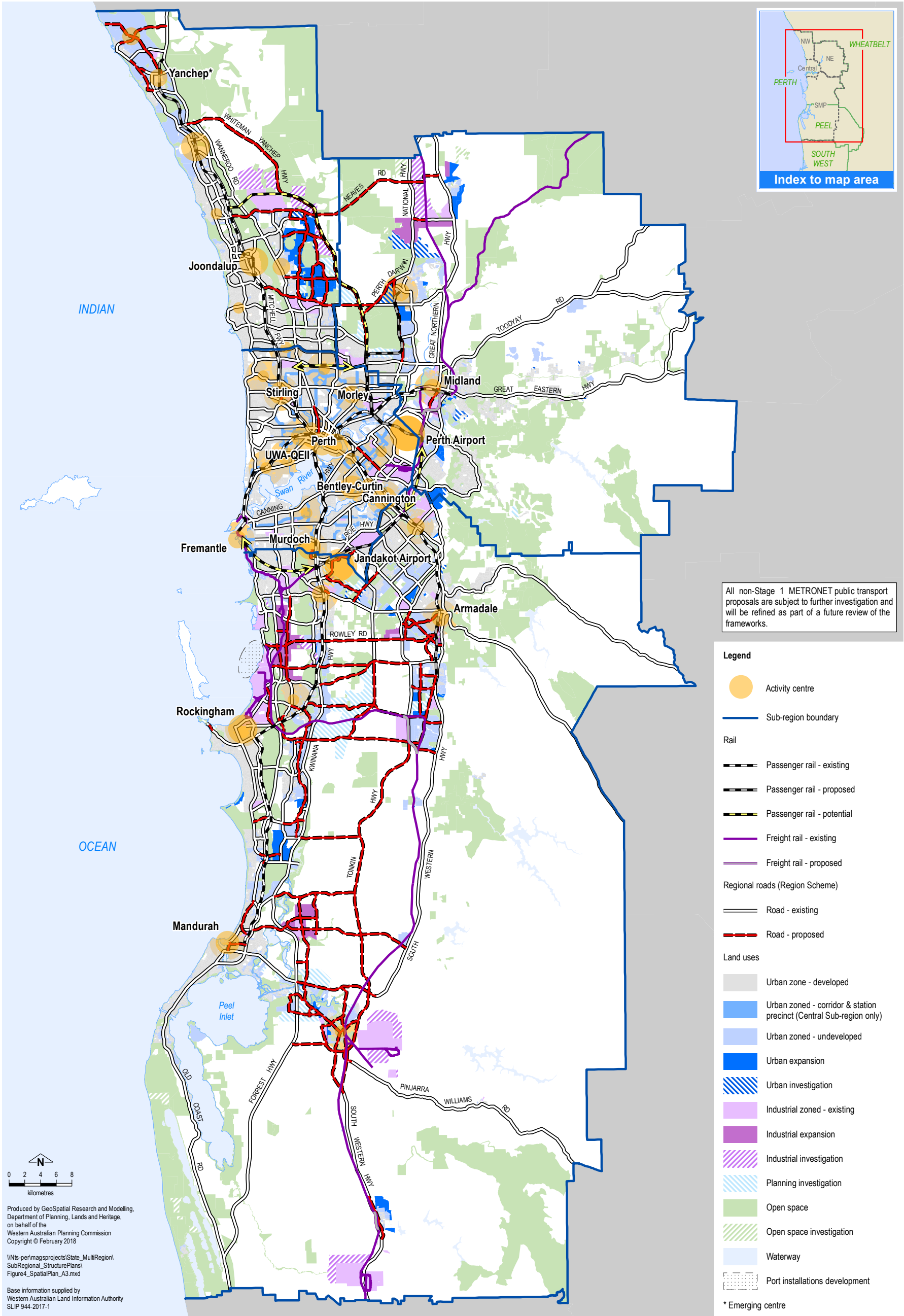


FIGURE 4: Perth and Peel@3.5million – spatial plan

2.10 Other regional initiatives

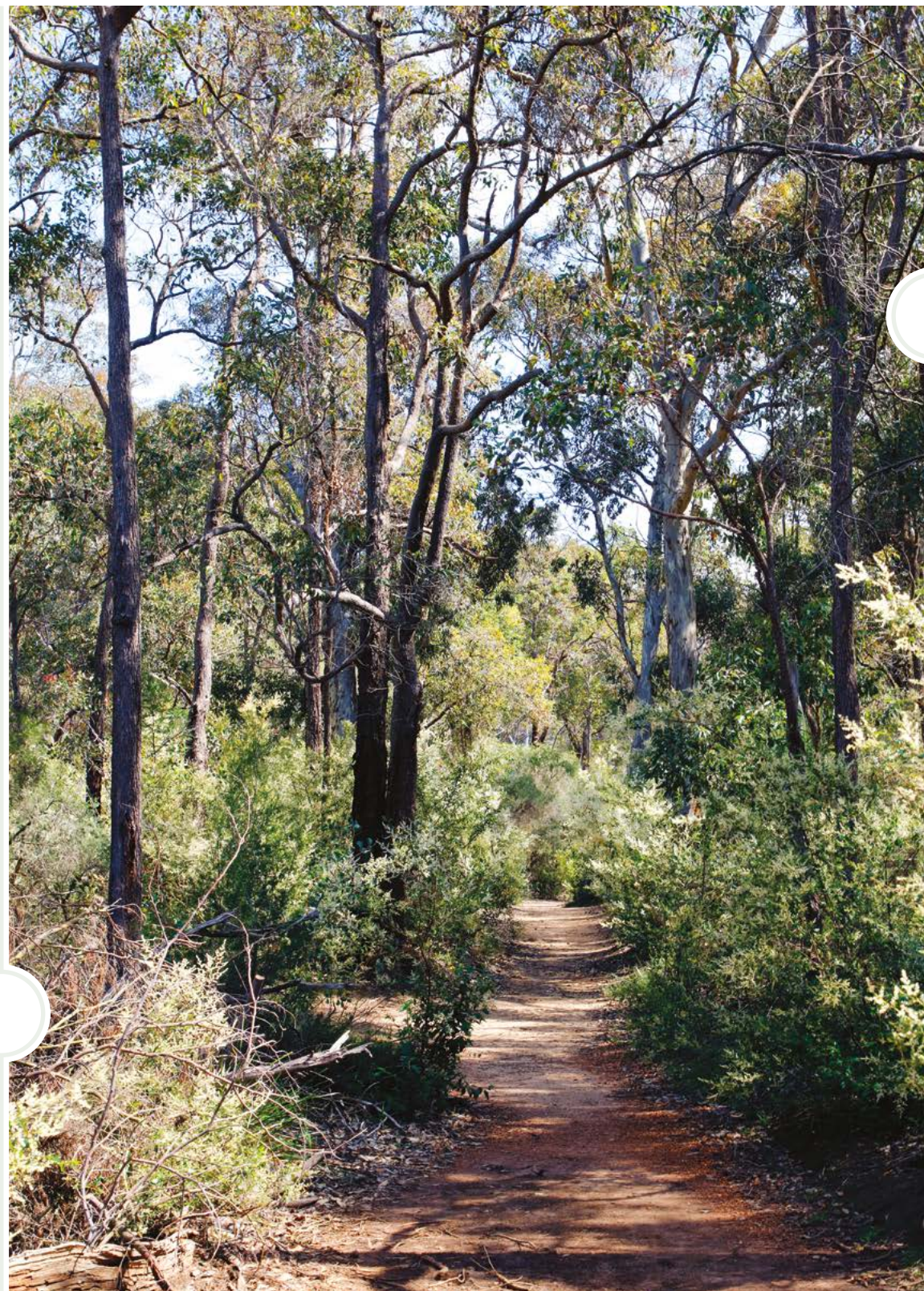
At the time the spatial plan was prepared, more than 16,000 hectares of remnant native vegetation was identified and excluded from future urban, industrial and rural residential development sites, and sites for the extraction of basic raw materials. This involved the exclusion of some sites previously identified as having development potential in preceding sub-regional plans, structure plans and/or local planning strategies.

Sites identified for development within the spatial plan may still contain environmental attributes that need to be identified, avoided and protected at subsequent stages of planning through a variety of mechanisms.

The implementation of the frameworks in accordance with the requisite environmental approvals will enable the Perth and Peel regions to accommodate a population of 3.5 million while meeting the requirements of relevant environmental legislation.

The framework has been developed in collaboration with other State Government agencies and takes into consideration and reflects, where appropriate, a number of important ongoing initiatives such as:

- long-term transport planning for Perth and Peel to provide a network of strategic road and public transport linkages (including METRONET) to support a city of 3.5 million and beyond;
- planning for the development and growth of both the Inner Harbour at Fremantle and the future Outer Harbour at Kwinana by the Westport Taskforce;
- *Future Perth Airports Technical Study* (Department of Planning, Lands and Heritage, in conjunction with the Transport portfolio), which investigates potential sites for a new aviation facility to serve the Perth and Peel regions;
- review of *State Planning Policy 2.4 Basic Raw Materials* (Department of Planning, Lands and Heritage), which includes a review of basic raw materials resource mapping;
- the identification of high quality, priority agricultural land and primary production precincts across Perth and Peel by the Department of Primary Industries and Regional Development;
- *Perth and Peel Regions Water Supply Strategy* (Department of Water and Environmental Regulation) which will identify demand gaps, viable alternative supply options, and provide direction for future sub-regional planning;
- review of *State Planning Policy 2.1 Peel-Harvey Coastal Plain Catchment*;
- the *Future State Administered Roads Project* (Mains Roads Western Australia), which is a review of future State road classifications; and
- planning future land use options for East Keralup.



SUB-REGIONAL PLANNING FRAMEWORK

The framework aims to ensure that a comprehensive approach is taken to planning for residential development, local employment, infrastructure provision and protecting natural resources and environmental attributes



Introduction

This framework provides high-level strategic guidance for the future development of the Metropolitan South-West, Metropolitan South-East and Peel sectors to accommodate part of the long-term growth of the Perth and Peel regions to approximately 3.5 million people by 2050.

The framework aims to ensure that a comprehensive approach to planning is undertaken by:

- providing opportunities for residential development and local employment;
- facilitating good accessibility for all modes of transport;
- ensuring the conservation of regionally-significant environmental attributes,

especially the Peel-Harvey catchment; and

- protecting natural resources.

The framework has been developed to provide general guidance and inform future amendments to the MRS and PRS and to provide a framework for further investigations and detailed planning. The framework is divided into the following three sections;

- objectives;
- strategic direction and priorities; and
- appendices that provide further technical detail supporting the framework.

The framework provides guidance in relation to anticipated timeframes and sequencing for the delivery of urban development sites as well as the identification of industrial sites and key infrastructure, while recognising that the delivery of these sites will depend on a number of factors including demand for land, progress of more detailed planning and provision of infrastructure. The timeframes referenced in the framework are outlined in Table 1.

TABLE 1: Planning framework timeframes

Timing	Timeframe
Short-term	up to 2021
Medium-term	2022 to 2031
Long-term	post 2031



3.1

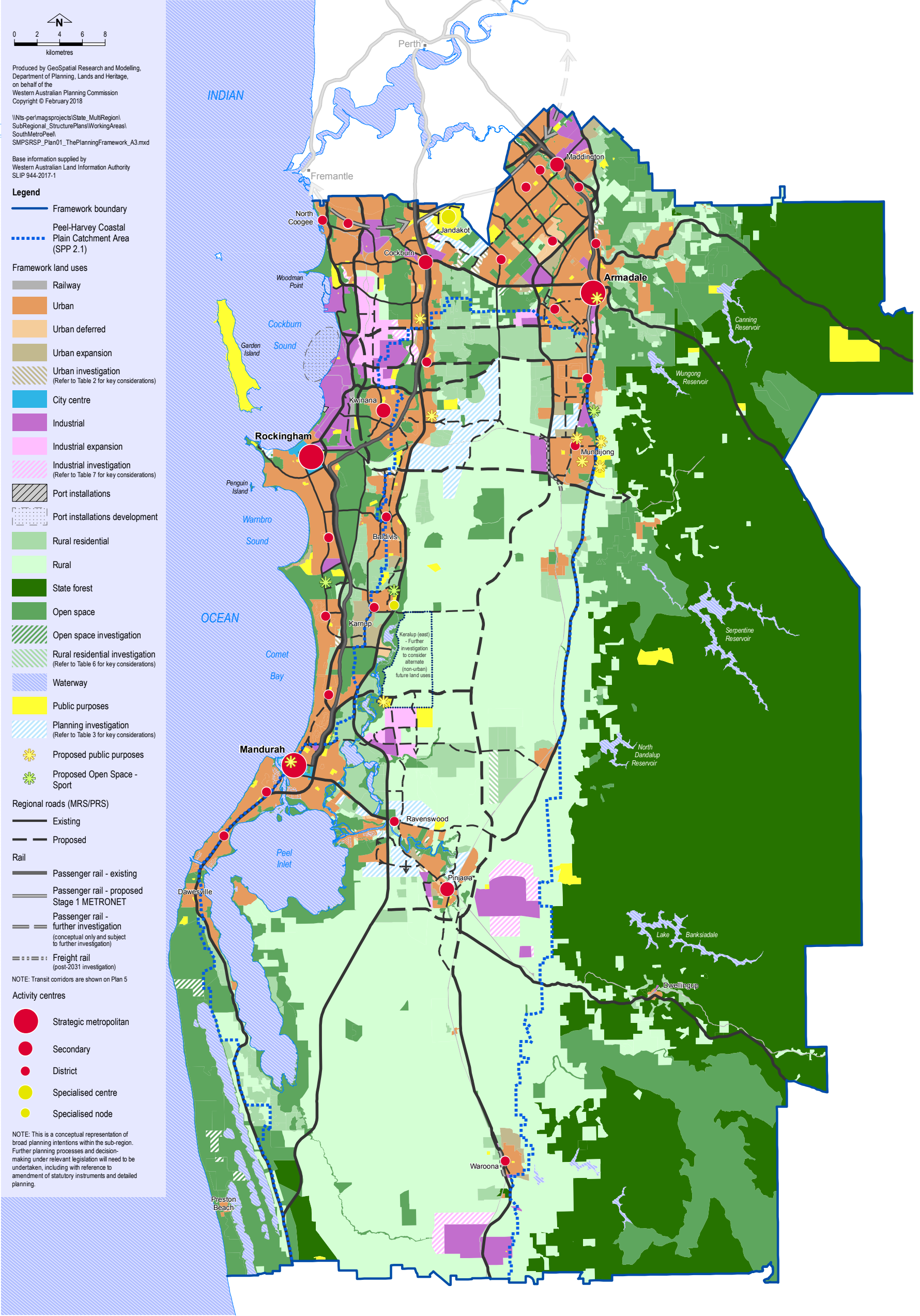
Key planning framework principles

There is a wealth of environmental attributes within the sub-region, including the coastline, the Ramsar-listed Peel-Yalgorup wetland system, several national and regional parks and significant bushland and wetlands that provide habitats for flora and fauna. The protection of these attributes from the potential impacts of population growth will require careful consideration and planning at each stage of the planning process.

The following key principles have been fundamental to the development of the framework culminating in a multi-faceted planning response to avoid, protect and mitigate the sub-region's environmental attributes that are protected under Commonwealth and State environmental legislation:

- Develop a consolidated urban form that limits the identification of new greenfield areas to where they provide a logical extension to the urban form, and that places a greater emphasis on urban infill and increased residential density.
- Avoid areas that are at a high risk of bushfire to manage the potential impact on people, property and infrastructure.
- Limited support for new rural residential development, with the emphasis on areas currently zoned for the purpose.
- Facilitate increasing the number of people living close to where they work with the identification of suitable sites for employment within the sub-region, with a focus on attracting strategic economic and employment land use to the sub-region.
- Protect employment land from other competing land uses that could limit its ability to be used for employment purposes.
- Integrate land use and public transport to contribute to maintaining air quality.
- Maximise the use of and add value to existing infrastructure, including transport, community/social and service infrastructure, where there is a concentration of urban and employment opportunities.
- Promote shared infrastructure corridors and sites for transport, community/social and service infrastructure (where appropriate).
- Provide effective and sustainable management of water resources including public drinking water source areas, drainage, nutrient management and water allocation to minimise environmental impacts, particularly in a drying climate.
- Avoid, protect and mitigate impacts on environmental attributes (with an emphasis on avoiding and protecting) when allocating proposed land uses, or address impacts through an improved conservation estate where those impacts cannot be avoided or mitigated, especially the Peel-Harvey Catchment area.
- Identify ultimate land uses for industrial and public purposes sites, while promoting access to finite basic raw materials, through the staging and sequencing of development.
- Retain land for agriculture and food production.

The key land use proposals for the sub-region are shown in Plan 1.



PLAN 1: The planning framework

3.2 Consolidated urban form

Objective

To create sustainable communities that are attractive places to live and work. The consolidation of urban areas will provide for more efficient use of urban land and infrastructure with improved access to public transport, sport and recreation, community and commercial facilities, while minimising impacts on significant environmental attributes.

Strategic direction and priorities

The sub-region is expected to experience relatively strong population growth through to 2050, influenced by, among other things, the provision of relatively affordable housing as well as employment and lifestyle opportunities. The sub-regional population is predicted to grow considerably – from 523,430 up to 1,264,450 people by 2050.

The consolidated urban form identified in the framework has been developed within the context of the overall spatial plan for the Perth and Peel regions. The spatial plan is designed to accommodate a population of 3.5 million people in a more consolidated urban form that focuses on the use of existing infrastructure and minimises environmental impacts.

The framework builds upon key principles and structural elements of *Directions 2031 and Beyond*, specifically increased urban infill development, higher densities in undeveloped areas already zoned for urban use and limited additional greenfield development – the aim of which is accommodate sustainable future growth.

A significant amount of future development will occur on land already zoned for urban purposes. This includes the continuing development between Kwinana–Rockingham and Mandurah–Pinjarra, as well as within emerging urban areas throughout the sub-region including Byford and Mundijong. Consistent with the planning principle established in 1999's *Coastal and Lakelands Planning Strategy*, urban development will not extend south of a line from Dawesville–Pinjarra.

To provide the capacity to accommodate the predicted population growth, vacant and under-utilised urban land that can be serviced with the required infrastructure and that is located in proximity to activity centres, transit corridors or areas of high amenity should be identified as a priority for increased density. Planning instruments guiding the development of new urban areas are to use a minimum average

residential density target of 15 dwellings per gross hectare of Urban zoned land.

It is critical that planning for the predicted population growth focuses on making the most efficient use of transport networks, service infrastructure, employment and key community/social infrastructure facilities.

A foundation of the proposed consolidated urban form is to concentrate the majority of the population within reasonable proximity of key public transport networks, as well as a wide range of services and activities, with



high-quality built form, public spaces and green networks. There are large amounts of existing zoned land available and some new greenfield areas are also proposed to accommodate consolidated population growth. These areas are well located and will deliver sustainable communities that are well integrated with the existing urban form.

Strategic metropolitan centres provide regional-level services and facilities, service population catchments of up to 300,000

people, and are the key element of the network of activity centres. Focusing on opportunities that build on existing and proposed infrastructure within these centres can provide a catalyst for a mix of land uses, employment opportunities and housing choice and diversity. Within the sub-region, access to the Armadale, Rockingham and Mandurah strategic metropolitan centres, as well as to activity centres at Fremantle and Cannington (Central sub-region), will be important.

The framework seeks to optimise the use of land close to existing transport infrastructure and key centres of activity and community amenity. To achieve this, a focus for both infill and new urban areas will be the development and evolution of new and existing activity centres into vibrant, mixed-use community hubs that are integrated with high-quality public transport connections.



A large area of the sub-region lies within the Peel–Harvey estuary catchment. Where new urban development is proposed within the catchment of the Peel–Harvey waterways, drainage management programs utilising best practice to minimise nutrient export and ensure the maintenance and sustainability of ecosystems will be required, as will the protection and/or enhancement of existing vegetation and wetlands.

A limited number of proposed new urban areas have been classified for potential expansion or investigation. Areas of existing and proposed special residential development have also been included within the Urban and Urban Expansion areas, respectively, in the framework to reflect the residential nature of this form of development. However, the classification of these special residential areas as Urban/

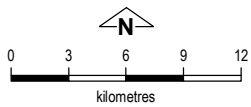
Urban Expansion should not be construed as support for the further development of these areas at a higher density.

The proposed consolidated urban form largely avoids and minimises impacts on significant environmental values. Even so, some land classified as Urban/ Urban Deferred, Urban Expansion/ Investigation or Planning Investigation may contain significant environmental attributes and these classifications should not be construed as support for the development of such land. More detailed planning for these sites will need to prioritise avoidance and/ or protection of these attributes. Expanding the tree canopy in developed areas and improving outcomes in new greenfield areas will also contribute to reducing the urban heat island effect and improving urban amenity.

Based on existing development trends, there is sufficient capacity in the proposed consolidated urban form, including potentially some of the identified Planning Investigation areas to meet the anticipated demand for additional dwellings beyond 2050. The proposed consolidated urban form for the sub-region is shown in Plan 2.

The framework also classifies some limited areas of land in Jandakot/ Treeby, Langford, Cardup, Mangles Bay, and in the east of Kwinana and Pinjarra–Ravenswood sectors for further Planning Investigation. The WAPC's position is that further investigations, regarding a range of key planning considerations, are required to determine whether any possible change from the lands current zoning could be supported in these sectors.





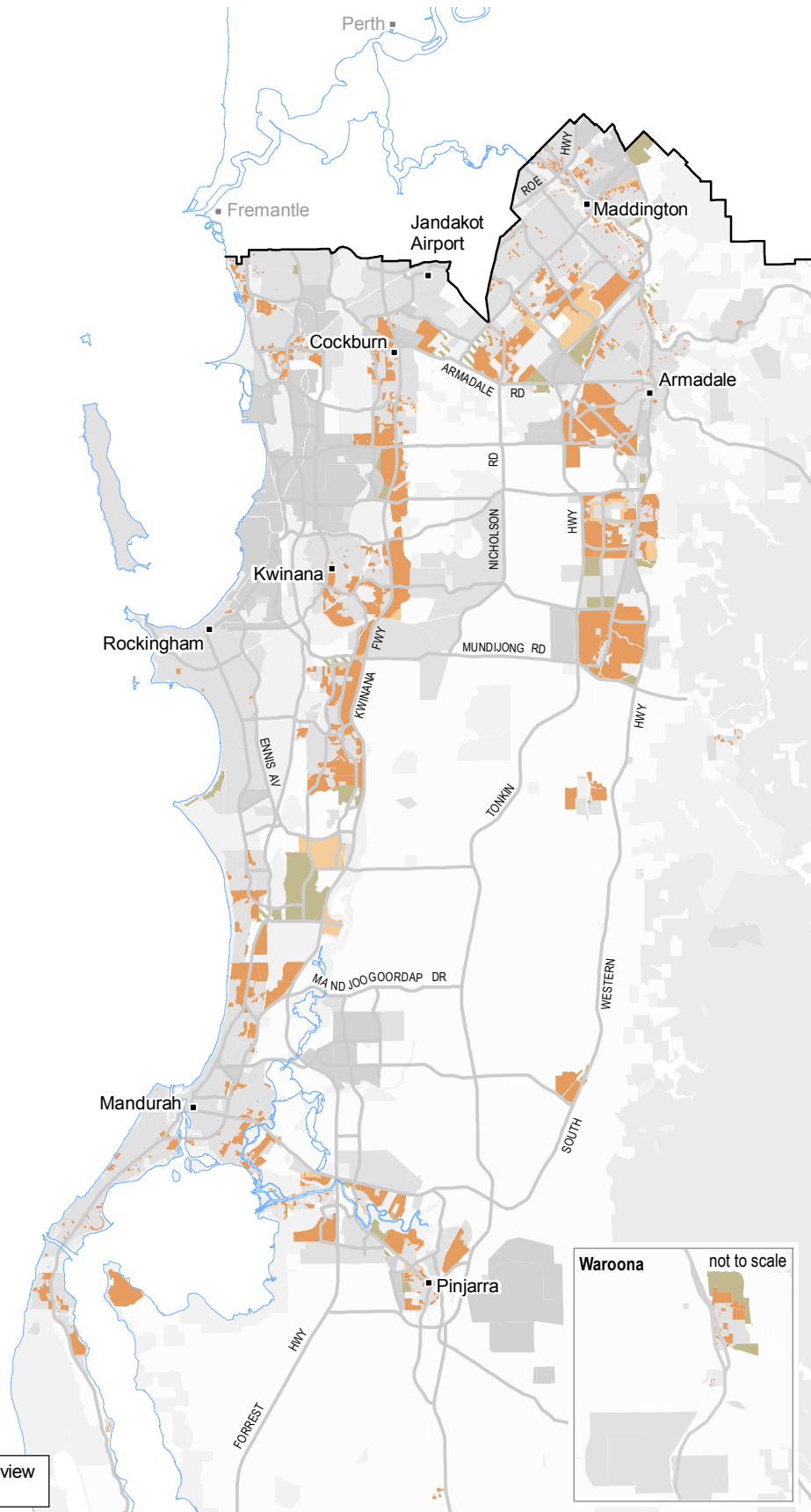
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Legend

- Urban undeveloped (MRS/PRS)
- Urban deferred undeveloped (MRS/PRS)
- Urban expansion
- Urban investigation



Proposals are subject to further review
of Planning Investigation areas

PLAN 2: Consolidated urban form



Urban Expansion/ Investigation

A number of Urban Expansion and Urban Investigation areas have been classified in the sub-region. These areas are strategically located, least constrained by environmental and physical considerations and have comparative proximity to the coast and strategic metropolitan centres, particularly Rockingham and Mandurah.

A key area of future urban development will be located at Baldivis–Karnup. Future clusters of development may also be identified at Golden Bay, east of Kwinana and/or at Pinjarra–Ravenswood as part of further planning investigations. These could form part of the future urban structure extending generally between Rockingham–Kwinana and Mandurah–Pinjarra.

Other Urban Expansion/ Investigation areas will consolidate and ‘round off’ existing urban areas. These areas include land identified at Hamilton Hill, Cockburn Central (east), Banjup, Piara Waters, Orange Grove, (West) Martin, Kelmscott, Champion Lakes, Forrestdale, Darling Downs, Byford (south), Cardup, Mundijong and Mandogalup.

Further detailed planning is required before future urban development can occur in these areas including, but not limited to, investigations into significant environmental attributes, servicing, community and social infrastructure, movement networks and employment. Minor refinement of expansion or investigation area

boundaries may be required to accommodate more detailed future planning.

Urban Investigation areas will also require further detailed planning to be undertaken prior to consideration of any rezoning under the MRS or PRS. The classification of these areas is not to be construed

as a commitment by the WAPC to support any rezoning as this will depend upon the outcome of further detailed planning investigations. The specific matters that need to be addressed for these areas include, but are not limited to, those in Table 2.

TABLE 2: Urban Investigation areas – key considerations

Site	Key considerations
Orange Grove (also see Wattle Grove in North East sub-region)	Geotechnical analysis/land suitability to provide connections to reticulated waste water services. Bushfire risk. Protection of significant environmental attributes.
Kelmscott	Bushfire risk.
Forrestdale (townsite east)	Determine exact extent of the water resource precinct buffer. Determine specific employment generating land uses (e.g. bulky goods/light industry in nature) that are compatible with the water resource precinct buffer. Refine the specific area to be used for employment generating uses.
Piara Waters	Impacts, risks and management of Jandakot groundwater resources (existing Priority 2 Source Protection Area).
Banjup (east)	Impacts, risks and management of Jandakot groundwater resources (existing Priority 2 Source Protection Area).
Baldivis – Kerosene Lane	Basic Raw Materials – sequential land use allowing for extraction of limestone. Provide land for employment generating land uses (e.g. bulky goods/light industry in nature). Protection of high value Carnaby’s black cockatoo habitat.
Golden Bay	Access to the regional road network (Mandurah Road) and to Karnup Train Station. Dune protection. Integration with Karnup Train Station. Bushfire risk.
Lots 1, 2, 102, 250 and Pt Lot 602, Pinjarra	Confirm suitability for urban land uses in conjunction with review of Planning Investigation areas.

Planning Investigation

Limited areas of land in Jandakot/ Treeby, Langford, Cardup, Mangles Bay, and in the east of Kwinana and Pinjarra-Ravenswood sectors have been classified for further planning investigation as part of the strategic reconsideration of land use in the sub-region.

These investigations will determine whether any possible change from the lands current zoning is possible and/or appropriate. These investigations are required to be undertaken prior to any related MRS amendment processes.

The Planning Investigation classification should not be construed as WAPC support for a change from the existing land use/ zoning, as this will depend upon the outcome of further investigations. The specific matters that are intended to be investigated for these areas include, but are not limited to, those in Table 3.

TABLE 3: Planning Investigation areas – key considerations

Site	Key considerations
East of Kwinana and Pinjarra-Ravenswood sectors	<p>Employment – access to employment opportunities (and identification of land for employment generating activities).</p> <p>Passenger rail – access to, timing of and implications for passenger rail services and travel times.</p> <p>Road networks – function, capacity and/or cost of existing and proposed networks.</p> <p>Environmental considerations – implications of/for significant on-ground environmental attributes and Peel-Harvey catchment considerations.</p> <p>Sand fill – including volume, source and comparison of one-off and recurring transport requirements.</p> <p>Inundation/flood management – implications of the need to manage water.</p> <p>Basic raw materials – implications of on-site resources.</p> <p>Dwellings/population – consider overall capacity in the context of accommodating 3.5 million people in Perth and Peel.</p> <p>Critical mass/urban form – any need to achieve a critical mass/ threshold of population (e.g. for the provision of key facilities, services and/or employment opportunities) and the ability to create an integrated and efficient urban form.</p> <p>Mosquitoes – nuisance and health considerations.</p> <p>Social and community infrastructure – implications for existing and/or possible requirements for additional key social and community infrastructure.</p> <p>Movement and access – relationship with, and identification of, road and public transport networks.</p> <p>Environment and landscape – identify any requirements for additional open space (nature/passive recreation).</p> <p>Service Infrastructure – any implications of/for key service infrastructure networks, including drainage networks.</p> <p>Staging – any implications of, or solutions provided by, staging.</p> <p>Future planning options – consider any need to retain post-2050 planning options.</p> <p>Built form – consider alternate built form opportunities to minimise fill requirements.</p>
Jandakot/ Treeby	<p>Impacts, risks and management of Jandakot groundwater resources (existing Priority 2 Source Protection Area).</p> <p>Protection of significant environmental values.</p> <p>ANEF considerations associated with Jandakot Airport.</p>



TABLE 3: Planning Investigation areas – key considerations (continued)

Site	Key considerations
Langford	Land use transition/interface with regional open space and coordination/integration with adjoining Urban areas. Regional recreation needs analysis.
Cardup	Servicing of the site. Integration with METRONET network.
Mangles Bay	Currently under consideration through MRS Amendment 1280/41.

Note: Detailed planning considerations may include additional matters and/or matters not identified at this time.

Urban infill

Infill development within established urban areas has the potential to contribute to housing diversity and respond to ongoing changing demographics and community aspirations. It is expected that infill development will also contribute to maximising the use of existing infrastructure and economies of scale for provision of transport and service infrastructure. This will assist in delivering innovative housing typologies and provide opportunities for more affordable living within vibrant and revitalised neighbourhoods characterised by mixed-land uses, reduced car dependency, more efficient public transport and increased opportunities for social interaction.

Table 4 sets out the minimum infill dwelling targets to 2050 that have been established to guide local governments in the preparation of more detailed planning, including local planning strategies and structure plans.

Local governments shall have regard to the principles for urban consolidation in Table 5 when identifying locations for future infill development. These principles include a focus on infill within areas with proximity to transit corridors and stations, within activity centres and urban corridors, and areas with high-quality open space. This will often align with planning for

the delivery of METRONET and METRONET precincts that match quality infill with amenity by creating a mix of open space, housing, workplaces and entertainment venues.

The aim is for these locations to accommodate the majority of the infill dwellings required for the sub-region by 2050, while the remaining infill dwellings may occur within suburban areas outside of the identified locations.

The *Central Sub-regional Planning Framework* identifies the specific location of future urban corridors. However, these are yet to be extended into, or identified for, the outer sub-regions. Local governments in the outer sub-regions will need to consider the logical continuation of these urban corridors when preparing local planning strategies and schemes.

TABLE 4: Urban infill dwelling targets by local government

Local government	Dwelling target	Estimated population
Armadale	15,020	33,040
Gosnells	12,800	28,160
Serpentine–Jarrahdale	1,370	3,010
Cockburn	14,680	32,300
Kwinana	1,370	3,010
Rockingham	14,680	32,300
Mandurah	14,510	31,920
Murray	1,080	2,380
Total	75,510	166,120



TABLE 5: 10 principles for urban consolidation

Principle	Description
1. Housing	Provide well-designed higher-density housing that considers local context, siting, form, amenity and the natural environment, with diverse dwelling types to meet the needs of the changing demographics.
2. Character and heritage	Ensure the attractive character and heritage values within suburbs are retained and minimise changes to the existing urban fabric, where appropriate.
3. Activity centres	Support urban and economic development of the activity centres network as places that attract people to live and work by optimising land use and transport linkages between centres; protecting identified employment land from residential encroachment, where appropriate, and avoiding contiguous linear or ribbon development of commercial activities beyond activity centres.
4. Urban corridors	The focus for higher-density residential development. Where appropriate, located along transit corridors and promoted as attractive places to live by optimising their proximity to public transport while ensuring minimal impact on the surrounding urban fabric and the operational efficiency of the regional transport network.
5. Station precincts	Where appropriate, focus development in and around station precincts (train stations or major bus interchanges as set out under the METRONET initiative) and promote these precincts as attractive places to live and work by optimising their proximity to public transport while ensuring minimal impact on the operational efficiency of the regional transport network.
6. Industrial centres	Promote the current and proposed supply and/or development of industrial centres as key employment nodes and prevent incompatible residential encroachment on these areas.
7. Public transport	Ensure that most transit corridors are supported by quality higher-density residential land uses and identify where new or improved public transport services will be needed to meet long-term growth, especially current and future train station precincts.
8. Infrastructure	Ensure more efficient use of and add value to existing and planned infrastructure to achieve a more sustainable urban environment. Protect existing and proposed infrastructure from incompatible urban encroachment to promote a system where land use developments and infrastructure are mutually compatible.
9. Green network	Preserve, enhance and consolidate the green network of parks, rivers, recreation areas, facilities for active open space, conservation and biodiversity areas, and areas with a high level of tree canopy coverage, considered important for the health and wellbeing of the community.
10. Protection	Avoid, protect and mitigate environmental attributes and promote development that contributes to maintaining air quality and minimises risks of inundation from sea-level rise, flooding or storm surge events and that minimises the risks of bushfire damage.

Heritage

The sub-region contains heritage places and landscapes that need to be preserved for future generations. These contribute to providing a sense of place. Opportunities exist within urban consolidation areas to add new development in under-utilised spaces that can benefit from existing heritage value and character.

The framework acknowledges there are benefits and opportunities that come with the adaptive reuse of heritage places, including sustainability benefits through retention of existing buildings and reduced demolition waste. A number of design incentives and bonuses are also available to encourage the revitalization of heritage places. Adaptive reuse, where it can be achieved while respecting the heritage values of a place, is actively supported by the Heritage Council of Western Australia. The proposed consolidated urban form also minimises encroachment into rural places that also represent an important component of the sub-region's heritage.

Rural residential

Rural residential areas provide alternative lifestyle and housing opportunities and may also provide a transition between urban and rural areas. However, rural residential development is a relatively inefficient form of development, places additional demand on community and service infrastructure that is difficult to meet and can prejudice other future planning options.

State Planning Policy 2.5: Rural Planning states that within the Perth and Peel regions opportunities for rural living, including rural residential development, will become more limited with rural living proposals being considered by exception. Areas reviewed and classified for rural residential development in the framework include existing rural residential zones, areas identified within endorsed or draft strategies

or other planning documents, and some areas of rounding-off of existing areas. On this basis, the creation of new rural residential lots/ areas beyond those classified within the framework is unlikely to be supported by the WAPC.

Rural residential land is characterised by lot sizes that are predominantly between one and four hectares. Areas where permitted lots sizes are predominantly larger than four hectares are considered to have a 'small holdings' character and are classified Rural, even if some lots smaller than four hectares in size are permitted. This does not exclude the creation of some lots that are less than four hectares in size in these areas, provided that this is already provided for in an existing scheme or strategy, prior to finalisation of the framework (e.g. Herron-Lake Clifton).



Approximately 1,000 hectares of land previously identified for rural residential development has not been included in the framework. The exclusion of these areas was the result of a number of considerations including, but not limited to, potential impacts from nutrient export on the Peel–Harvey estuarine system, impacts on environmental values and the lack of demonstrated need for the significant areas of additional rural residential development proposed.

Notwithstanding this, approximately 23,000 hectares of land remains available for rural residential use (existing and future) within the

sub-region. This land provides for a range of rural residential lifestyle opportunities.

Some limited Rural Residential Investigation areas require further detailed planning to be undertaken prior to consideration for rezoning under the MRS or PRS. The classification of these areas should not be construed as the WAPC's support for rezoning as this will depend upon the outcome of further detailed planning. The specific matters that need to be addressed for these areas include, but are not limited to, those in Table 6.

TABLE 6: Rural Residential Investigation areas – key considerations

Site	Key considerations
Lot A38, A29 and 803, North Dandalup	Confirmation of the impact of risk mitigation measures required for the Dampier-Bunbury Natural Gas Pipeline on minimum lot sizes.

Note: Detailed planning considerations may include additional matters and/or matters not identified at this time.

Bushfire management

In Western Australia bushfire is a natural part of the ecosystem, however with a drying climate, the intensity of bushfires and associated risk to life and property has increased particularly for urban and rural residential development.

The need to appropriately plan land use and development within areas adjacent to bushfire risks has become increasingly prominent over recent years. The effects upon individuals and the community of bushfires can be devastating and as such close attention must be paid to the application of measures that prevent or mitigate bushfire risks. Accordingly, further development or intensification of land uses where there is a lack of sufficient certainty that bushfire risks can be satisfactorily mitigated will not be supported.

Any proposal for urban development will need to ensure that it has considered and where applicable, applied *State Planning Policy 3.7 Planning in Bushfire Prone Areas*. This policy includes reference to designated bushfire-prone areas, to assist in reducing the risk to people, property and infrastructure by encouraging a risk-based approach to strategic planning, subdivision, development and other planning decisions proposed in bushfire-prone areas. Further investigations are currently being undertaken to review the bushfire planning framework.



3.3 Economy and employment

Objective

To promote employment opportunities and increase the number of people who live and work within the sub-region, with a focus on attracting strategic economic and employment land uses within the strategic metropolitan centres and key industrial centres, while maximising use of existing and proposed infrastructure.

Strategic direction and priorities

Population-driven business and employment are significant contributors to total employment within the sub-region. The coastal strip between Fremantle and Kwinana is a focus for strategic industrial land uses due to the availability of major infrastructure including existing and proposed port installations and freight infrastructure within this area.

The sub-region has a considerable reliance on jobs in other locations, especially within the CBD, the Central sub-region and outside of the Perth metropolitan area with fly-

in-fly-out jobs in the north-west of the State. This reliance is particularly evident in the south-eastern sector, which currently has an employment self-sufficiency of 45 per cent (2011), as well as the Peel sector.

The future economy of the sub-region and related employment opportunities are projected to focus on manufacturing, construction, retail, healthcare and social assistance. Substantial employment opportunities are also expected and required in education, training, public administration, safety and tourism. Employment self-sufficiency levels in the South Metropolitan Peel sub-region are projected to increase from 65 per cent to 83 per cent in the south-western sector,



from 45 per cent to 61 per cent in the south-eastern sector and from 72 per cent to 79 per cent in the Peel sector.

In order to deliver jobs within the sub-region, and therefore contribute to the employment self-sufficiency levels in each sector, employment growth needs to better match the sub-region's labour force and demographic profile. This would include manufacturing and agricultural sectors as well as knowledge-based employment that should be strategically located at activity and specialised centres.

Additional industrial land, located on key east-west transport routes, will provide a local employment option for people within the south-eastern sector. Also, proximity to priority agricultural land in the sub-region provides an opportunity for the development of related support industries.

This framework identifies locations for the expansion of existing industry and commerce. These locations include the Western Trade Coast (which is Western Australia's premier industrial area), new Outer Harbour and proposed intermodal freight transfer facilities within the Latitude 32 industrial area and Mundijong. Improved linkages between the south-western and south-eastern sectors will improve freight transportation to these strategic sites. These transport networks are outlined in further detail in Section 3.5.

A future industrial area is also located at Nambeelup. This will provide additional land for industrial use and is intended to provide important opportunities for future employment in the Peel region.

An overview of the economy of the Perth and Peel regions, showing key existing and proposed employment centres and economic infrastructure, is shown in Figure 5. The framework also includes a hierarchy of existing and new activity centres and a number of existing and proposed industrial centres that will serve as key locations for employment. Existing and proposed employment centres within the sub-region are shown in Plan 3.

Additional employment centres may be identified as part of the review of Planning Investigation areas.

Collaboration across government and with the private sector is required to facilitate economic development and improved self-sufficiency within the sub-region, particularly to attract strategic economic and employment land uses into the sub-region and maximise the use of existing infrastructure. *Perth and Peel@3.5million* has identified an overarching vision and key objectives for the future growth of the Perth and Peel regions, including its economic development. Local government has an important role in facilitating economic development

within the sub-region through the preparation of local development strategies that:

- encourage and facilitate of growth for activity and industrial centres for the purpose of delivering employment opportunities;
- protect of employment-generating land from the encroachment of competing and/or incompatible land uses;
- create employment opportunities which utilise local labour force skills to increase employment self-sufficiency;
- maximise and encourage further growth of the area's key economic sectors and/or clusters;
- cultivate and strengthen relationships with key stakeholders; and
- provide targeted services and support to businesses to facilitate economic growth.

The framework provides job growth projections for the sub-region to 2050. However, local governments are encouraged to maximise job growth opportunities for employment nodes in the preparation of local economic development strategies that may result in job growth that exceeds these projections, especially in the Mandurah and Pinjarra activity centres.



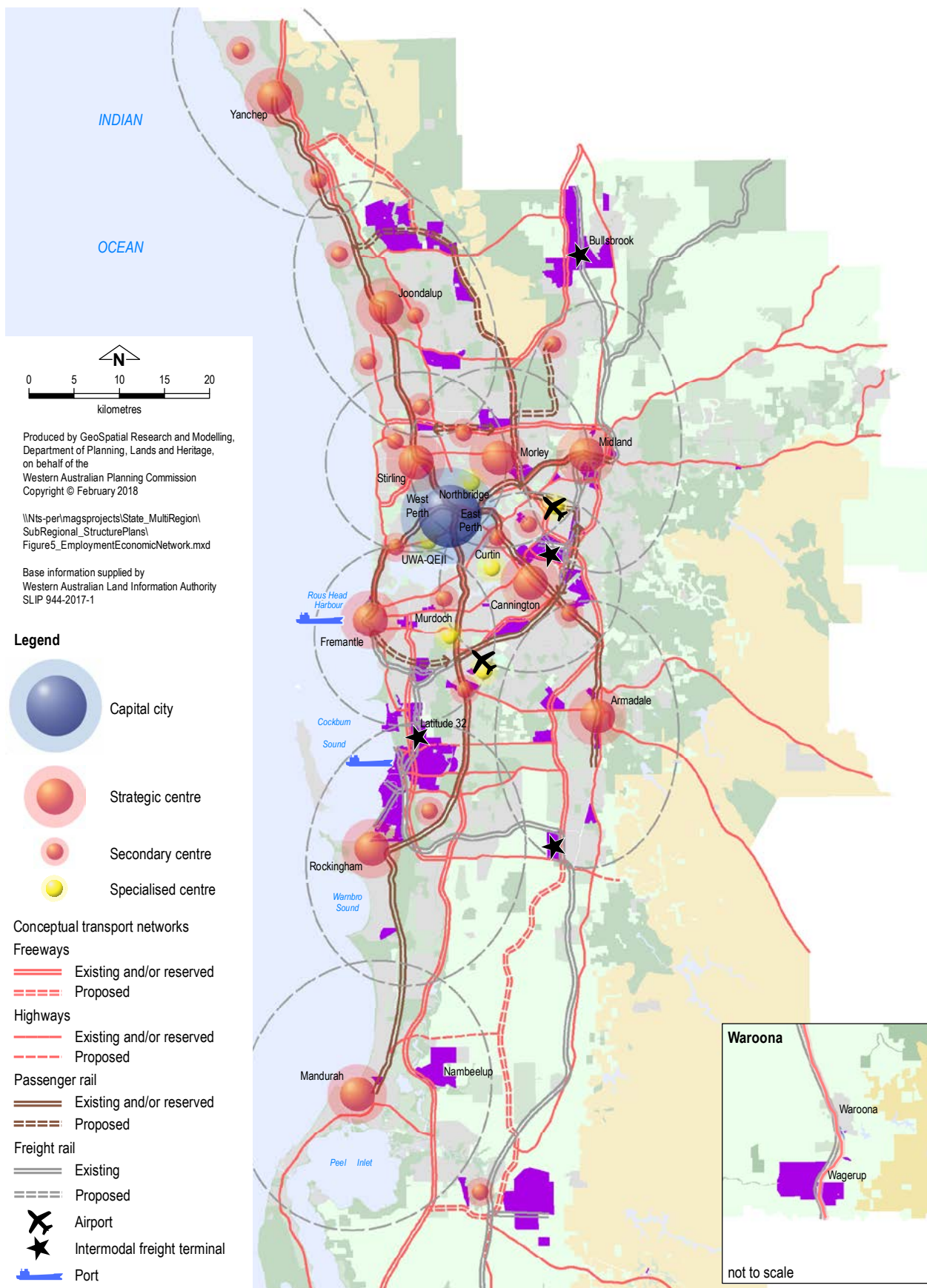
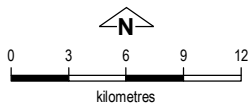


FIGURE 5: Employment and economic network 2050



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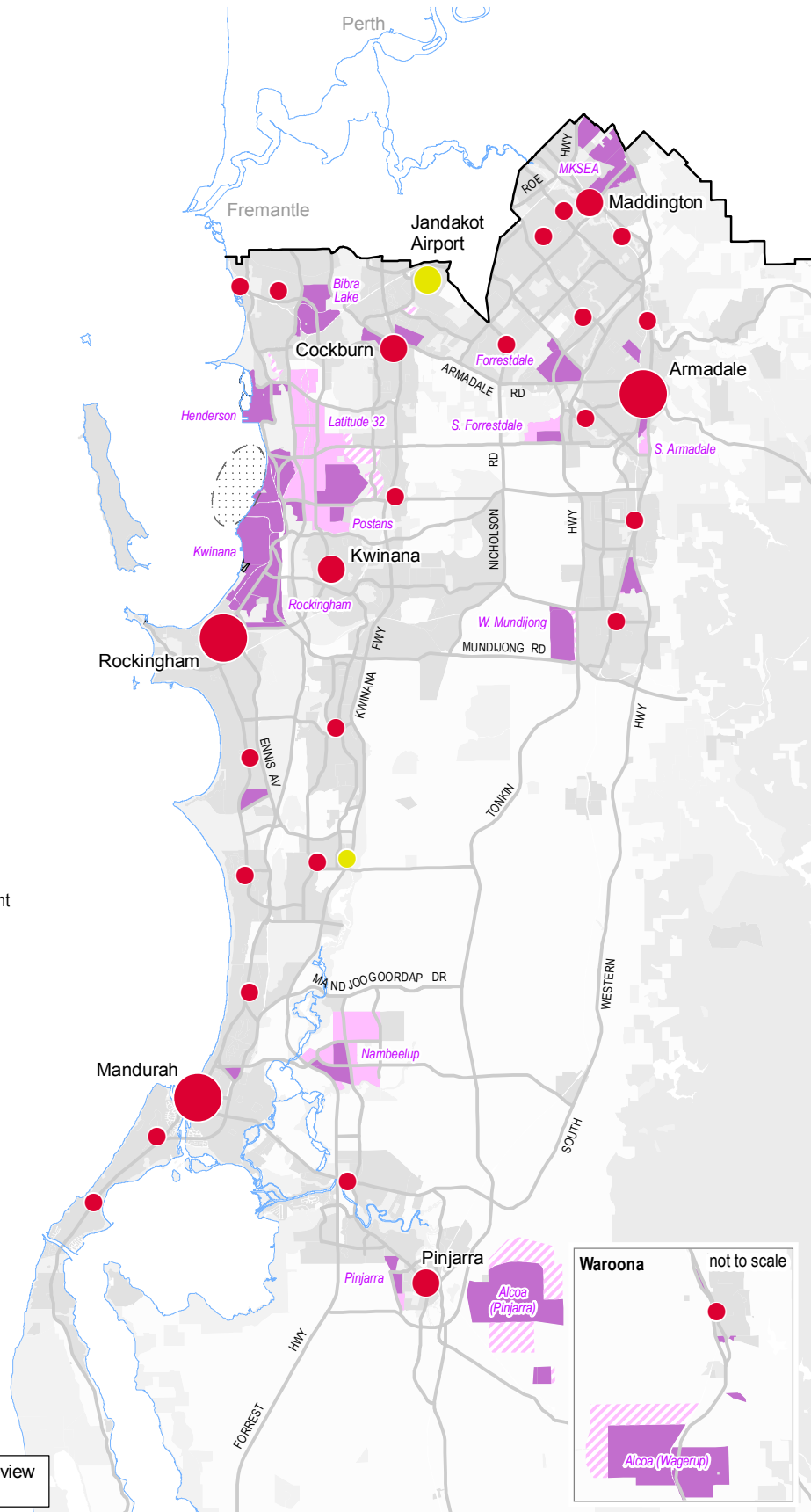
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Legend

Activity centres

- Strategic metropolitan
- Secondary
- District
- Specialised centre
- Specialised node

- Existing industrial
- Industrial expansion
- Industrial investigation
- Port installations
- Port installations development



PLAN 3: Employment opportunities



Activity centres

A network of activity centres will be a key focal point for commercial and social activity and the delivery of services to residents living nearby and will be a major driver of new jobs located within communities. These aim to allow more people to live closer to where they work with the aim of reducing overall commuting distances. Some will build on existing infrastructure such as universities and hospitals to leverage community assets into innovative job creating activity centres.

Strategic metropolitan centre

Population growth will increase the importance of existing strategic metropolitan centres at Armadale, Rockingham and Mandurah.

Armadale

A long-standing key activity centre for surrounding urban areas and considered the south-eastern sector's civic services hub, Armadale has not historically attracted strong non-retail business investment. Additional public transport services will enhance the effectiveness of the centre and support further growth and employment opportunities. Education and training and public administration and safety are growing industries that can be capitalised upon within the Armadale activity centre; however, non-car based access to the centre

will be critical. The prioritisation of passenger rail services between Armadale and Byford, in conjunction with a future transit corridor between growing urban areas in Byford and Mundijong, will further emphasise Armadale's role as the south-eastern sector's key strategic employment centre and assist in the diversification of its employment base.

Rockingham

The principal centre of the south-western sector, Rockingham has a large and increasingly urban catchment. Population-driven growth will support increased retail activity and the activity centre will be the focus of office and commercial development for much of the area. The ability to attract development and investment has been constrained by the need for better connectivity between the heavy rail system and city centre. Transit corridors connecting the city centre with the surrounding urban catchment are proposed.

Mandurah

Mandurah is the focal point for population, commercial and retail activity in the Peel sector. The activity centre is enhanced by the natural attractions of the Mandurah foreshore and waterways. The centre will remain the focal area for retail and commercial development as well as tertiary education in the sector. Continued diversification into tourism industries will provide agglomeration benefits for other employment sectors such as accommodation and food services,

arts and recreation services, tourism, education and service industry.

Access to this location for both tourists and local workers in the region is important. Transit corridors connecting the city centre with the Mandurah station, the surrounding urban catchment and other key centres including Pinjarra and Ravenswood are proposed and essential. Consolidation of non-residential activities in the city centre is necessary to enable more-effective public transport services.



Secondary centre

Existing centres at Maddington, Cockburn, Kwinana and Pinjarra will continue to serve their surrounding catchments.

Maddington

Maddington town centre provides considerable potential for mixed-use, residential and commercial development in response to population growth. This centre is expected to be one of the key catalysts for service-based employment growth in the sub-region. To realise the potential of this centre, a structure plan is being prepared between landowners, the local government and the State Government to facilitate the necessary planning and infrastructure upgrades.

Cockburn

Cockburn Central has the potential to be a key commercial and retail service provider in the sub-region while also leveraging potential synergies with health, sport/recreation and education facilities to become a sports/recreation and health precinct.

The framework proposes transit corridors between Cockburn Central and both Armadale and Fremantle. These will enhance accessibility for areas to the east and west. Also, extension of North Lake Road over the Kwinana Freeway to connect to Armadale Road will reduce the effects of through traffic. As Cockburn is an extensively established centre, the economic aim will be to increase the diversity and mix of land uses

within this centre. Given its location and existing train station, anchor businesses in the healthcare and social assistance industries will play an important role in providing a cross-section of services and job choice for local residents.

Kwinana

Kwinana is a key employment node with a mix of retail, health and some commercial/office-based employment. It will also be an important service centre designed to meet the needs of local residents. The opportunity also exists to target key support sectors, focusing on training provision for industrial activities.

Pinjarra

Pinjarra is retained as a secondary centre as part of the strategy to build on existing centres of community, retail and business activity. Key employment sectors will include retail trade, food and beverage services, education and public administration. Pinjarra will be supported by the Mandurah-Ravenswood-Pinjarra high-priority transit corridor.



Specialised activity centres

Specialised centres focus on regionally-significant economic or institutional activities that attract substantial numbers of people. These activities will be centred on key uses and include complementary activities. The clustering of complementary activities can deliver additional economic benefits. In addition to the existing specialised activity centre at Jandakot Airport, focusing on aviation and logistic services, a new centre is proposed at Karnup.

A review will be undertaken of the need for long-term tertiary and future ancillary use requirements at Ravenswood. These requirements may be located at the epicentre of the Pinjarra–Ravenswood urban area and supporting transport networks, in conjunction with the regional sports site and adjacent to the riverfront town centre.

Karnup (East)

Karnup (East) is a strategic opportunity to identify a site for longer-term public uses that is centrally located in the urban system between Rockingham–Kwinana and Mandurah–Pinjarra. It is located adjacent to a rail and/or transit station and also accessible via transit corridors. A Karnup specialised activity node could provide for a range of regional public facilities which may include education, health and other future ancillary uses.

The Murdoch specialised centre will act as a key employment node, servicing the south-western and south-eastern sectors predominantly. Although Murdoch is within the Central sub-region, this centre is easily accessible and well positioned to provide high-quality knowledge-based jobs.

Industrial centres

Strategic industry

Historically, most strategic industrial land in the Perth and Peel regions has been used by large-scale industries, often associated with the State's resources, such as oil refining and processing. The Western Trade Coast was created for strategic industry and comprises an agglomeration of activities including the Kwinana Industrial Area, Rockingham Industrial Zone, Australian Marine Complex and Latitude 32 industrial area.

The Kwinana Industrial Area and Rockingham Industrial Zone accommodate a cross-section of industries ranging from fabrication and construction facilities through to large-scale processing operations such as alumina, nickel, titanium and oil refineries. The area is served by deep-water port facilities and has access to regional road and rail networks.

It is projected that within the Kwinana Industrial Area and Rockingham Industrial Zone, 775 hectares of land will be required

by the time the population in the Perth and Peel regions reaches 3.5 million. The economic profile of the area is not proposed to change, with manufacturing remaining a dominant sector for employment.

The Australian Marine Complex at Henderson is a critical contributor to the export economy of the sub-region and has unique strategic values. Projections indicate that a further 42 hectares of industrial land is estimated to be required by 2050. Possible expansion into the Latitude 32 area may be considered in the future. The establishment of the Outer Harbour in the Cockburn Sound can provide the opportunity for synergies with the existing port operations at the Australian Marine Complex, which will be declared a technology park and will help drive trade development and industrial innovation.

Separate to the Western Trade Coast, in the Peel sector alumina refineries at Pinjarra and Wagerup process bauxite resources from the Darling Plateau. The mining and refining of bauxite will continue to be an important part of the local and State economy and a valuable source of employment. Future operations at both refineries will require additional land for residue and water storage, as indicated on Plan 3. In each case, any potential operational impacts are expected to be appropriately managed or addressed. This additional land will require further investigation to verify its suitability and these are classified as Industrial Investigation areas in the framework.

These strategic industries and land classified for this purpose, together with their buffer areas, will need to be protected from the encroachment of non-strategic and/or incompatible land uses.

Non-strategic industry

Excluding strategic industries, projections in the draft framework scenario indicate the potential total industrial land demand for the sub-region at 2050 will be about 5,900 hectares.

Measures to meet the need for future industrial land within the sub-region include utilising a combination of undeveloped land within currently-zoned Industrial areas, Industrial Expansion areas and Industrial Investigation areas.

The proposed network of industrial sites takes into account optimal proximity to workforce and service catchments, compatibility with adjacent land uses, accessibility to the freight network and, where possible, proximity to intermodal transfer facilities. Key elements of the non-strategic industrial proposals in the sub-region are outlined below.

Latitude 32

Latitude 32 comprises critical industrial land catering for light and general industries. The area will also include key intermodal transfer facilities that will ultimately integrate with the future Outer Harbour. Final land requirements for this facility are to be confirmed. Road and

rail infrastructure are needed to provide for the continued activation of the industrial precinct which provides extensive employment in manufacturing/transport and distribution sectors. Flexibility to respond to changing market demands will be critical in ensuring that the supply of industrial land caters for growing industrial needs.

Nambeelup industrial area

A new industrial area in Nambeelup will be developed as the Peel Business Park. The ongoing development of the business park is one of the key strategies for achieving a broader and diversified industry base to boost jobs in the Peel region. This is also one of the goals of the Peel Regional Investment Blueprint. The business park will be developed along best practice principles, including taking a comprehensive approach to drainage water and nutrient management in accordance with the District Water Management Strategy for Nambeelup.

Maddington Kenwick Strategic Employment Area

The Maddington Kenwick Strategic Employment Area is an expansion of the existing industrial area in proximity to the Kewdale intermodal transfer facilities and freight routes linking with Fremantle, Kwinana and Perth Airport.

Forrestdale industrial area

The Forrestdale industrial area will have two precincts (Forrestdale and South Forrestdale) with proximity to freight network connections

linking with the Perth Airport, Outer Harbour and Kewdale intermodal transfer facilities. The northern area will benefit in the short term from strategic industries establishing as anchor-point for smaller businesses to establish in the locality. Improved east-west road connections will provide longer-term benefits.

Mundijong (west)

Mundijong is a future industrial area that is expected to mainly cater for increased agriculture-related industries, including transport and logistics. Comprehensive district planning for the area will need to respond to the proposed intermodal facility and long-term realignment of the freight rail out of the developing Mundijong town centre.

Pinjarra

Expansion of the existing industrial precinct at Pinjarra is proposed so that it continues to provide localised employment opportunities for the Pinjarra community. This centre has good proximity to transportation routes.

Approximately 5,400 hectares of land is classified for future industrial needs. Marginal shortfalls exist at some specific locations due to limitations on the amount of land available for development, but sufficient alternative land is available within reasonable proximity of these locations. In the short term, there is adequate industrial zoned land to meet forecast demand in the south-western and south-eastern sectors. Some additional land is being

zoned for industrial purposes at Nambeelup to meet short/medium-term demand in the Peel sector.

Land classified as Industrial, Industrial Expansion/Investigation or Planning Investigation may contain significant environmental attributes and these classifications should not be construed as support for the development of land with these attributes. More detailed planning for these sites will need to prioritise avoidance and/or protection of these attributes. Minor refinement of expansion or investigation area boundaries may be required to accommodate more detailed future planning.

Industrial Investigation areas will require further detailed planning to be undertaken prior to consideration for rezoning under the MRS or PRS. The classification of these areas is not to be construed as a commitment by the WAPC to support any rezoning as this will depend upon the outcome of further detailed planning investigations. The specific matters that need to be addressed for these areas include, but are not limited to, those in Table 7.

Other employment opportunities

Tourism is also an important component of the Western Australian economy. It creates employment opportunities and supports additional recreation options for residents. Amenities and facilities including accommodation, dining/entertainment facilities as well as recreation infrastructure are vital to supporting the visitor economy.

High-amenity centres have the capability to be suitable locations for short-stay accommodation and entertainment for visitors. In this respect, the Rockingham and Mandurah city centres both have waterside locations and, in conjunction with this attribute, can offer a broad range of amenities and services. Opportunities to continue to integrate the tourism economy into these, and other waterside activity centres, should be encouraged. More natural settings such as the hills, national parks, State forests and some inland waterways can also provide a range of active and passive recreation opportunities for visitors.

In addition to supplying food for local consumption, agriculture and related industries provide local employment and support economic activity. Proximity to the local market and labour force is important for food processing and value-adding facilities. The sub-region's freight and logistics facilities are also vital to the export and import of food and agricultural commodities. Accordingly, it is important that the regions capacity for agricultural production and services should be facilitated and protected, land is retained for these uses and that freight and logistics infrastructure is protected.

District, neighbourhood and local centres will provide local employment opportunities and contribute to improving overall employment self-sufficiency. Employment opportunities will also be provided through bulky goods/light industrial areas that are not part of general industrial areas.



TABLE 7: Industrial Investigation areas – key considerations

Site	Key considerations
Cardup	Arrangements being made for the long-term protection of Bush Forever site 361.
West Mundijong – freight rail realignment	Determine land requirements for future realignment of the freight railway that currently passes through Mundijong.
Jandakot	Impacts, risks and management of Jandakot groundwater resources (existing Priority 2 Source Protection Area). Land to form part of the Jandakot Airport Specialised Centre. Determine specific land uses (e.g. light industrial in nature) and zoning to form part of the Jandakot Airport Specialised Centre and that are compatible with the P3 Drinking Water Source Area and the lands proximity to Jandakot Airport.
Munster	Located within Woodman Point wastewater treatment works buffer. Suitable non-residential uses yet to be determined.
Latitude 32 – future investigation areas	Located within Western Trade Coast area. Includes Urban Deferred zoned land within Western Trade Coast area – subject to further detailed planning to determine appropriate land use responses and a transition between the industrial areas and adjacent urban areas. Basic Raw Materials – sequential land use allowing for extraction of limestone and sand. Protection of Bush Forever sites and high value Carnaby's black cockatoo habitat.
Alcoa (Pinjarra)	Land for residue and water storage requirements relating to the mining and refining of bauxite. Having regard to the need for further investigations required to verify the suitability of these areas for the storage of residue and water. Protection of high value environmental values including Conservation Category Wetlands, Guildford Complex native vegetation and Threatened Flora and Ecological Communities.
Lot 1 Napier Road, Oakley	Confirmation that the transfer of existing industrial classification from the eastern Industrial Investigation area to the western Industrial Investigation area is compatible with the adjacent industrial land use.
Alcoa (Wagerup)	Land for residue and water storage requirements relating to the mining and refining of bauxite. Having regard to the need for further investigations required to verify the suitability of these areas for the storage of residue and water. Protection of viable patches of Guildford Complex vegetation.

Note: Detailed planning considerations may include additional matters and/or matters not identified at this time.

3.4 Community and social infrastructure

Objective

To provide a wide range of community and social infrastructure to enhance the health and wellbeing of the community and meet the community's needs including health, education and sport and recreation, while promoting infrastructure co-location and optimising the use of existing facilities and infrastructure.

Strategic direction and priorities

Community and social infrastructure required for the provision of health, education and sport and recreation services in the sub-region will need to accommodate a growing and ageing population. The focus for the sub-region will be the co-location of key community and social infrastructure to promote better use of existing infrastructure and facilities, reduce traffic movements and establish a sense of social cohesion by creating a key focal point for activity and the delivery of services to nearby residents.

Key community and social infrastructure proposals for the sub-region are represented in Plan 4. The provision of this infrastructure will be coordinated with the development of urban land and resultant population growth.

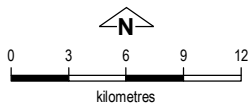
Further identification and/or refinement of relevant key social and community infrastructure requirements are possible as part of the review of Planning Investigation areas.

Education

Tertiary education facilities should ideally be located within strategic metropolitan centres or within activity centres with proximity to quality public transport, amenity and uses that allow for synergies with industry and business hubs and other educational facilities.

The sub-region includes Murdoch University campuses at Rockingham, Whitby and Mandurah (co-located with Mandurah TAFE). The needs of the future student population between Rockingham–Kwinana and Mandurah–Pinjarra can be met in part by the Murdoch University campus at Rockingham. However, capacity constraints at the Mandurah TAFE site will necessitate relocation of the Mandurah university campus in the long term. The Mandurah City Centre is the preferred location for the university, if a suitable site can be identified and progressed.

TAFE campuses that provide more generalised training for more localised catchments are located at Thornlie, Armadale, Rockingham and Mandurah. Specialised campuses providing for specific courses over large catchments are located at Jandakot, Munster, Henderson and Kwinana.



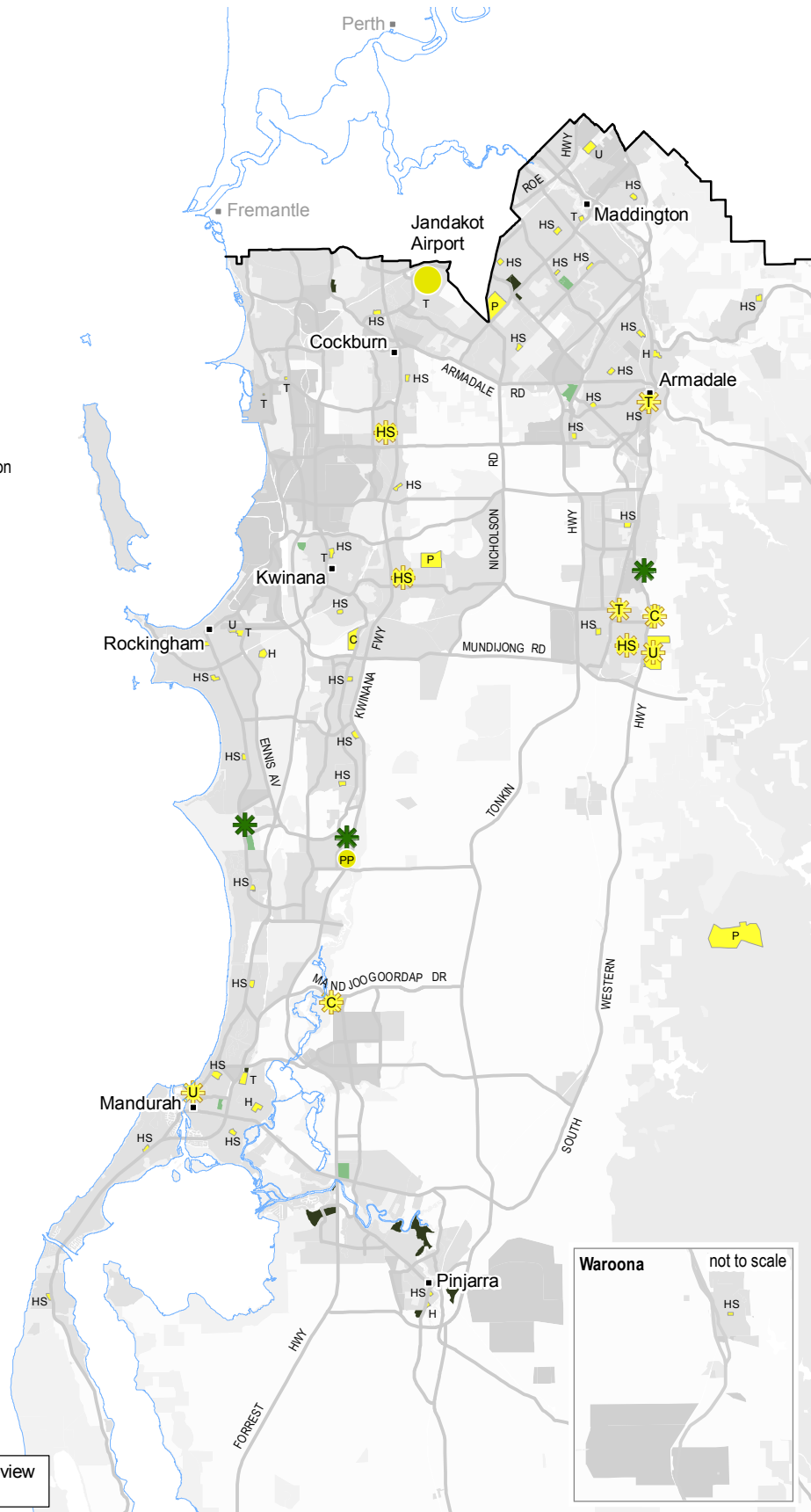
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Legend

- Open space - sport
- Open space - private recreation
- Proposed open space - sport
- Public purposes
- Proposed public purposes
- Specialised centre
- Specialised node
- HS High school
- T Technical school
- U University
- H Hospital/Health facility
- PP Public purposes
- C Cemetery
- P Prison



PLAN 4: Community and social infrastructure



Over the long term, priority may be placed on having larger TAFE campuses located close to high-quality public transport to improve access for students and maximise campus catchment area. Long-term planning includes options to expand Rockingham and Mandurah campuses in line with the State's workforce development priorities as well as the requirement to develop an additional campus for the Mundijong-Whitby area, subject to strong training demand evidence and a lack of training capacity at this location.

It is anticipated that up to 32 new high schools will be required in the greenfield urban areas. Sites for these are normally determined as part of district structure plans and in accordance with *Liveable Neighbourhoods* principles.

Regional health facilities

Existing regional health facilities are located at Armadale, Rockingham, Mandurah and Pinjarra. While population growth over time will result in increased demand for regional health facilities, the shorter-term future focus will be to optimise the use of existing sites in preference to the development of facilities on new sites within the sub-region. Notwithstanding, while no facility is currently planned, about eight hectares of land is to be retained as a potential long-term option at Karnup (East).

Sport and recreation

The predicted population growth will result in increased demand for additional regional and district-level sporting space within the sub-region that will be met through a combination of existing and new sites. The future use of existing sites and facilities will be maximised to cater for some of this additional demand. However, future sites for regional sports facilities to meet the needs of greenfield developments have been identified in the following locations:

- Haynes (Twelfth Road) — 64 ha;
- Cardup — 40 ha;
- City of Cockburn (about 20 ha) — investigate site options (see Table 8);
- Lark Hill — about 20 ha;
- Karnup (East) — 50 ha; and
- Ravenswood — 56 ha.

New open space areas requiring irrigation will need to investigate non-potable water supply options guided by relevant water management strategies.

Cemeteries

The two main existing cemetery sites within the sub-region are located at Rockingham and at Whitby. To meet the long-term needs, enlargement of the Whitby site, as well as an additional site in Keralup, will be required.



3.5 Movement and access

Objective

To provide an efficient and effective regional movement network for people and freight that is integrated with land uses, links key economic and employment opportunities and connects the sub-region to the greater Perth and Peel regions as well as the south-west of the State and the Wheatbelt.

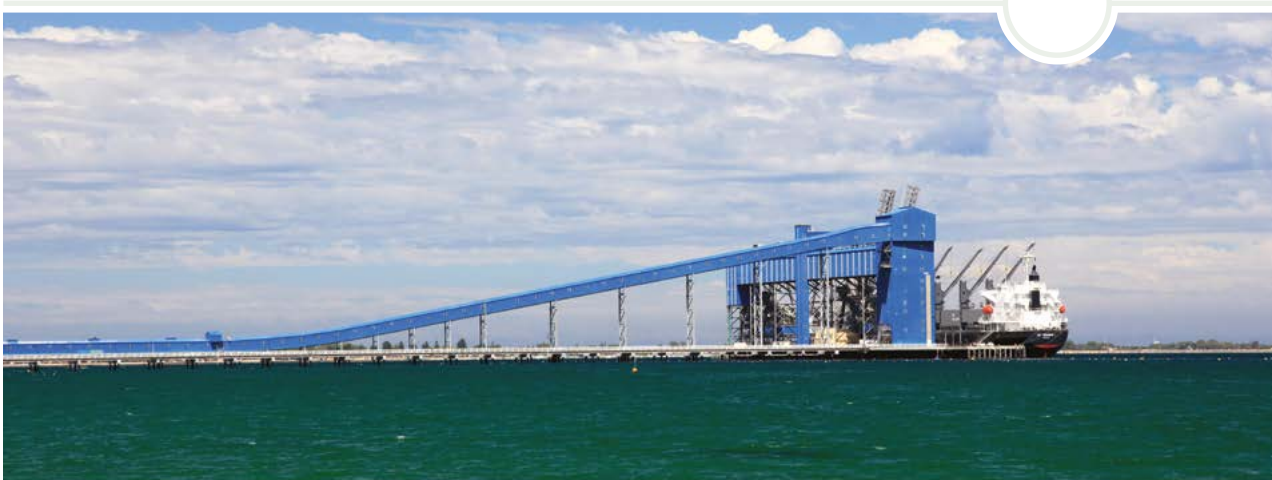
Strategic direction and priorities

Projected population growth will place additional pressures on all levels of the existing road and rail transport network within the sub-region for the movement of people and freight. Accordingly, the framework has been developed in close collaboration with the Transport portfolio.

To accommodate population growth and ensure efficiency of the movement system is not compromised, the framework recognises the need to integrate urban and employment nodes with transport infrastructure and services. The framework also proposes upgrading and adding new transport infrastructure to the network.

The movement network within the sub-region will continue to have a significant function to perform within the Perth and Peel context, and be important to the Western Australian economy, by facilitating the movement of people and freight at the metropolitan, State and national levels. This includes road network linkages to the Western Trade Coast industrial areas, naval facilities, the future Outer Harbour port facilities, as well as linkages to the Perth CBD and other regional areas such as the south-west.

A challenge for the sub-region is to ensure key roads are appropriately managed and upgraded over time to facilitate future transport efficiency. It is also necessary to ensure that existing services are improved and that feasible public transport infrastructure and



services are provided to assist with alleviating future road congestion and to support urban consolidation that results in well-connected communities in infill and greenfield areas. This includes priority public transport initiatives as part of METRONET and removing some level crossings to improve traffic movements and safety.

The integration of key centres with high-quality public transport networks is a key principle of the framework. Public transport infrastructure has been prioritised through METRONET, to support activity centres and deliver sensitive, sustainable and vibrant communities as part of station precincts or larger activity centres. METRONET also proposes to

remove some level crossings to improve traffic movements, safety and amenity. This strategic infrastructure investment will provide additional opportunities for infill.

The provision of transport infrastructure will be coordinated with the development of urban/ industrial land and activity centres, based on the anticipated timing outlined in Plan 11 and Table 10.

Further refinement of networks may be required as part of the review of Planning Investigation areas.

Public transport

An effective and adaptable public transport network will be a key mechanism for achieving greater sustainability. Improved public transport will be required to meet the transportation needs arising from population growth and to meet the need to connect people to key employment nodes. Additionally, 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.

The proposed public transport network for the sub-region includes an integrated network of passenger rail lines and transit corridors.



Passenger rail infrastructure will meet the need for higher-speed longer-distance travel to the Perth CBD and inner areas and to support strategic centres in the outer sub-regions. Passenger rail infrastructure proposed for the sub-region includes the following Stage 1 METRONET proposals:

- extending the Thornlie rail line to Cockburn Central – with stations at Nicholson Road and Ranford Road (also forms part of a proposed future Circle Line);
- extending the Armadale rail line to Byford – with the station being located to integrate with Byford and surrounding localities; and
- an additional station on the Mandurah rail line at Karnup.

Further investigation is required for the following longer term passenger rail infrastructure options:

- completing a proposed future Circle Line that connects the Joondalup, East Wanneroo/ Ellenbrook, Midland, Armadale, Mandurah and Fremantle rail lines – including extending the Forrestfield-Airport rail line to connect to Thornlie rail line and connecting the Thornlie rail line to Fremantle;
- better integration of the Australind service with the metropolitan passenger rail service between Perth and Mundijong to improve operational efficiency;

- potential strategic additional southern metropolitan rail line as well as possible further high-speed extension to Bunbury in the long term; and
- a long-term contingency station on the Mandurah rail line at Gordon Road.

All non-Stage 1 METRONET public transport proposals are subject to further investigation and will be refined as part of a future review of the frameworks.

Investigations are ongoing in relation to the identification of a site for a stabling facility to support the provision of additional passenger services on the Mandurah rail line. This site must be located south of, but near to the Rockingham station and have direct connection to the Mandurah rail line. A site north of Safety Bay Road is preferred. However, further detailed investigations are required to confirm the location of this facility.

In light of the capital investment required to provide rail stations, it will be necessary to maximise land use opportunities in areas adjacent to this infrastructure. This may include providing car parking options that deliver improved land use integration.

The sub-region's passenger rail network will be supported by a network of High Priority Transit Corridors (HPTC) and High Frequency Transit Corridors (HFTC) that will provide public transport connections between activity centres, population catchments, rail stations and local bus services.



Both corridor types feature a high frequency of services, with HPTCs featuring infrastructure that will facilitate priority over other traffic. Future planning investigations and/or transport modelling may identify the need for new or upgraded transit corridors.

The network of transit corridors corresponds with the distribution of key activity centres, related urban catchments and will integrate with passenger rail and local bus services. These are the priority for improving on-road public transport services. They will support access to, and employment generation in, key centres and the delivery of higher-density urban form outcomes. However, urban

development should not impact on the capacity of the transit corridor network which is essential for effective transport functions.

Key components of the network include the following HPTCs:

- Fremantle-Cockburn Coast-Kwinana-Rockingham;
- Fremantle-Cockburn Central-Armadale;
- Baldivis-Warnbro; and
- Mandurah-Ravenswood-Pinjarra

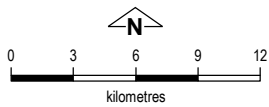
Future planning investigations and/or transport modelling may identify the need for new or upgraded transit corridors. In this respect, further

investigations are proposed for the Rockingham-Karnup corridor and its possible upgrade from a high-frequency to high-priority transit corridor.

Additional priority infrastructure will also be required for short sections on multiple roads at the approach to most rail stations.

Bus services are also an important part of a comprehensive and integrated public transport network. Improving connectivity between bus and rail networks will increase accessibility to the CBD and key centres and reduce commuting times.





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Legend

- Passenger rail/station - existing
- Passenger rail/station - Stage 1 METRONET
- Passenger rail - further investigation
- Proposed high-priority transit corridor
- Proposed high-frequency transit corridor

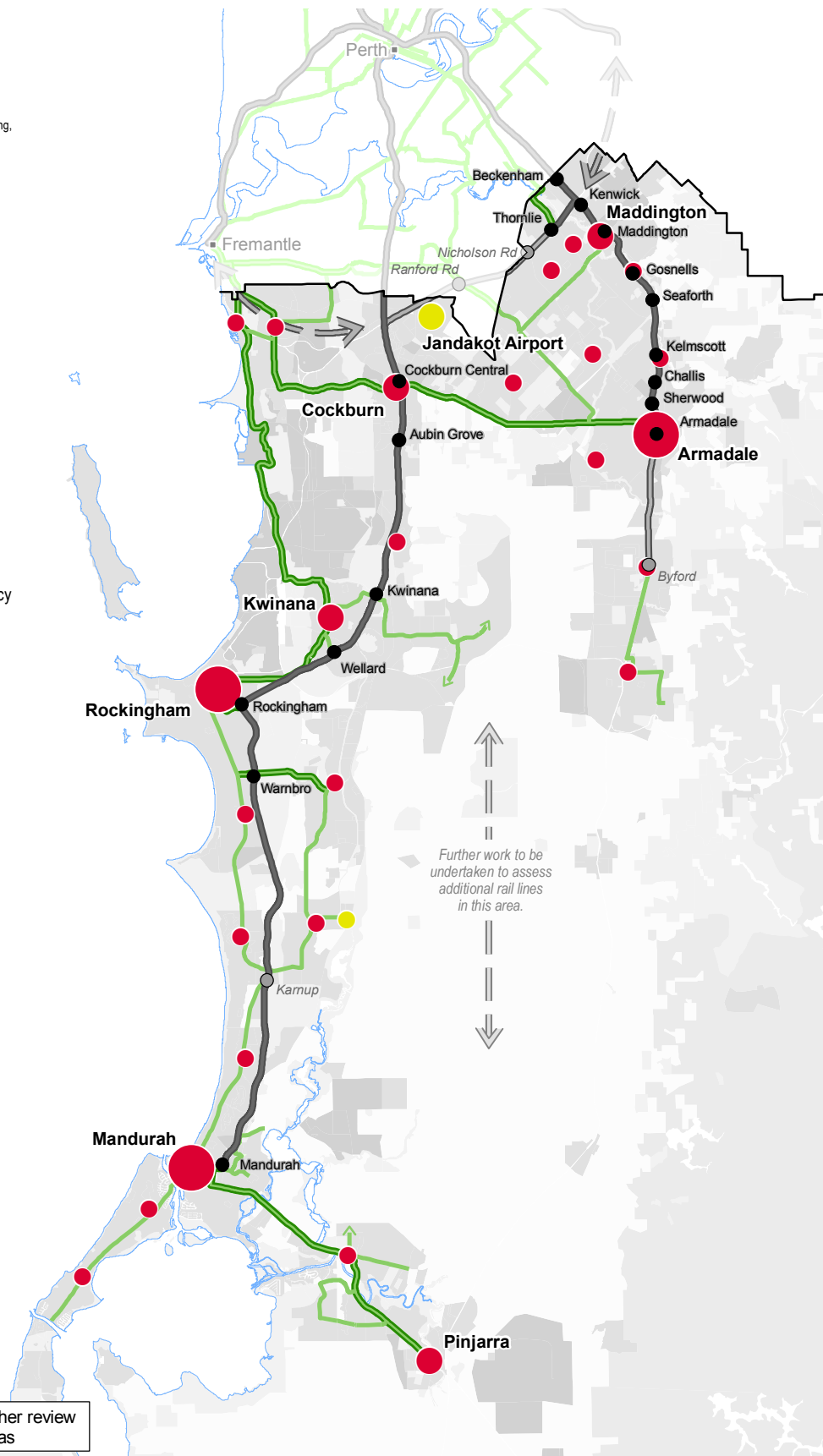
Activity centres

- Strategic metropolitan
- Secondary
- District
- Specialised centre
- Specialised node

All non-Stage 1 METRONET public transport proposals are subject to further investigation and will be refined as part of a future review of the frameworks.

INDIAN
OCEAN

Proposals are subject to further review of Planning Investigation areas



PLAN 5: Public transport



These key public transport initiatives, developed with the Transport portfolio, are shown in Plan 5.

Regional roads

Even with major increases in public transport for a more sustainable city, population growth will increase demand on the regional road network. To meet this demand, both increased capacity in the existing road system and expansion of the network will be required.

By 2050, the Kwinana Freeway and Tonkin Highway will provide the main network for north–south road movement within the framework area. Also, the sections of Roe Highway (east of the Kwinana Freeway) within the framework area will form part of the network for the broader Perth and Peel regions, including minor westward extension from the Kwinana Freeway to connect to the Murdoch activity centre.

The sub-region's future regional road network includes a number of new and upgraded primary distributor and integrator arterial roads, as shown on Plan 6.

The proposed extension of Tonkin Highway southward will connect with the Forrest Highway south–west of Pinjarra and carry a significant share of the increased north–south and through-movements, including critical freight movements, expected along the network.

Future extensions, realignments and/or upgrading of Rowley, Anketell, Thomas, Mortimer, Mundijong, Henderson, Lakes, Old Mandurah and Pinjarra Roads are proposed. These will provide vital east–west freight linkages between the future Outer Harbour and freight logistics centres in the region, other major road linkages, strategic industrial locations, future development in the Pinjarra–Ravenswood sector as well as provide for transit corridors within the sub-region.

It is also proposed to extend Mandjoogoordap Drive further eastwards across the Serpentine River to connect through to the proposed extension of Tonkin Highway.

Southward extension of Nicholson Road to connect with Mundijong Road will ensure the protection of a strategic north–south transport corridor for both freight and general traffic and to complement the Kwinana Freeway and Tonkin Highway.

The Southern Link Road, which is the subject of further investigations, will connect Mundijong Road with Albany Highway and Brookton Highway and provide a more direct link for freight movements between the Outer Harbour and hinterland areas.

Realignment of South Western Highway and reconfiguration of the western section of Pinjarra–Williams Road is likely to be required in the long term, as part of the ultimate upgrade of Tonkin Highway with grade-separated interchanges.

Additional road connections and networks are also proposed. The road classifications are currently under review by Main Roads WA, which may result in future changes.

Armadale–Wungong

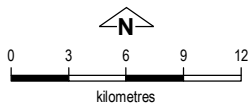
Easterly extension of Rowley Road to connect with Wungong Road, extension and upgrading of Wungong South Road and extension of Eleventh and Twelfth Roads are proposed. Possible southward relocation of the intersection of Forrest Road with Tonkin Highway (for future connection with Oxley Road) could be explored.

Byford–Cardup–Mundijong network

Additional linkages will be provided between road networks proposed in the existing Byford and Mundijong district structure plans and will include extension of Doley Road and realignment of the southern portion of Malarkey Road. Some refinement of east–west connections may be appropriate, including westward extension of Norman Road to connect to Bishop Road.

Cockburn–Jandakot

Berrigan Drive will be extended (east of its junction with Jandakot Road) through the western and northern sectors of the airport to connect with Ranford Road. Jandakot and Warton Roads will become integrator arterial roads. Armadale Road is to be realigned to connect to North Lake Road via the new Armadale Road bridge.



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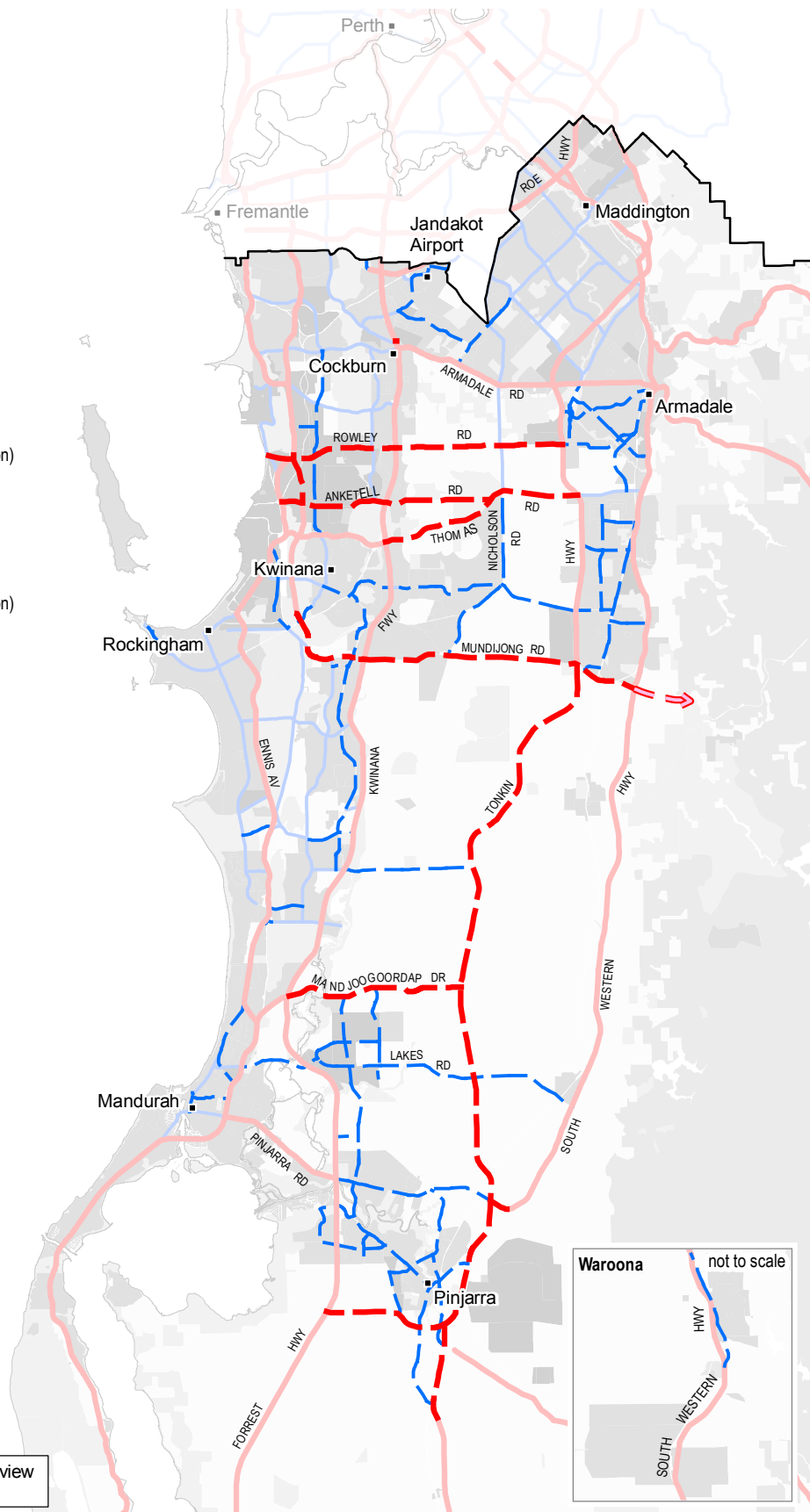
Primary distributor

- Existing (MRS/PRS reservation)
- - - Proposed
- Indicative

Integrator arterial

- Existing (MRS/PRS reservation)
- - - Proposed
- Indicative

INDIAN
OCEAN



Proposals are subject to further review
of Planning Investigation areas

PLAN 6: Regional roads



Spearwood–Wattleup–Postans

A new north–south route connecting Spearwood and Gilmore Avenues with opportunities for a lateral connection to the potential north–south route is proposed. These will service and connect people to the Latitude 32 industrial area.

Kwinana–Rockingham–Karnup

The following new connections will complete the existing network in this sector:

- Nairn Drive will connect to Wellard Road — via Kerosene Lane and Baldivis Road with a direct grade-separated crossing over the railway;
- Stakehill Road will be extended west to Warnbro Sound Avenue and upgraded east of Nairn Drive;
- Dampier Drive will be extended east of Ennis Avenue to Nairn Drive; and
- Baldivis Road will be extended south to join Anstey Road.

Pinjarra–Ravenswood and Nambeelup

Three inter-connected integrator arterial road networks will serve industrial development at Nambeelup as well as any future development at Ravenswood and West Pinjarra/South Yunderup, focusing on key centres at Pinjarra and Ravenswood. Pinjarra Road may require upgrade with additional lanes, in parts, between Mandurah and South Yunderup Road.

Future development options in Ravenswood and West Pinjarra/ South Yunderup would also require corresponding connections to the Kwinana Freeway/Forrest Highway at Rogers Road and Beacham Road (north-facing ramps) to support development and ensure balanced transport outcomes.

Freight

The volume of freight movement on the regional road and rail networks will increase substantially by 2050. This increase will be centred on interstate road and rail routes, particularly those servicing port facilities and connecting with existing and proposed intermodal terminals located at Kewdale, Latitude 32, Bullsbrook and Mundijong. Overall, the proportion of freight on rail is expected to increase.

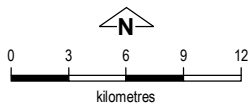
The 2050 network is shown on Plan 7. Other future road corridors that will be investigated for possible inclusion in the freight network include the Southern Link Road, Mandjoogoordap Drive (between Kwinana Freeway and Tonkin Highway) and the proposed South Western Highway Deviation.

Other proposals include realignment of the freight railway that currently passes through Mundijong, to the western side of the future urban area, to improve the amenity of Mundijong and ameliorate severance effects. Minor realignment of the freight rail in Waroona is also required as part of the longer term realignment of South Western Highway in Waroona.

An assessment of options is also underway to identify additional freight rail infrastructure connecting to the Kwinana Industrial Area to deal with capacity limitations at the 'Kwinana Triangle'.

The classification of networks in the area marked as 'Subject to Westport freight investigations' in Plan 7 is currently subject to review as part of the *Westport: Port and Environs Strategy*.

The freight network is critically important to the Western Australian economy. Where practicable, these transport corridors will be protected 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.



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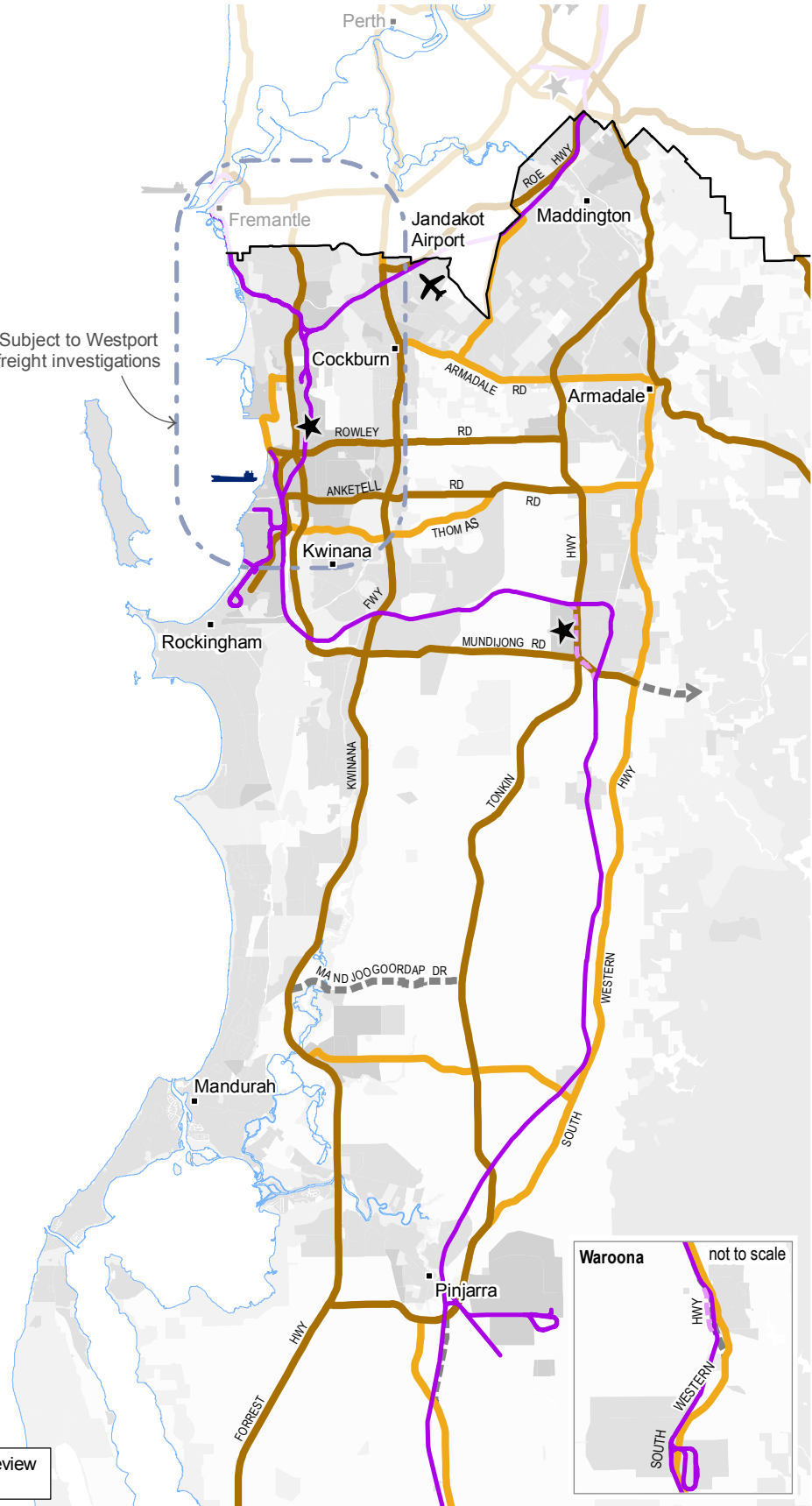
Legend

- Airport
- Port
- Intermodal freight terminal
- Freight rail
- Freight rail - investigation

Freight roads

- Primary
- Secondary
- Investigation

Subject to Westport
freight investigations



Proposals are subject to further review
of Planning Investigation areas

PLAN 7: Freight, ports and aviation



Ports

Population growth to 3.5 million people will bring about a significant increase in ship movements and related increases in freight handling and storage, road and rail transportation. Additional container port facilities will be required to service the growing needs of the State. Research has identified an area within Cockburn Sound, between James Point and Naval Base, as the most suitable location for development of additional container port facilities. Future port facilities will be subject to further planning by the Westport Taskforce.

Aviation

In the event that existing general and civil aviation airports may not be adequate to meet the needs of the Perth and Peel regions by the time the population reaches 3.5 million people or more, additional aviation infrastructure will be required. Planning studies to identify suitable locations for future aviation infrastructure, should these be needed, are currently being undertaken.

Active transport

Provision of a network of on-road and off-road paths for cyclists and pedestrians offers commuters an alternative to private car trips as well as providing recreation opportunities and health benefits. At the regional level, it is intended that principal shared paths be provided along major transportation reserves. Also, more detailed arrangements for integrating a comprehensive pedestrian and cycling network throughout urban areas, including connections to rail stations, will be determined through district and local structure plans and in consultation with local government.



3.6 Service infrastructure

Objective

To ensure the timely, efficient and cost-effective delivery of electricity, water, wastewater and other service infrastructure that is aligned with the staging of development and encourage the shared use of infrastructure corridors by the various service providers.

Strategic direction and priorities

Development of new urban and industrial sites in the sub-region, in addition to the intensification of established urban areas, may require significant upgrades and additions to the network of essential service infrastructure. It is important that new and infill development avoids and minimises (where necessary) encroachment upon this infrastructure, to ensure the safe and reliable provision of essential services.

The framework seeks to maximise the use of and add value to existing infrastructure, in order to minimise ongoing maintenance and operational costs. Alignment between the development industry

and servicing authorities will be necessary to ensure that the release of land for housing and employment purposes is commensurate with anticipated population growth. In this regard, servicing of growth areas will be expected to occur through the progressive extension of development fronts. The delivery of infrastructure will be staged and coordinated with the supply of urban and industrial land to improve coordinated service delivery and ensure the timely and cost-effective supply of serviced land.

The future provision of transport and other service infrastructure within the sub-region has, where possible, been planned within shared corridors contributing to the efficient use of land. The shared corridors have avoided and, where necessary, minimised the impact upon environmental attributes, landscapes and conflicting land uses.

Improved technology may provide servicing efficiencies which may impact on demand for, and the need to supply, future infrastructure. It will also be necessary to identify and /or protect sites for regional service infrastructure provision.

Existing and proposed service infrastructure is shown in Plan 8. Further refinement of service infrastructure may occur, if required as part of the review of Planning Investigation areas.



Electricity supply

Electricity is distributed to the sub-region through a network of 132 kV and 330 kV bulk transmission power lines that connect to the local power distribution network via transition terminals and sub-stations.

The future supply of electricity will require the upgrading of the existing electricity network including extensions to transmission lines and construction of new terminals in Hope Valley, Oakford, Hopeland and Ravenswood (east of the Urban Expansion areas) and with new substations throughout the sub-region. Upgrades to, or expansion of, the transmission network will include new 132kV and 330 kV transmission lines between existing and proposed terminals and substations.

Traditional electricity infrastructure may be complemented by more innovative electricity supply models such as microgrids, embedded renewable energy generation and energy storage systems.

The need for, timing and delivery of these services will require further investigation through more detailed planning within the sub-region.

Water supply and wastewater

Existing water supply infrastructure that serves the sub-region includes several key water sources including surface water, groundwater and desalinated seawater. Water is transferred from sources to treatment and storage facilities by trunk mains.

Conceptual water supply planning for the western sector indicates the likely need for additional storage facilities in Munster, Orelia and Baldivis (Karnup Tank and Tamworth Hill Reservoir) to serve future urban development and infill development in the western sector.

In the eastern sector major water storage reservoirs will be necessary in the escarpment near Byford Tank (Byford), Mundijong Reservoir (Jarrahdale) and Canns Road Tank (Bedfordale), to serve long-term urban development in this sector.

In the Peel sector storage reservoirs and tanks will be necessary at Bouvard, Nambeelup, Pinjarra and Parklands, to serve new urban areas.

In the longer term, when the capacity of the Binningup Desalination Plant is expanded, the Stirling Trunk Main may need to be duplicated where it traverses the southern parts of the sub-region.

The sub-region is currently served by water resource precincts at Woodman Point, Kwinana, Postans, Point Peron, Waterworks Road (Haynes) and Gordon Road (Mandurah) as well as by smaller plants at Halls Head, Caddadup

and Pinjarra. The Water Corporation has recently commissioned the first stage of a major wastewater treatment plant in the East Rockingham industrial area.

Sites have been reserved at Port Kennedy and Tim's Thicket, south of Dawesville, for a possible future water resource precincts and/or disposal facility. Another site has been secured at Nambeelup for possible future treated wastewater re-use or disposal. Additionally, an existing site in Port Kennedy will be retained for possible future treated wastewater re-use.

Trunk corridors will be required alongside the Kwinana Freeway (Ravenswood) and Lakes Road for wastewater pressure mains to connect with the Gordon Road wastewater treatment plant in the long term. Trunk corridors will also be required between the Gordon Road wastewater treatment plant and the possible treated wastewater re-use/ disposal site at Nambeelup.

The Water Corporation has planned water and wastewater services for all land currently zoned Urban and Urban Deferred in the sub-region. Urban Expansion and Investigation areas are capable of being serviced within the timeframe of the framework, subject to the staged provision of new and/or upgraded infrastructure. However, these will require detailed investigation prior to zoning to ensure the orderly and financially sustainable provision of water and wastewater services. Further investigations are required to confirm servicing capabilities for Planning Investigation areas.

Drainage

In the past, an extensive network of rural drains was developed in the flat low-lying part of the Swan Coastal Plain, east of the Peel–Harvey Estuary and the Serpentine River. Ongoing improvement and effective management of this drainage network will be critical to assist in addressing water quality and quantity challenges within the Peel–Harvey catchment.

Areas classified for development in the framework will be required to address the management of drainage systems to ensure that biodiversity and ecological functions and water quality of wetlands and waterway systems are maintained, that people and property are protected from the risk of flooding and inundation, and that amenity of public open space is enhanced.

Modification of existing rural drains to incorporate best practice water-sensitive urban design and nutrient management may be required and could include the use of detention basins, amended soils and/or nutrient-stripping facilities. Subsequent levels of planning for drainage in the sub-region will be guided by the regional water management strategy prepared to support the framework. The future development of alternative, fit-for-purpose water sources and the use of innovative technologies such as managed aquifer recharge also provide opportunities to more effectively manage the existing drainage network.

Other services

The sub-region accommodates the Parmelia Gas Pipeline and Dampier to Bunbury Natural Gas Pipeline. These major gas pipelines traverse the sub-region (generally in a north–south direction) and will need to be incorporated into the future development in areas such as Baldivis, Nambeelup and North Dandalup.

Gas and telecommunications infrastructure will be progressively supplied to the growth areas of the sub-region as development proceeds. Planning decisions regarding telecommunications infrastructure will continue to be guided by *State Planning Policy 5.2 Telecommunications Infrastructure*.

The key waste management sites within the sub-region include Henderson Waste Recovery Park,

Millar Road landfill and recycling facility, Armadale landfill and recycling facility, Mandurah Waste Management Centre and the Tim's Thicket Septage and Inert Waste Disposal Facility. Consolidation of existing waste facility sites and co-location of waste facilities with other compatible industries and infrastructure can potentially meet most short-to-medium term waste infrastructure needs in the Perth and Peel regions.

The *Western Australian Waste Strategy: "Creating the Right Environment"* identifies long-term waste and recycling infrastructure planning as a key strategic response to the challenges facing waste management in the State. A range of investigations are currently being undertaken to identify strategic waste infrastructure sites required in the long-term.



3.7 Environment and landscape

Objective

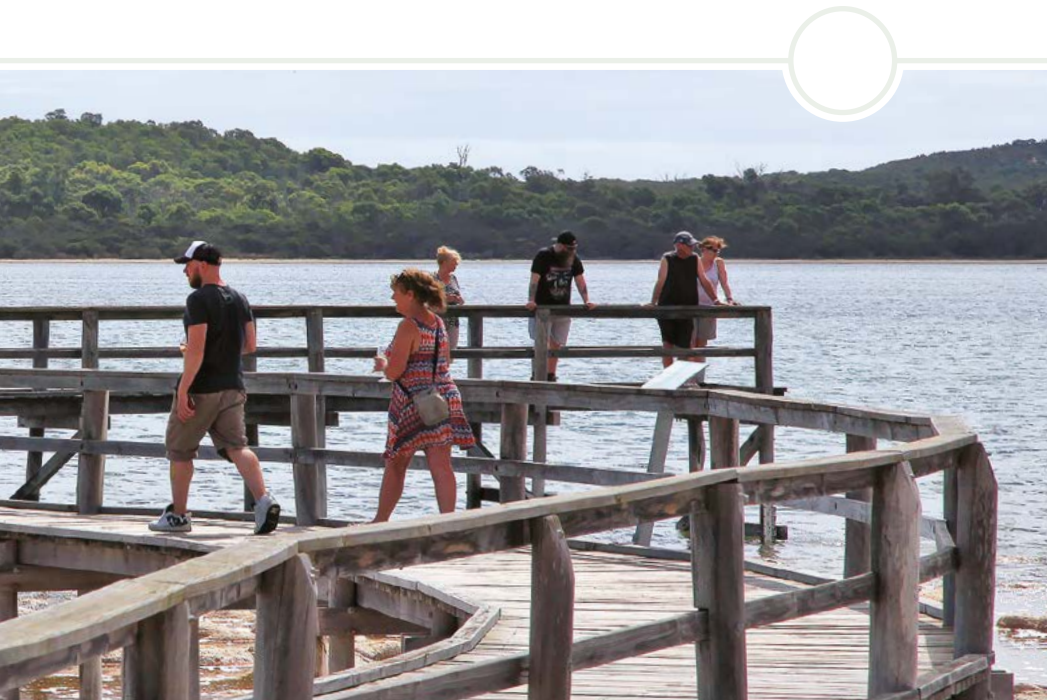
To preserve and enhance the environmental and landscape values of the sub-region for future generations to enjoy.

Strategic direction and priorities

The sub-region has significant environmental attributes resulting in over 229,750 hectares, or 51 per cent, of the sub-region being protected as either Parks and Recreation, Regional Open Space, State Forest or Waterways reservations under the MRS and PRS, which includes some Bush Forever sites. Reserved land containing key environmental and landscape features within the sub-region is shown on Plan 9. Protected environmental features within the sub-region include:

- most of the 130 kilometres of coastline;
- the Peel–Harvey Estuary and its foreshores;
- lake and wetland chains and portions of limestone ridges that parallel the coast;
- linear reserves along parts of the Canning, Serpentine and Murray rivers;
- some portions of the Darling Scarp;
- extensive areas of jarrah forest in the Darling Plateau held within State forests and several national and regional parks that encompass the steeper valleys of the western portion of the Darling Plateau; and
- the coastal lake system and tuart forest south of the Peel–Harvey Estuary.

The sub-region also includes some valued landscapes with both natural and rural character, including limestone ridges with tuarts, portions of the coastal plain in which remnant paperbarks and sheoaks are scattered through pasture, market gardens associated with wetlands, multiple waterways, the Darling Scarp and orchards in narrow valleys in the Darling Range.



Environmental and landscape values have been considered in the identification of new areas for urban and industrial development. This development will result in changes to the existing landscape character of the affected localities, particularly along the Kwinana Freeway, in the vicinity of Karnup, Nambelup–Ravenswood–West Pinjarra, inland and south of Armadale. The challenge will be to retain or create a 'sense of place' by maintaining key individual landscape characteristics and vistas in areas that may be subject to large-scale landscape change.

The sub-region has three key environmental attributes that play a part in attracting population growth:

- the coastline, the character of which ranges from natural areas to developed recreational, industrial and commercial areas incorporating marinas at Coogee, Mandurah and Dawesville;
- the hills landscape, with several low-density settlement enclaves within the extensive forested surface catchment areas; and
- the extensive estuarine/riverine systems, including the Peel-Harvey waterways.

These areas will be subject to additional pressure to meet recreation and tourism demands. In addition, the increased risk of bushfire in a drying climate and anticipated future sea level rise need to be considered. Sea level rise will impact on the estuarine

system and the waterways that enter it. Planning for and/or development of these areas, including for existing and infill development, will need to have regard to projected sea level rise.

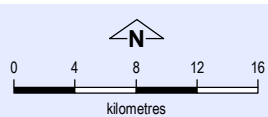
The sub-region's natural areas also provide opportunities for recreation and greater involvement and interest in natural areas. Opportunities to further integrate conservation and recreation land uses should be investigated in order to meet the requirements of the sub-region's future population. Large parts of the sub-region are covered by State forest reservations, which contain a variety of uses, such as forestry, mining, recreation and heritage. There needs to be a continued focus on balancing these uses with broader environmental outcomes within State forest areas.

Urbanisation and agricultural use of the sub-region has led to fragmentation of some natural areas, resulting in small patches of remnant vegetation, reduced habitats and isolated populations of native fauna. To strengthen and increase the capacity of these natural areas, the framework identifies ecological linkages – the connection of these fragmented sites to one another – to assist in fauna dispersal and migration. Ecological linkages will be supported by a green network (green spaces, water management systems and green streets contained within public and private realms) to deliver multiple environmental, economic and

social benefits. These linkages will support both the general health of flora and fauna in the sub-region and existing Commonwealth and State environmental legislation that protects priority species. Linkages will need to be considered and implemented through more detailed planning.

The framework proposes:

- concentrating new urban areas in predominantly cleared pastureland rather than impacting on areas with regionally-significant conservation values;
- future reservation of further land and waterways with environmental and/or biodiversity values of particular importance;
- identification of ecological corridors where conservation values may be protected in ways incidental to the ongoing use of the land; and
- measures be taken to improve the Peel-Harvey Estuary and Swan-Canning River's water quality.



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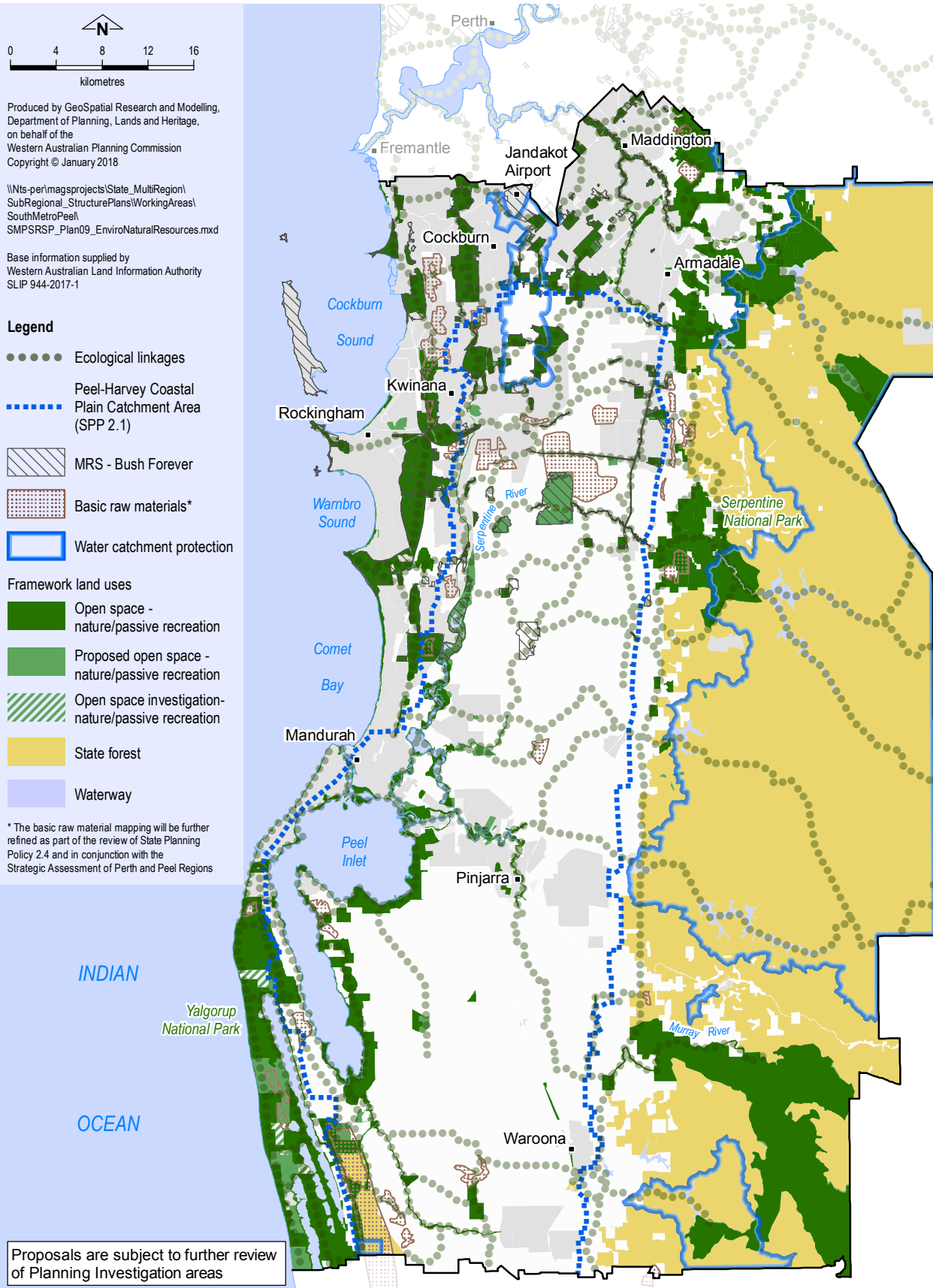
Legend

- ● ● ● ● Ecological linkages
- ■ ■ ■ ■ Peel-Harvey Coastal Plain Catchment Area (SPP 2.1)
- ▨ MRS - Bush Forever
- ▤ Basic raw materials*
- ▭ Water catchment protection

Framework land uses

- Open space - nature/passive recreation
- Proposed open space - nature/passive recreation
- ▨ Open space investigation - nature/passive recreation
- State forest
- Waterway

* 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



Proposals are subject to further review of Planning Investigation areas

PLAN 9: Environment and natural resources



Expanding the green network

The development of land to provide housing, jobs and infrastructure will place increased pressure on environmental values. The framework proposes the following key additions to the green network:

- the Serpentine River and foreshore areas in Baldivis, Karnup and Keralup, as well as more than 1,100 hectare site at Lowlands;
- Nambeelup Brook and related areas with high conservation value;
- consolidation of Yalgorup National Park in Clifton. This includes:

- land immediately north and south of the Preston Beach townsite (more than 900 hectares previously subject to the Preston Beach Townsite Strategy, including 58 hectares of Urban zoned land); and
- multiple landholdings located in Bouvard, Clifton and Preston Beach.

Some proposed Open Space/ Open Space Investigation areas are classified in conjunction with the classification of land for more intensive development. Where appropriate, this land will be required to be ceded as part of subdivision. The Open Space classifications in the framework do not necessarily require that the land be reserved for future acquisition.

Other open space areas that do not form part of proposals for more intensive development will require further investigation of environmental attributes, their strategic importance as part of the green network and/or contribution towards the orderly and proper planning of a locality.

Open Space Investigation areas have been subject to preliminary assessment however require further investigation to be undertaken prior to consideration for future protection and/or reservation under the MRS or PRS. The classification of these areas should not be construed as the WAPC's support for future protection and/or reservation, as this will depend upon the outcome of further investigations.

Some additional open space areas may be identified as part of further review of Planning Investigation areas.



Peel-Harvey Estuary

Much of the sub-region lies within the catchment of the Peel-Harvey Estuary and its associated network of wetlands and rivers. The Peel-Harvey Estuary is part of the internationally-listed Peel-Yalgorup Ramsar wetland system that comprises:

- Peel-Harvey Estuary;
- Yalgorup lakes (including the Clifton, Preston, Pollard, Hayward, Boundary, Martins Tank and Newham lakes);
- Lake McLarty;
- Lake Mealup; and
- Goegrup and Black lakes.

The sub-region also contains two other listed Ramsar wetlands including the Becher Point wetlands and Forrestdale and Thomsons lakes. As well as having

environmental values formally recognised through State and Commonwealth environmental legislation, these waterways provide an economic, recreational and cultural asset that is of vital importance to local communities.

However, recent evidence indicates that many of these waterways are under significant stress or are even declining in health. In recognition of the importance of these wetlands, the State Government is working with State and national organisations to ensure threats to the wetlands' health are addressed.

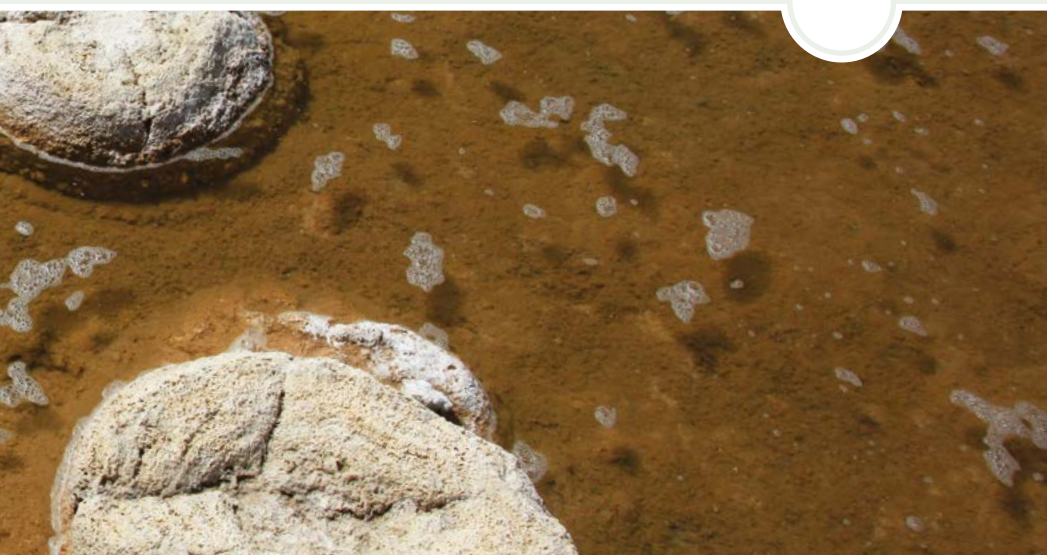
New development will need to address relevant Peel-Harvey considerations, primarily by ensuring there is an acceptable reduction in nutrients and sediment released into waterways. Measures may include potential alternatives to basic raw materials that are currently being investigated and/

or accommodating drainage intervention works in targeted locations. However, change of land use within the catchment (e.g. rural to urban) is not proposed as a measure to improve water quality in isolation from other relevant planning and environmental considerations.

A number of important measures to maintain and improve the long-term health of the Peel-Harvey Estuary and broader Peel-Yalgorup wetland system are being investigated. Key measures being considered to reduce nutrient inflows and improve water quality include:

- soil testing, reporting and independent agronomic advice in the Peel-Harvey coastal catchment;
- a greater uptake of soil amendments to reduce nutrient runoff and leaching;
- a long-term drainage intervention program for the Peel-Harvey catchment;
- preventing new high nutrient export activities on soils with a low phosphorus retention capacity; and
- the monitoring of water quality improvements and reporting on the catchment's health.

An overall integrated water management approach will be required prior to further development being considered within the Peel-Harvey catchment. This will include review of *State Planning Policy 2.1: Peel Harvey Coastal Plain Catchment*.



3.8 Natural resources

Objective

To manage the availability and use of natural resources to ensure existing and potential land uses can be balanced against broader environmental outcomes.

Water resources

Water sources serve a critical function for supplying private self-supply, public scheme water supply and water for the environment, including wetlands and ecosystems. Urban landscaping, lakes and wetlands all contribute to the outdoor lifestyle enjoyed by the community and visitors, and are important to the sub-region's economic, environmental and social well-being. Water availability is also critical to the significant agricultural industries that exist within the sub-region. Surface water in the sub-region is an important resource, providing up to one-third of the metropolitan public water supply (approximately). Almost the entire

eastern half of the sub-region is reserved under the MRS or included in special control areas under the PRS to protect surface water catchments from inappropriate development. The framework includes some alterations to these Water Catchment Protection area boundaries that mainly reflect changes already formally proclaimed or abolished.

The Jandakot groundwater mound, located in the centre of the north portion of the sub-region, is a significant source of quality fresh water in the Perth region. To effectively manage this water source, there needs to be careful consideration of land uses that impact on the quantity and quality of water that enters the underground aquifer, and management of water abstraction is required. *State Planning Policy 2.3 Jandakot Groundwater Protection* guides land use change and development on the Jandakot mound to ensure it is compatible with the long-term use of the groundwater for public consumption.

The use of the sub-region's water resources for urban and rural purposes needs careful management to rationalise its use and reduce unnecessary consumption. In view of limited water availability, development and



management of public open space needs to be reviewed to consider the use of non-potable water supplies for irrigation purposes, and using materials and plants, as well as designing recreational spaces, which have a reduced water requirement.

A regional water management strategy, highlighting key water considerations, has been developed for the sub-region. This strategy will inform subsequent stages of water planning in the sub-region at the district and local levels, which will be undertaken in accordance with the WAPC's Better Urban Water Management framework.

Basic raw materials

Basic raw materials are a finite resource and access to basic raw materials with cost-effective proximity to future growth areas is important to housing affordability and moderating the cost of future infrastructure projects. During the preparation of the framework, efforts have been made to achieve a suitable outcome between development and areas identified for basic raw material extraction.

Land classified for development within the Latitude 32 industrial area, Baldvis cemetery site and Urban Deferred land at Karnup contains important basic raw materials. Planning for these areas will need to have regard for the principle of sequential land use and buffers

so that the regional value of these resources can be realised and materials are available as demand dictates, before any development occurs in these areas.

Key sources of basic raw materials within the sub-region are mainly located in Orange Grove–Martin, Cardup–Whitby, Hope Valley–Wattleup–Postans, Baldvis, Karnup and Lake Clifton. Land use proposals within the Pinjarra–Ravenswood sector will require access to the longer-term sand fill supplies that are expected to be available at Lake Clifton.

Plan 9 (page 57) includes geological information for basic raw materials. It does not infer support for extraction in any location. The basic raw material mapping is subject to ongoing refinement as part of the review of *State Planning Policy 2.4 Basic Raw Materials*, the Planning Frameworks and in conjunction with the Strategic Assessment of Perth and Peel regions.

Agricultural land

There is a variety of food-producing areas in the sub-region, including the coastal sandy soils used to grow seasonal vegetables in Kwinana, Cockburn, Rockingham and Serpentine–Jarrahdale, to the fruit growing in the Perth Hills in Armadale, Serpentine–Jarrahdale and Dwellingup. More than 3,000 hectares of land is used for intensive

agriculture in this sub-region but urban and industrial growth has already displaced most vegetable producing areas south of Perth.

With the need to accommodate a rapidly growing population, there is also an urgent need to preserve land for food production close to urban areas. To achieve this, priority agricultural land needs to be identified and protected, taking into account a range of issues, including the combination of soils, climate, water and access to services.

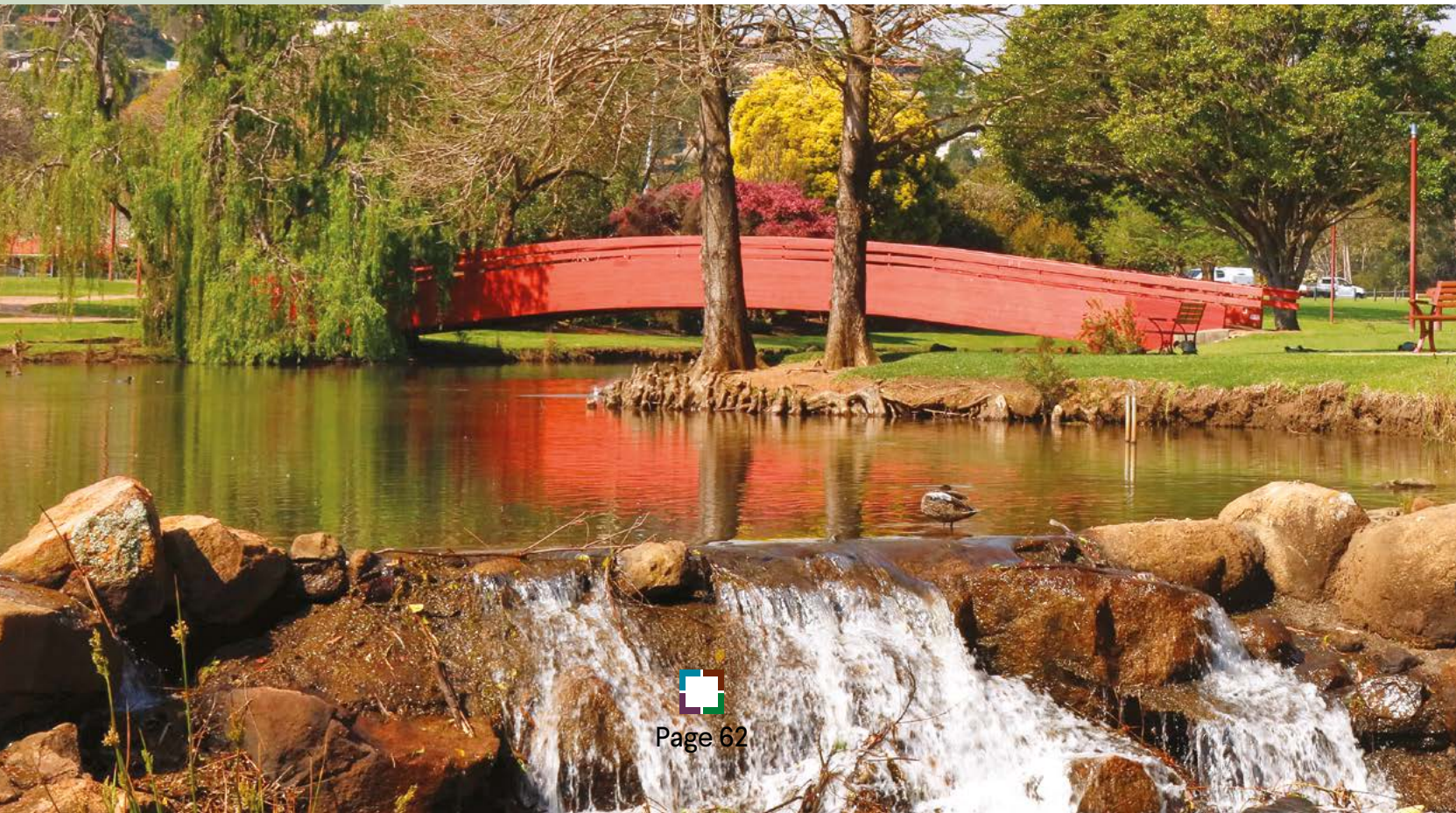
While Keralup (east) is classified as Rural, further investigation will be required to consider alternative future land uses. Such uses could include a combination of activities providing opportunities for recreation, environmental management, economic activity and/or agribusiness. There is potential for synergies with the Transform Peel initiative including the Peel Integrated Water Initiative and the Nambeelup industrial area, as the Peel Business Park and/or a broader agricultural precinct.

Within the Peel–Harvey and Swan–Canning catchment areas, there will also need to be increased use of innovative new technologies and/or closed system food production to minimise nutrient export.

In the interim there is a presumption against the development and/or subdivision of rural land which is inconsistent with *State Planning Policy 2.5 Rural Planning*.

IMPLEMENTATION

The framework is the first step in the ongoing process of refining and detailing planning proposals for the South Metropolitan Peel sub-region



Introduction

The framework will be incorporated into *State Planning Policy 1 State Planning Framework Policy* and will provide a long-term strategic plan for the sub-region.

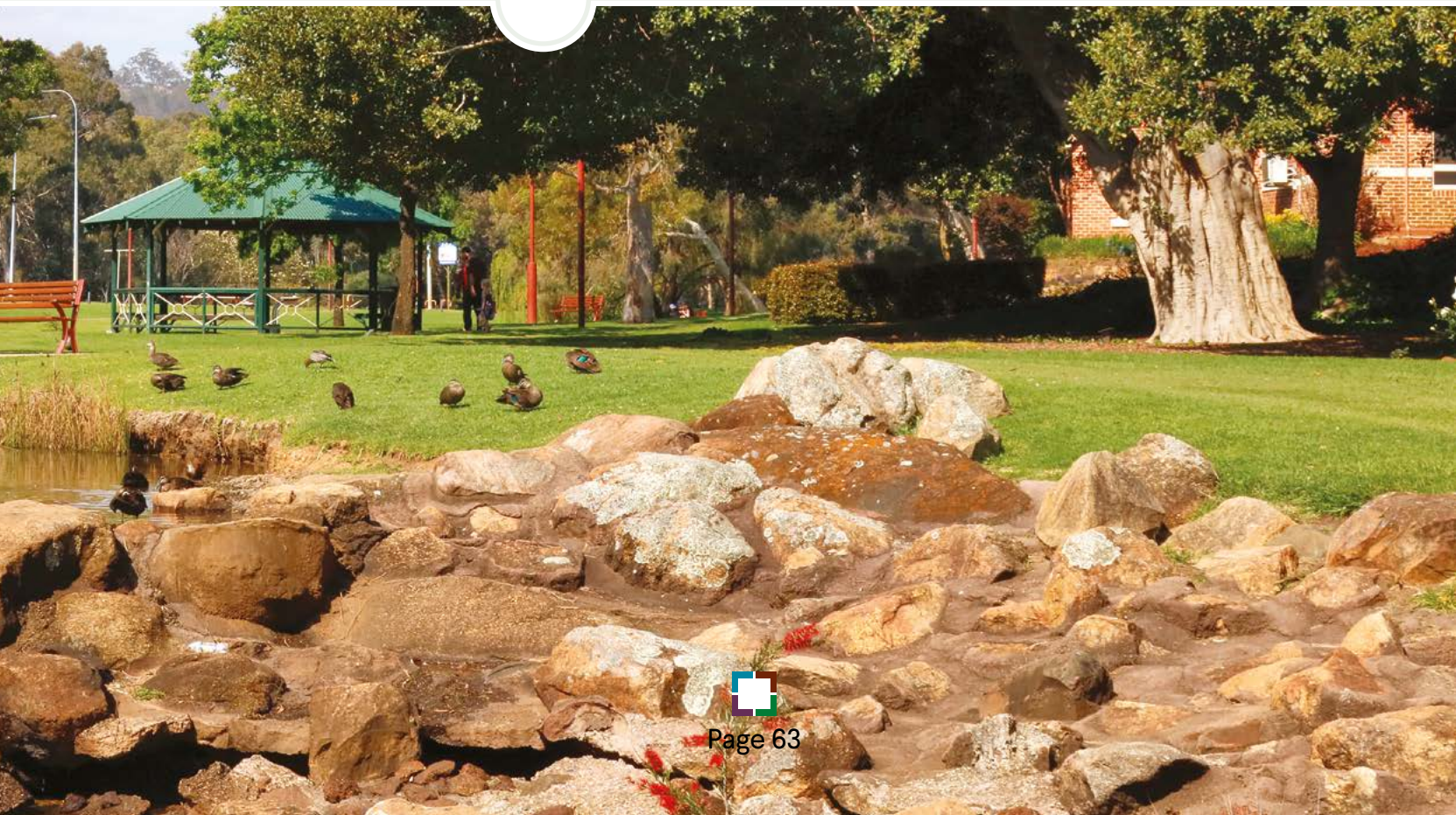
The framework identifies sufficient land for housing and employment to accommodate anticipated population growth, incorporating land use and infrastructure proposals to 2050 and broad principles to guide the future development of the sub-region. It will remain responsive to evolving community expectations while balancing compliance with the broad principles of urban consolidation and protection of the substantial environmental attributes within the sub-region.

4.1 Implementation mechanisms and actions

The framework is a strategic planning document and therefore does not change the existing zonings or reservations that have effect under statutory region and local planning schemes. Changes to zoning can only occur after an amendment to the relevant statutory region and local planning schemes. The framework is the first step in the ongoing process of refining and detailing planning proposals for an area. This refinement will continue through the MRS/PRS, local planning schemes, structure planning, subdivision and/or development.

The framework's foundation is a consolidated urban form with an integrated land use and movement network that maximises the use of existing infrastructure and avoids and protects regionally-significant environmental attributes where appropriate. It provides a high-level strategic context to guide future development and address key challenges for the sub-region.

The implementation of the framework will require close collaboration across State government agencies, local government and the private sector.



Specific implementation actions and the responsible authority for each are outlined in Table 8. In addition, detailed work programs will need to be established by relevant authorities to ensure the preparation or review of supporting planning instruments are aligned with the principles and objectives of the framework.



TABLE 8: Implementation actions

Consolidated urban form

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To create sustainable communities that are attractive places to live and work. The consolidation of urban areas will provide for the more efficient use of urban land and infrastructure with improved access to public transport, sport and recreation, community and commercial facilities while minimising impacts on significant environmental attributes.	Urban	Structure planning	WAPC Local government
	Urban deferred	Lifting of urban deferment in the region scheme	WAPC
		Structure planning	WAPC Local government
	Urban Expansion and Investigation areas	District structure plans (where appropriate), generally prior to region scheme zoning	WAPC Local government
		Relevant investigations (for investigation areas)	WAPC Various
		Region scheme amendments	WAPC
		Local planning strategy/scheme amendments	WAPC Local government
	Urban Expansion and Investigation areas to be based on 15 dwelling units per gross hectare of Urban zoned land	Local planning strategy/scheme amendments	WAPC Local government
		Structure planning	
	Planning Investigation areas	Undertake further planning investigations	WAPC, in consultation with relevant agencies Local government
	Establish minimum urban infill dwelling targets and identify sites consistent with the principles of urban consolidation	Local planning strategy/scheme amendments	WAPC Local government
		Structure planning	
Encourage the review of endorsed structure plans to achieve a minimum average density of 15 dwellings per gross urban hectare		Structure planning	Local government

TABLE 8: Implementation actions (continued)

Economy and employment

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To promote employment opportunities and increase the number of people who live and work within the sub-region, with a focus on attracting strategic economic and employment land uses within the strategic metropolitan centres and key industrial centres, while maximising use of existing and proposed infrastructure.	Promote employment nodes including activity centres, specialised centres, Industrial areas, Industrial Expansion areas and Industrial Investigation areas	Structure planning	WAPC Local government
		Relevant investigations (for investigation areas)	WAPC Various
		Region scheme amendments	WAPC
		Local Economic Development Strategy	Local government
		Local planning strategy/scheme amendments	WAPC Local government
	Protect employment land from uses inconsistent with the employment objective by planning for ultimate development with limited interim uses	Region scheme amendments	WAPC Local government
		Local planning strategy/scheme amendments	
		Structure planning	
	Protect strategic industries and land classified for this purpose, together with their buffers, from the encroachment of non-strategic and/or incompatible land uses	Region scheme amendments	WAPC Local government
		Local planning strategy/scheme amendments	
		Structure planning	
	Improve employment self-sufficiency to reach target	Structure planning	Local government

Community and social infrastructure

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To provide a wide range of community and social infrastructure to enhance the health and wellbeing of the community and meet the community's needs including health, education and sport and recreation, while promoting infrastructure co-location and optimising the use of existing facilities and infrastructure.	Provide land within the sub-region for sport and recreation, regional-level health facilities, education and cemeteries	Structure planning	Local government
		Region scheme amendments	WAPC
	Provide a site of 20ha for Open Space-Sport within the City of Cockburn	Undertake Investigations into Reserve 50591 in Coogee and land classified for Industrial Investigation in Munster, Beeliar and Wattleup	WAPC Local government

TABLE 8: Implementation actions (continued)

Movement and access

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To provide an efficient and effective regional movement network for people and freight that is integrated with land uses, links key economic and employment opportunities and connects the sub-region to the greater Perth and Peel regions as well as the south-west of the State and the Wheatbelt.	Undertake ongoing monitoring of the movement network, refine plans as appropriate and implement transportation upgrades/ construction to road, rail, public transport and active transport infrastructure	Ongoing monitoring and upgrade/construction as required	WAPC Department of Transport Main Roads Western Australia Public Transport Authority Local government
		Region scheme amendments	WAPC
		Local planning strategy/ scheme amendment	WAPC Local government
		Structure planning	WAPC Local government
	Investigate and confirm alignment for Southern Link Road (Mundijong Road to Albany Highway)	Undertake alignment selection investigations	Main Roads Western Australia Local government
	Ameliorate freight railway noise and severance impacts on Mundijong	Determine new alignment for Mundijong freight rail	WAPC Department of Transport Local government
	Investigate the opportunity to upgrade the Read Street-Warnbro Sound Avenue-Dampier Drive, from a high-frequency to high-priority transit corridor, in conjunction with potential additional urban infill opportunities along this key transport corridor	Undertake further investigations	Local government WAPC Department of Transport Public Transport Authority
	Confirm alignments for transit corridors, in conjunction with any central area transit services, for central Mandurah and approaches, including options for a bus layover facility in the Mandurah City Centre	Undertake further investigations	Department of Transport Public Transport Authority WAPC Local government

TABLE 8: Implementation actions (continued)

Movement and access

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
	Investigate and determine whether a refined approach to the provision of high frequency transit corridors, such as more widely spaced bus networks with more frequent services, is preferable in the Pinjarra-Ravenswood sector If a refined approach is preferable, secure agreement to a refined approach to public transport provision (also see Table 3)	Undertake further investigations	Local government WAPC Department of Transport Public Transport Authority
	Confirm alignment for extension of passenger rail network from Forrestfield Station to Thornlie line	Undertake further investigations	Department of Transport WAPC Public Transport Authority
	Confirm alignment for connection between Thornlie line and Fremantle	Undertake further investigations	Department of Transport WAPC Public Transport Authority
	Confirm alignment/s for additional southern rail line/Perth–Bunbury passenger rail line	Undertake further investigations	Department of Transport WAPC Public Transport Authority
	Make provision for transit corridors	Ensure planning for roads includes provision for transit corridors	WAPC Department of Transport Main Roads Western Australia Public Transport Authority Local government
	Facilitate shared infrastructure corridors to reduce land requirements	Region scheme amendment	WAPC Service Authorities Department of Transport
	Make provision for future Outer Harbour port facilities	Determine location and configuration of future Outer Harbour port facilities and related infrastructure requirements	Westport Taskforce
	Confirm land requirements for intermodal facility at Latitude 32	Further investigations as part of Port of Fremantle master planning process	Westport Taskforce

TABLE 8: Implementation actions (continued)

Movement and access

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
	Facilitate an intermodal facility in Mundijong	Consider as part of Westport Strategy	Department of Transport
	Identify an additional rail option for the Kwinana Industrial Area to deal with capacity limits at the Kwinana Triangle	Complete investigations	Department of Transport Department of Planning, Lands and Heritage
	Identify suitable locations for future general and civil aviation airports together with possible measures for new facilities should they be needed	Complete Future Perth Airports Technical Study	WAPC Department of Transport

Service infrastructure

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To ensure the timely, efficient and cost-effective delivery of electricity, water, wastewater and other service infrastructure that is aligned with the staging of development and encourage the shared use of infrastructure corridors by the various service providers.	Complete an infrastructure capacity report to accompany urban infill strategies urban infill strategies	Structure planning	WAPC Local government
		Local planning strategy/scheme amendment	Local government
	Optimise use of existing infrastructure, with urban infill and employment opportunities utilising the principles of urban consolidation	Structure planning	WAPC Local government
		Region scheme amendment Local planning strategy/scheme amendment	
	Facilitate shared infrastructure corridors	Region scheme amendments	WAPC Service providers
		Structure planning	Department of Transport Local government
	Identify and/or protect sites for regional service infrastructure provision	Region scheme amendment	WAPC Service providers
		Structure planning	Department of Transport Local government

TABLE 8: Implementation actions (continued)

Environment and landscape

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To preserve and enhance the environmental and landscape values of the sub-region for future generations to enjoy.	Identify and protect ecological linkages, where appropriate	Structure planning	Local government WAPC Department of Biodiversity Conservation and Attractions
	Design district and local open space to utilise green network principles	Local planning strategy/ scheme amendment	WAPC Local government
	Open Space Investigation areas	Relevant planning and/ or environmental investigations	WAPC Various
	Protect land for additional parks and recreation / regional open space purposes	Region scheme amendment	WAPC
	Undertake various environmental studies including landscape assessment, karst management plan, coastal planning/sea level rise to support proposals	Structure planning	WAPC Department of Water and Environmental Regulation
		Local planning strategy/ scheme amendment	Local government



TABLE 8: Implementation actions (continued)

Natural resources

Sub-regional planning framework objective	Strategic direction/priority	Actions	By whom
To manage the availability and use of natural resources to ensure existing and potential land uses can be balanced against broader environmental outcomes.	Identify the impact of proposals within public drinking water source areas or within the <i>State Planning Policy 2.3 Jandakot Groundwater Protection</i> area	Region scheme amendments	WAPC, upon advice of Department of Water and Environmental Regulation
	Identify and protect priority agricultural land	Local planning strategy/scheme amendment	WAPC Department of Primary Industries and Regional Development Local government
	Determine the more-detailed staging and sequencing for development sites with basic raw materials, within the framework provided by Plan 10	Structure planning	WAPC Local government
		Local planning strategy/scheme amendment	
	Prepare and implement water management strategies in accordance with the South Metropolitan Peel Regional Water Management Strategy and <i>Better Urban Water Management</i> framework	District, local and urban water management strategies	WAPC Department of Water and Environmental Regulation Local government
	Retain, consolidate and rehabilitate vegetation and habitat as required	Rehabilitation/vegetation management plan	Local government Department of Water and Environmental Regulation Department of Mines, Industry Regulation and Safety

Notes:

1. Strategic directions/priorities are uncommitted projects and a range of issues will require further consideration over time, including further detailed planning, timing and funding. The provision of funding will be a future decision of the State and relevant local governments.
2. Initiatives other than those specified in Table 8 may be required.
3. The type of structure plan (i.e. district, local or activity centre) will depend upon the statutory framework and be subject to further discussion with the Department of Planning, Lands and Heritage and relevant local government.
4. Table 8 refers to State and local government actions only.



4.2 Staging and sequencing

Timing for the delivery of proposals listed in the framework will be guided by a number of factors including demand for urban land, landowner intentions, the capacity of servicing agencies and local government planning within the sub-region.

Based on average consumption rates for urban land within the sub-region there is sufficient undeveloped land classified Urban and Urban Deferred, as well as Urban Expansion, Urban Investigation and potentially some of the identified Planning Investigation areas available to meet forecast housing requirements for about 30 years in the south-western sector, 50 years in the south-eastern sector and 50 years in the Peel sector. The framework also identifies sufficient land (17,420 hectares) to accommodate projected population growth to 2050.

The framework provides a broad guide for the staging of urban development based on the timeframes provided in Table 9 and shown on Plan 10. Anticipated timeframes for the delivery of required infrastructure to service future urban and industrial development is also outlined in Plan 11 and Table 10. Developers and local government will need to liaise with relevant authorities at more detailed planning stages in relation to these infrastructure requirements.

TABLE 9: Anticipated staging and average urban land demand

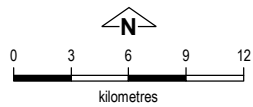
Staging	Timeframe*	Urban land demand**
Short-term	up to 2021	3,220 hectares
Medium-term	2022–31	4,600 hectares
Long-term	2032–50	8,740 hectares
	2015–50	Total: 16,560 hectares

Source: WAPC, 2016

* Urban land demand calculated for the period 2015–50

** Urban land demand based on average consumption of 230ha per year





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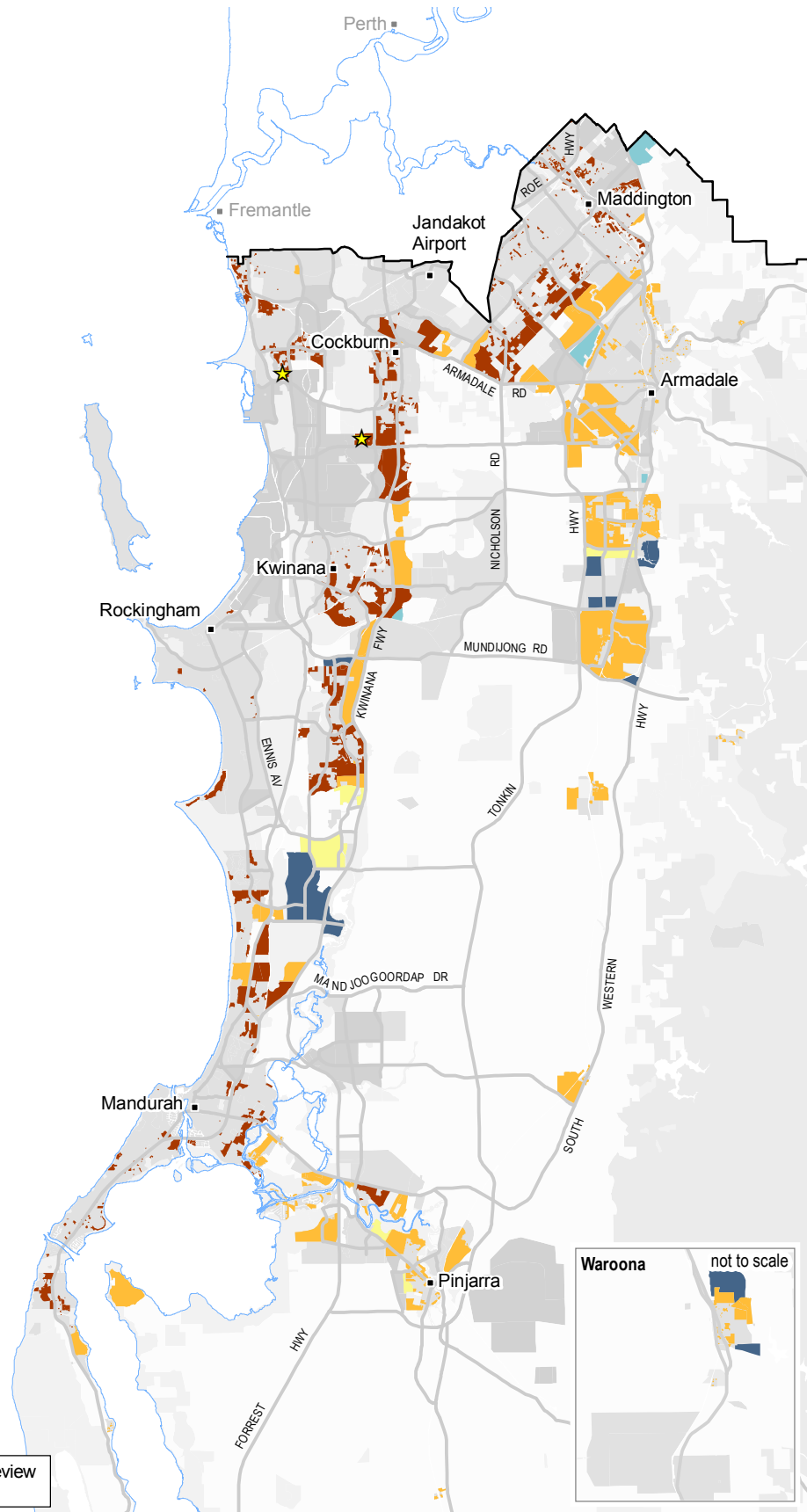
Base information supplied by
Western Australian Land Information Authority
SLIP 944-2017-1

Legend

Staging

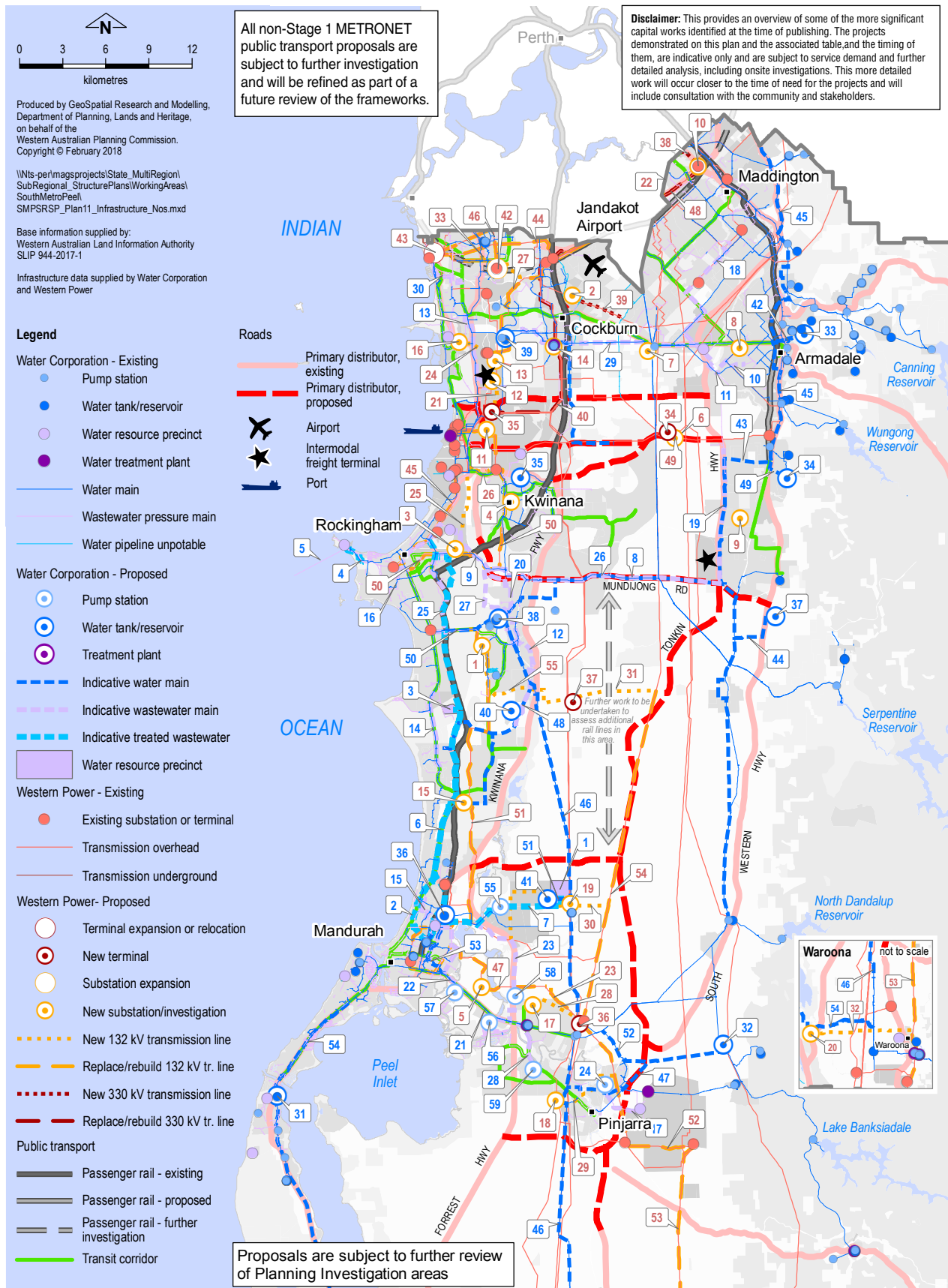
- Short term
(2015-2021)
- Short-medium term
(2015-2031)
- Medium term
(2022-2031)
- Medium-long term
(2022+)
- Long term
(Beyond 2031)

- ★ Subject to a review of
Kwinana Industrial
(including Air Quality) Buffer



Proposals are subject to further review
of Planning Investigation areas

PLAN 10: Urban staging



PLAN 11: Infrastructure staging



Development within the sub-region will need to be undertaken in a sequential manner as logical extensions to existing development fronts to ensure that an adequate supply of land will be continuously available. The timeframes depicted on the urban staging plan (Plan 10) set out the anticipated timing for commencement of development, aligned with planned service provision and should not be construed as preventing further detailed planning from occurring in the interim. It is expected that local planning strategies will be consistent with these timeframes.

The following criteria need to be addressed, as they apply to a proposal, in order to obtain support from the WAPC for any proposal that is not sequential and/or is inconsistent with the timeframe depicted in the staging plan.

- The proposal represents a logical expansion and consolidation of the existing developed urban form.
- The proposal is compatible with the economic development of the area and the planned provision of employment opportunities for the projected population within the sub-region.
- The development can be readily accessed without the provision of additional transport infrastructure, unless that infrastructure is already funded.
- The proposal will not detrimentally impact upon the staging timeframes of other urban land, in terms of the ability to service other land.
- Agreed and finalised funding arrangements are in place with essential service providers, acknowledging that funding is the responsibility of the landowner, unless provided for in a current capital works program of the relevant servicing authority.
- Servicing can be economically provided over its lifespan.

TABLE 10: Infrastructure staging

South Metropolitan Peel

Short-term (2015 - 2021)	Water and wastewater	
	6	Gordon Road Wastewater Treatment Plant Effluent Pipeline
	4	SDOOL Duplication (Staged)
	10	Armadale Main Sewer
	11	Armadale Wastewater Pump Station, Pressure Main and Gravity Sewers (staged)
	14	Peelhurst Wastewater Pressure Main Duplication
	15	North Mandurah Pebble Beach Waste Water Pump Station to Gordon Road Wastewater Treatment Plant Wastewater Pressure Main Duplication
	31	Caddadup Tank
	32	Pinjarra (Morrell Road) Tank land acquisition
	23	West Murray, Barragup and West Pinjarra to Gordon Road Waste Water Treatment Plant Wastewater Pressure Mains corridor land acquisitions
Road networks		
		Murdoch Activity Centre Southern Access



TABLE 10: Infrastructure staging (continued)

Medium-term (2022 - 2031)	Electricity supply	
	1	New 132kV Infrastructure Substation Baldivis
	2	New 132kV Infrastructure Substation Jandakot Airport
	3	New 132kV Infrastructure Substation East Rockingham
	4	New 132kV Infrastructure Substation Parmelia
	5	New 132kV Infrastructure Substation Furnissdale
	21	New 132 kV Infrastructure Line Route Kwinana to Latitude 32 No.2
	22	New 132 kV Infrastructure Line Route Southern Terminal to Byford / Southern River
	23	New 132kV Infrastructure Line Route Mandurah to Furnissdale to Pinjarra
	38	New 330kV Infrastructure Line Route Cannington to Kenwick Link
	39	New 330kV Infrastructure Line Route Guildford to Southern
	40	New 330 kV Infrastructure Line Route Cannington to Guildford to Southern Line
	42	Upgrade 132kV Infrastructure Substation Australian Paper Mills
	43	Upgrade 132kV Infrastructure Substation South Fremantle
	44	Upgrade 132kV Infrastructure Line Route South Fremantle to Southern
	45	Upgrade 132kV Infrastructure Line Route Mason Road to Rockingham
	46	Upgrade 132kV Infrastructure Line Route South Fremantle to O'Connor to Myaree to Australian Paper Mills to South Fremantle
	47	Upgrade 132kV Infrastructure Line Route Mandurah to Furnissdale to Pinjarra
	48	Upgrade 330kV Infrastructure Line Route Southern to Kenwick Link
	Water and wastewater	
	4	SDOOL Duplication (Staged)
	7	Nambeelup Wastewater / Effluent Transfer Main
	8	Byford Wastewater Pressure Main to East Rockingham Wastewater Treatment Plant (staged)
	9	Baldivis to East Rockingham Wastewater Treatment Plant Gravity Sewer
	12	Baldivis Main Sewer (staged)
	13	Wattleup Main Sewer
	16	Rockingham Wastewater Pressure Main
	17	Pinjarra Forrest Street Waste Water Pump Station to Pinjarra Waste Water Treatment Plant Pressure Main
	18	Walter St Pressure Main Duplication
	19	Hopkinson Road Wastewater Pressure Main
	20	Baldivis North Wastewater Pressure Main
	21	Barragup East Wastewater Pressure Main
	22	Barragup West Wastewater Pressure Main
	23	West Murray, Barragup and West Pinjarra to Gordon Road Waste Water Treatment Plant Wastewater Pressure Mains (staged)
	24	Pinjarra Forrest Street Wastewater Pump Station upgrade and Pressure Main
	33	Armadale-Kelmscott (Canns Road) Tank and outlet
	34	Byford Tank and outlet
	35	Medina Tank/s (ground and HL) staged
	36	North Mandurah Tank duplication
	42	Armadale- Kelmscott (Canns Road)Trunk and Distribution Mains

TABLE 10: Infrastructure staging (continued)

Medium-term (2022 - 2031)	Water and wastewater (continued)	
	47	Pinjarra (Morrell Road) Distribution Mains (staged)
	48	Karnup Water Distribution Mains (staged)
	49	Byford Distribution Main
	50	Tamworth Hill to Safety Bay Road Distribution Main Upgrade
	51	Nambeelup Distribution Mains (staged)
	52	Pinjarra Distribution Mains
	55	Keralup South (Nambelup) Main Wastewater Pump Station
	56	Barragup Wastewater Pump Station
	57	Barragup West Wastewater Pump Station
	Road network	
		Tonkin Highway: extend to Forrest Highway, Pinjarra (partial)
		Fremantle-Rockingham Highway: extend to Kwinana Freeway at Mundijong Road (staged)
	Freight	
		Duplicate single-track sections in Forrestfield/Kewdale Freight Rail
		Identify an additional rail option for the Kwinana Industrial Area to deal with capacity limits at the Kwinana Triangle
	Public transport	
		Extension of the passenger rail network Armadale – Byford
		Byford Station
		Extension of the passenger rail network Thornlie – Cockburn
		Nicholson Road Station
		Ranford Road Station
		Karnup Station
		High Priority Transit Corridor – Fremantle-Cockburn Coast-Kwinana-Rockingham
		High Priority Transit Corridor – Fremantle-Cockburn Central-Armadale
		High Priority Transit Corridor – Baldivis-Warnbro
		High Priority Transit Corridor – Mandurah-Ravenswood-Pinjarra
	Cycling network	
		Expand off-road network within Perth and Peel regions

TABLE 10: Infrastructure staging (continued)

	Electricity supply	
Long-term (2031 - 2050)	6	New 132kV Infrastructure Substation Oakford/Oldbury
	7	New 132kV Infrastructure Substation Forrestdale
	8	New 132kV Infrastructure Substation Armadale (Champion Lakes)
	9	New 132kV Infrastructure Substation Cardup
	10	New 132kV Infrastructure Substation Thornlie
	11	New 132kV Infrastructure Substation Latitude 32 (Hope Valley - Wattleup) No.1
	12	New 132kV Infrastructure Substation Latitude 32 (Hope Valley - Wattleup) No.2
	13	New 132kV Infrastructure Substation Latitude 32 (Hope Valley - Wattleup) No.3
	14	New 132kV Infrastructure Substation Success
	15	New 132kV Infrastructure Substation Golden Bay
	16	New 132kV Infrastructure Substation Henderson
	17	New 132kV Infrastructure Substation Ravenswood
	18	New 132kV Infrastructure Substation West Pinjarra
	19	New 132kV Infrastructure Substation Nambeelup
	20	New 132kV Infrastructure Substation Lake Clifton
	24	New 132kV Infrastructure Line Route Henderson to Cockburn Cement
	25	New 132kV Infrastructure Line Route Medina to East Rockingham
	26	New 132kV Infrastructure Line Route Medina to Kwinana to Mason Road Line
	27	New 132kV Infrastructure Line Route Southern to Cockburn
	28	New 132kV Infrastructure Line Route Ravenswood to Pinjarra
	29	New 132kV Infrastructure Line Route West Pinjarra to Alcoa Pinjarra/Pinjarra Line
	30	New 132kV Infrastructure Line Route Cannington/Meadow Springs/Pinjarra Line to Nambeelup
	31	New 132kV Infrastructure Line Route Hopeland to Cannington/Meadow Springs/Pinjarra Line
	32	New 132kV Infrastructure Line Route Lake Clifton to Alcoa/Pinjarra/Wagerup
	33	New 132kV Infrastructure Line Route Southern to South Fremantle to Southern to Cockburn Cement
	34	New 330kV Infrastructure Terminal South East
	35	New 330kV Infrastructure Terminal Kwinana
	36	New 330kV Infrastructure Terminal Pinjarra
	37	New 330kV Infrastructure Terminal Hopeland
	41	New 330kV Infrastructure Line Route Southern to Kwinana
	49	Upgrade 132kV Infrastructure Line Route South East to Oakford
	50	Upgrade 132kV Infrastructure Line Route Kwinana to Rockingham
	51	Upgrade 132kV Infrastructure Line Route Waikiki to Mandurah
	52	Upgrade 132kV Infrastructure Line Route Alcoa Pinjarra to Pinjarra
	53	Upgrade 132kV Infrastructure Line Route Alcoa Pinjarra to Wagerup
	54	Upgrade 132kV Infrastructure Line Route Cannington to Meadow Springs to Pinjarra
	55	Upgrade 132kV Infrastructure Line Route Baldivis to Hopeland

TABLE 10: Infrastructure staging (continued)

Long-term (2031 - 2050)	Water and wastewater	
	1	Nambeelup Treatment/Treated Wastewater Reuse/Water Resource Plant
	2	Gordon Road Wastewater Treatment Plant Effluent Pipeline to Port Kennedy
	3	Port Kennedy potential Treatment Plant/Treated Wastewater Reuse/Water Resource Plant Cape
	5	Peron Ocean Outfall Section Duplication
	12	Baldivis Main Sewer (staged)
	23	West Murray, Barragup and West Pinjarra to Gordon Road Wastewater Treatment Plant Wastewater Pressure Mains (staged)
	25	Warnbro Waste Water Pressure Main
	26	Byford Wastewater Pressure Main to Wastewater Treatment Plant (staged)
	27	Baldivis South Wastewater Pressure Main
	28	West Pinjarra Wastewater Pressure Main
	29	Waterworks Pressure Main Duplication
	30	Fremantle SD Main Wastewater Pump Station (Bennett Street) Pressure Main Duplication/Upgrade
	37	Mundijong Reservoir
	38	Tamworth Hill Reservoir duplication
	39	Thompsons Reservoir No 2
	40	Karnup Tank (staged)
	41	Nambeelup Tank
	34	Byford Second Tank
	43	Serpentine-Wungong Trunk Main
	44	Mundijong to Tamworth Hill Trunk Main
	45	Wungong Trunk Main
	46	Stirling Trunk Main upgrade/duplication
	53	North Mandurah Water Distribution Mains
	48	Karnup Water Distribution Mains (staged)
	54	Caddadup Water Distribution Main
	47	Pinjarra (Morrell Road) Distribution Mains (staged)
	58	West Murray Wastewater Pump Station
	59	West Pinjarra Wastewater Pump Station
	Road network	
		Fremantle-Rockingham Highway: upgrade to freeway standard between Leach Highway and Kwinana Freeway at Mundijong Road (staged)
		Tonkin Highway south upgrade to freeway standard to Mundijong Road (staged)
		Tonkin Highway: extend to Forrest Highway, Pinjarra
		Mandjoogoordap Drive extend between Kwinana Freeway and Tonkin Highway
		South Western Highway Deviation (Waroona)

TABLE 10: Infrastructure staging (continued)

Long-term (2031 - 2050)	Freight	
		Rowley Road, Anketell Road and Mundijong Road: construct to 4 lane divided standard freight route, linking Tonkin Highway, Kwinana Freeway and the Fremantle-Rockingham Highway with the Western Trade Coast, including the future container port facility in the Outer Harbour Provide transfer systems to support future container port facilities in the Outer Harbour Duplicate freight rail track between Cockburn Triangle and Latitude 32 Industry Zone, and between Latitude 32 and the Kwinana Triangle Mundijong Intermodal Terminal
	Public transport	
		Further investigation – better integration of the Australind service with the metropolitan passenger rail service between Perth and Mundijong to improve operational efficiency Further Investigation – extension of the passenger rail network Forrestfield Station to connect with the Thornlie line Further Investigation – extension of the passenger rail network to connect the Thornlie line to Fremantle
	Cycling network	
		Expand off-road network within Perth and Peel regions
Beyond 2050	Road network	
		Tonkin Highway south upgrade to Freeway standard between Mundijong Road and Forrest Highway (staged) Mundijong Road upgrade to freeway standard between Kwinana Freeway to Tonkin Highway Southern Link Road South Western Highway: realign south of Pinjarra
	Public transport	
		Further Investigation – additional southern metropolitan rail line as well as possible further high speed extension to Bunbury

Notes:

1. Subject to further review of Planning Investigation areas.
2. The projected timing of transport infrastructure will be subject to population growth rates. The relationship between projected timing and population is as follows:
 - 2031 – 2.9 million people
 - 2050 – 3.5 million people
3. Infrastructure item reference numbers correspond to infrastructure proposals in Plan 11.
4. Table 10 provides an overview of the more significant capital works identified at the time of publishing. The projects and their timing are indicative and subject to service demand and further detailed analysis.
5. All non-Stage 1 METRONET public transport proposals are subject to further investigation and will be refined as part of a future review of the Frameworks.
6. Traditional electricity infrastructure may be complemented by more innovative electricity supply models such as microgrids, embedded renewable energy generation and energy storage systems.
7. Many items listed are yet to be subject to financial analysis and business case development as part of the annual Budget process.



4.3 Infrastructure coordination

Fundamental to the delivery of land for development within the sub-region is the need for the coordinated and planned provision of infrastructure. Improvements to the coordination of infrastructure delivery are reflected by the recently developed Infrastructure Coordination Framework (ICF) administered through the WAPC's Infrastructure Coordinating Committee (ICC).

The ICF has been developed to assist the ICC to bring about greater alignment of strategic land use and infrastructure plans. This mechanism will encourage collaboration among infrastructure agencies and result in greater coordination outcomes including asset colocation opportunities, synergies, and economies of scale.

The ongoing monitoring of land supply and infrastructure provision, including review of the anticipated timing for infrastructure delivery (as specified in Plan 11 and Table 10 of the framework) will ensure that land use and infrastructure data remains current and responsive to urban and employment land consumption.

Identification of infrastructure supply opportunities which provide the basis for improved demand forecasting and network optimisation will facilitate greater responsiveness and adaptability to changing population and demographic and social trends, with a focus on the development and application of new technologies and innovation.

Concurrent with these initiatives, the State Government has committed to establishing Infrastructure WA to focus on strategic infrastructure planning, which will provide advice to Government in the form of a 20 year infrastructure strategy that will set out infrastructure priorities that will guide State Government decision-making.

4.4 Monitoring and review

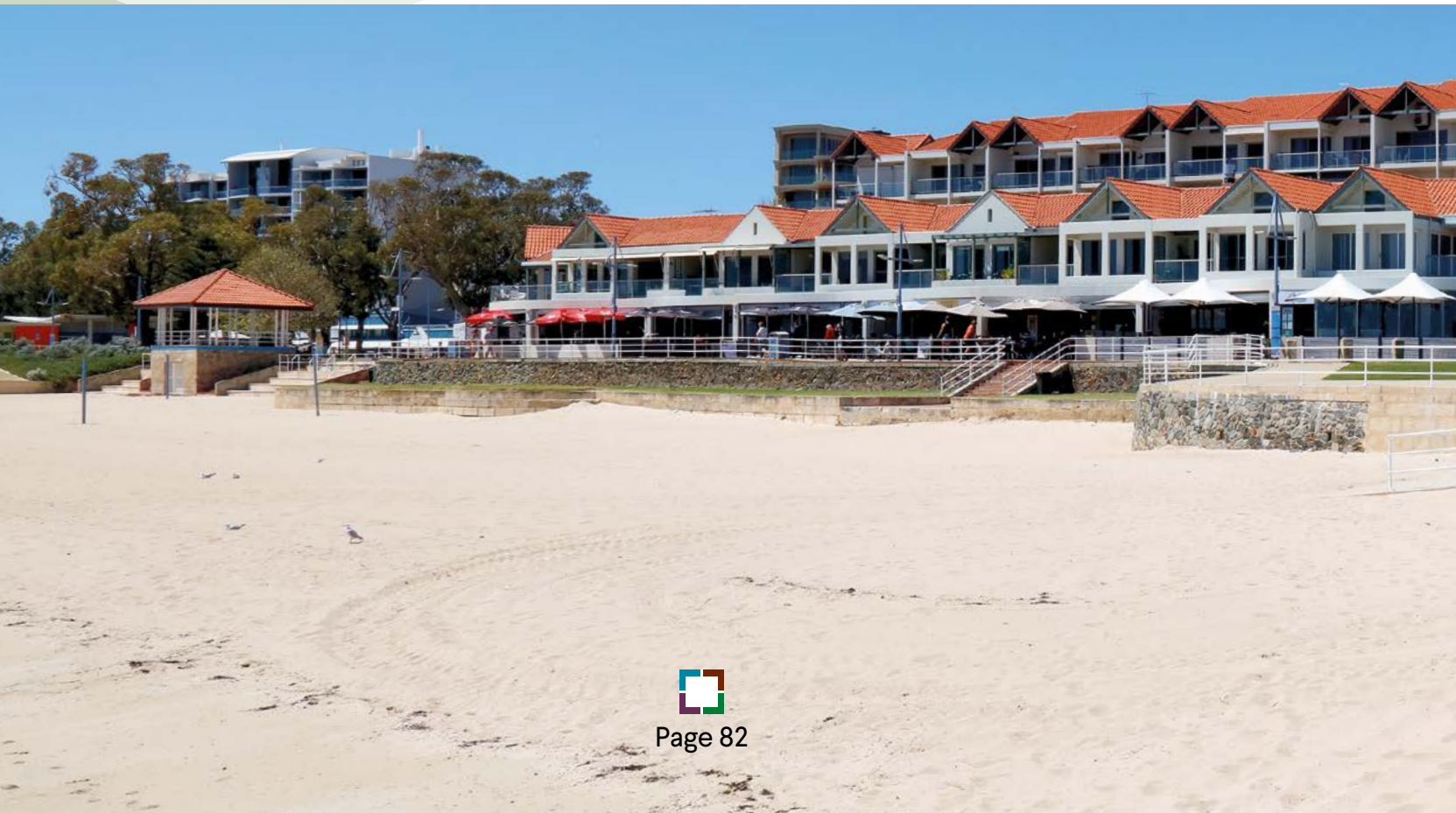
The framework will be reviewed after three years to ensure that it remains responsive to changes, challenges and community expectations, as the sub-region develops.

The delivery of additional infill housing opportunities associated with METRONET services that are currently being developed may lead to the need to revise infill targets and/or the staging of greenfield development through the review process.

Monitoring and reporting on progress towards delivering the framework will inform government, industry and the wider community about the progress of delivering the framework. It will be integral to the practice of evidence-based policy interventions that can respond to the challenges of a rapidly changing and growing city.



GLOSSARY, REFERENCES AND APPENDICES



Glossary

Activity centres: are community focal hubs. They comprise uses such as commercial, retail, higher-density housing, entertainment, tourism, civic/community, higher education and medical services. Activity centres vary in size and diversity and are designed to be well-served by public transport.

Affordable housing: refers to dwellings that households on low-to-moderate incomes can afford, while meeting other essential living costs. Affordable housing includes public housing, not-for-profit housing and other subsidised

housing under the National Rental Affordability Scheme, together with private rental and home ownership options for those immediately outside the subsidised social housing system.

Affordable living: recognises that direct rental or mortgage payments are not the only costs that households incur. Other expenses include the consumption of water, gas and electricity, property fees and taxes, the cost of transport (to work, education and shopping) and the price of food.

Agglomeration: is the phenomenon whereby businesses become more productive through proximity to other businesses. This occurs in a number of ways, for example when a small number of shops or restaurants cluster in a neighbourhood, or when businesses in similar industries cluster together such as with the information technology industry in Silicon Valley. Agglomeration economies come from the local density and diversity of businesses, workers and residents and exist whenever people become more productive through proximity to others.



Basic raw materials: are material that consists of sand (including silica sand), clay, hard rock limestone (including metallurgical limestone), gravel and other construction and road-building materials.

Bush Forever: is the State Government's strategic plan to protect sites of regionally-significant bushland within the Swan Coastal Plain portion of the Perth metropolitan region.

Dwelling: is a self-contained suite of rooms, including cooking and bathing facilities, intended for long-term residential use. Units (whether self-contained or not) within buildings offering institutional care (such as hospitals) or temporary accommodation (such as motels, hostels and holiday apartments) are not defined as dwellings.

Emerging activity centres: are centres as identified within *State Planning Policy 4.2 Activity Centres for Perth and Peel*, which includes centres which have been identified and/or approved, but have not yet become established.

Employment density: is the total employment of a selected geography divided by the total size of the selected geography (gross land area in hectares).

Employment self-sufficiency: is the ratio (expressed as a percentage) of the total labour force (local residents who are employed or seeking employment) of a defined area relative to the total number of jobs available in that area. A percentage above 100 indicates a region has more jobs locally than resident workers.

Green network: consists of public and private open spaces. The green network includes Bush Forever sites, national and regional parks, district and local parks, sports fields, school grounds, community facilities, golf courses, foreshores and beachfront areas connected by streetscapes, trails, cycle paths and pedestrian footpaths.

High Frequency Transit Corridor: where public transport services are available at a frequency of five minutes in peak times and 15 minutes out of peak times.

High Priority Transit Corridor: where high frequency public transport is facilitated through the use of traffic signalling priority, queue jumps at traffic lights or dedicated lanes.

Industrial: is land identified for industrial use, to provide for manufacturing industry, the storage and distribution of goods and associated uses.

Industrial Expansion: is land identified for future industrial development.

Industrial Investigation: is land that may be suitable for industrial development, but requires further investigation to determine its suitability and/or refinement of the area available for industrial use.

Infill or urban infill: is the redevelopment of existing urban areas at a higher density than currently exists.

Infrastructure Coordination Framework: a dynamic spatial and reporting tool assisting the Infrastructure Coordinating Committee to facilitate greater alignment of strategic land use and infrastructure plans through a revised Infrastructure Planning Cycle for Government.

Knowledge-based economy: is any economy based on creating, evaluating and trading knowledge. It describes a trend in advanced economies towards a greater dependence on knowledge, information and high skill levels.

Knowledge-based industries: are those industries that are in the business of the production, distribution and use of knowledge and information.

Labour force: is the total number of local residents who are participating in the labour force (i.e. those employed plus those seeking work).

Liveable Neighbourhoods: is a Western Australian Planning Commission operational policy that guides the structure planning and subdivision for new urban areas (greenfield) and urban infill sites.

Liveability: encompasses the many characteristics that make a place desirable for people to live.

Local planning strategy: is a local-level planning framework that provides strategic direction for land use and development in a local government area and is used to guide or inform the content of statutory local planning schemes.

Local planning schemes: are statutory planning schemes developed by local governments to regulate land use planning at a local scale. Land uses within a local planning scheme are required to be consistent with broad land uses assigned under the relevant region scheme.

Natural resources: are naturally-occurring elements such as water, solar, wind and wave energy, wood, coal and other minerals and fertile land.

New activity centres: are proposed centres, not identified within *State Planning Policy 4.2 Activity Centres for Perth and Peel*, necessary to ensure that new urban areas have access to services in close proximity to where people live.

New urban areas (greenfield areas): undeveloped land that has been identified for future urban use as an Urban Expansion or Urban Investigation area.

Open Space Investigation: is land that may be suitable for open space (nature/passive recreation) purposes but requires further investigation to determine its suitability and/or refine its area.

Population-driven employment: is employment associated with a growing residential population.

Planning Investigation: is land that will be subject to further planning investigation/s to consider its suitability, and the area of land to be identified, for a possible change of use.

Priority agricultural land: land of State, regional or local significance for food production purposes, due to its collaborative advantage in terms of soils, climate, water (rain or irrigation) and access to services.

Private self-supply (water): water use for private non-potable purposes such as public open space, industry and agriculture. Historically sourced from groundwater.

Public drinking water source area: the area from which water is captured to supply drinking water. It includes all underground water pollution control areas, catchment areas and water reserves constituted under the *Metropolitan Water Supply Sewerage and Drainage Act 1909* or the *Country Areas Water Supply Act 1947*.

Quality of life: is used to describe the general wellbeing of individuals and societies.

Recreation spaces: provide a setting for informal play and physical activity, relaxation and social interaction.

Region Planning Schemes: are the statutory regional planning schemes for the Perth and Peel regions (*Metropolitan Region Scheme* and *Peel Region Scheme*) and are the principal statutory mechanisms for the implementation of strategic land use and infrastructure proposals. These schemes provide for the acquisition of land (and waterways) where reserved for public purposes including regional open space, public uses and infrastructure.

Residential density targets: were established in *Directions 2031 and Beyond* and require new areas and structure plans under review to adhere to a target of 15 dwelling units per gross hectare of Urban zoned land, therefore excluding land comprised within all other zones and reserves under the applicable region scheme. Also refer to residential site density.

Residential site density: a residential density target needs to be translated into residential site density of 26 dwellings per residential site hectare. This is defined as the number of dwellings on land that is zoned residential under local planning schemes or structure plans, and excludes all non-urban regional reservations in the region schemes and non-residential zones in local planning schemes such as local road reserves, local reserves for sport and recreation, primary schools, commercial/ activity centres and offices. Also refer to residential density targets.

Rural living: an umbrella term used to describe a range of zones that provide for low density residential uses in an estate or precinct, generally characterised by a grouping of lots in the order of one to 40 hectares. Rural living zones include those named rural living, rural retreat, rural residential, special rural, rural smallholdings,

rural conservation and landscape protection. Although primary production land uses may occur within some rural living zones, they must be incidental to and compatible with the primary rural living intent and purpose of the zone.

Rural Residential: a sub-set of rural living and a land use zone with land parcels from one to four hectares in size.

Sense of place: is a component of 'cultural identity'; sense of place is a personal response to environmental, social and economic surroundings that an individual experiences in daily life. It can be the individual's or communities' perception and feeling of belonging for a home, local area, region, state or country.

Spatial plan: land use and infrastructure plan for Perth and Peel (Figure 4).

Special Residential: a residential land use zone with land parcels from 2,000m² to one hectare in size.

Sports spaces: provide a setting for formal structured sporting activities.

State forest: is a predominantly woodland area located on Crown land that may provide for conservation, recreation, water protection, timber production or extraction of basic raw materials.

Strategic economy and employment: is associated with the production and transfer of goods, services and knowledge predominantly to serve markets beyond the immediate location or catchment. Also known as 'traded clusters', as distinct from 'local clusters', which comprise industries that serve local population and business driven demand.

Strategic industrial areas: Areas zoned or planned for strategic industry, identified by the Department of State Development. Strategic Industrial Areas are planned industrial sites of significant economic and strategic importance to the State which provide buffered industrial land in strategic locations for the development of resource and export oriented industries, major utilities infrastructure and other strategic industries which may generate off-site impacts. Strategic Industrial Areas are formally recognised in planning schemes where they comprise an industrial core zoned as 'Strategic Industry' or similar and an appropriate statutory buffer.

Structure plan: a plan for the coordination of future subdivision and zoning of an area of land.



Sustainability: is meeting the needs of current and future generations through the integration of environmental protection, social advancement and economic prosperity.

Total dwellings: occupied and unoccupied dwellings.

Transit-oriented development: is an urban development around public transport stations that increases use of public transport. The aim is to locate moderate-to-high intensity commercial, mixed-use, community and residential development close to train stations and/or transit corridors to encourage public transport use over private vehicles.

Urban: land identified for urban use (Urban or Urban Deferred zoned land in the *Metropolitan Region Scheme*), such as residential and associated activity and bulky goods/light industry employment centres, recreation and open space.

Urban consolidation: includes infill and greenfield development through increased densities and/or the logical extension or 'rounding off' of existing urban and industrial areas to more-effectively utilise existing social, service and transport infrastructure.

Urban Expansion: is land that has been identified for future urban development.

Urban Investigation: is land that may be suitable for urban development, but requires further investigation to determine its suitability and/or refine the area available for urban use.

Water resource precinct: is an infrastructure site identified by the Water Corporation for the provision of water and wastewater-related services.

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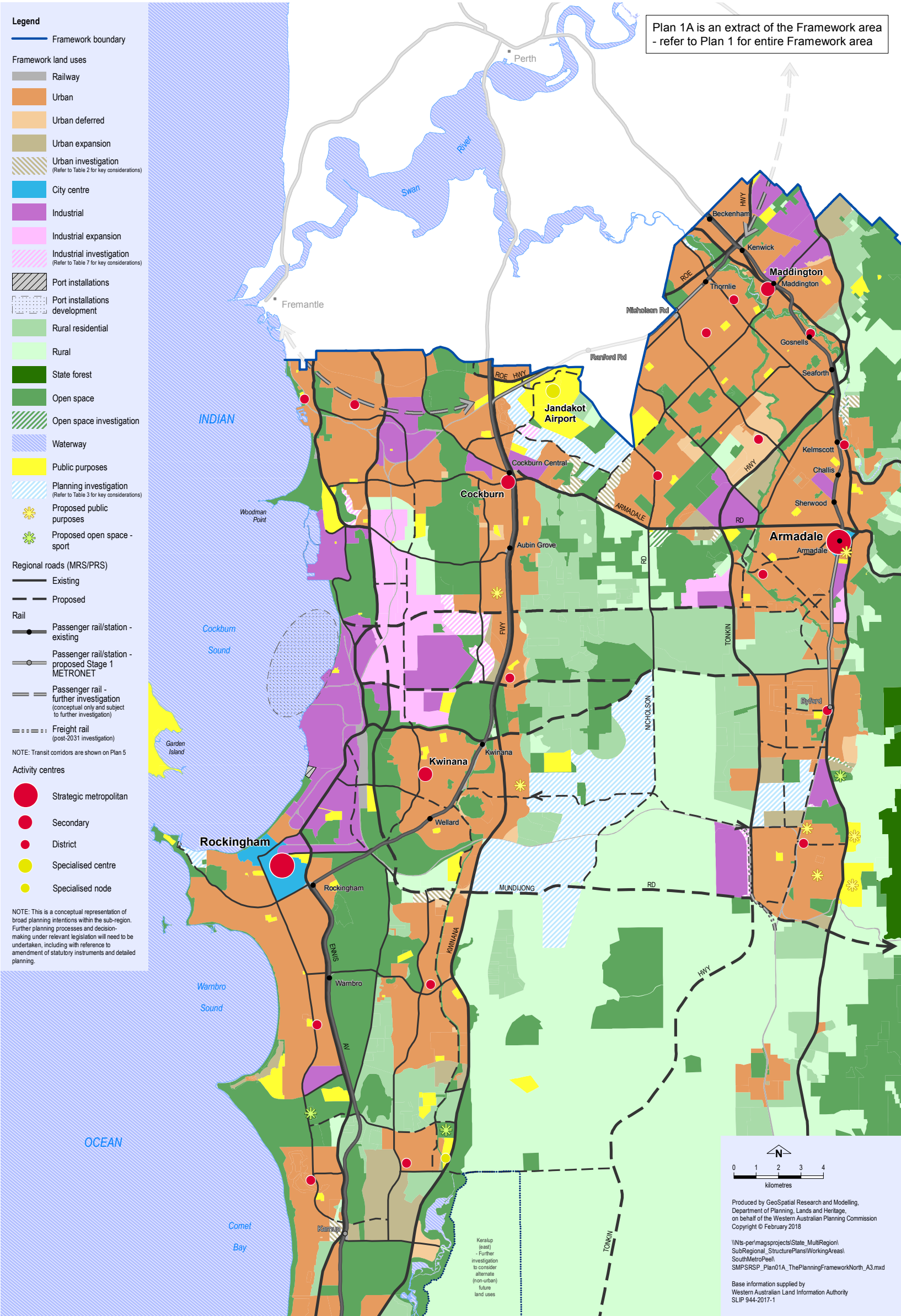
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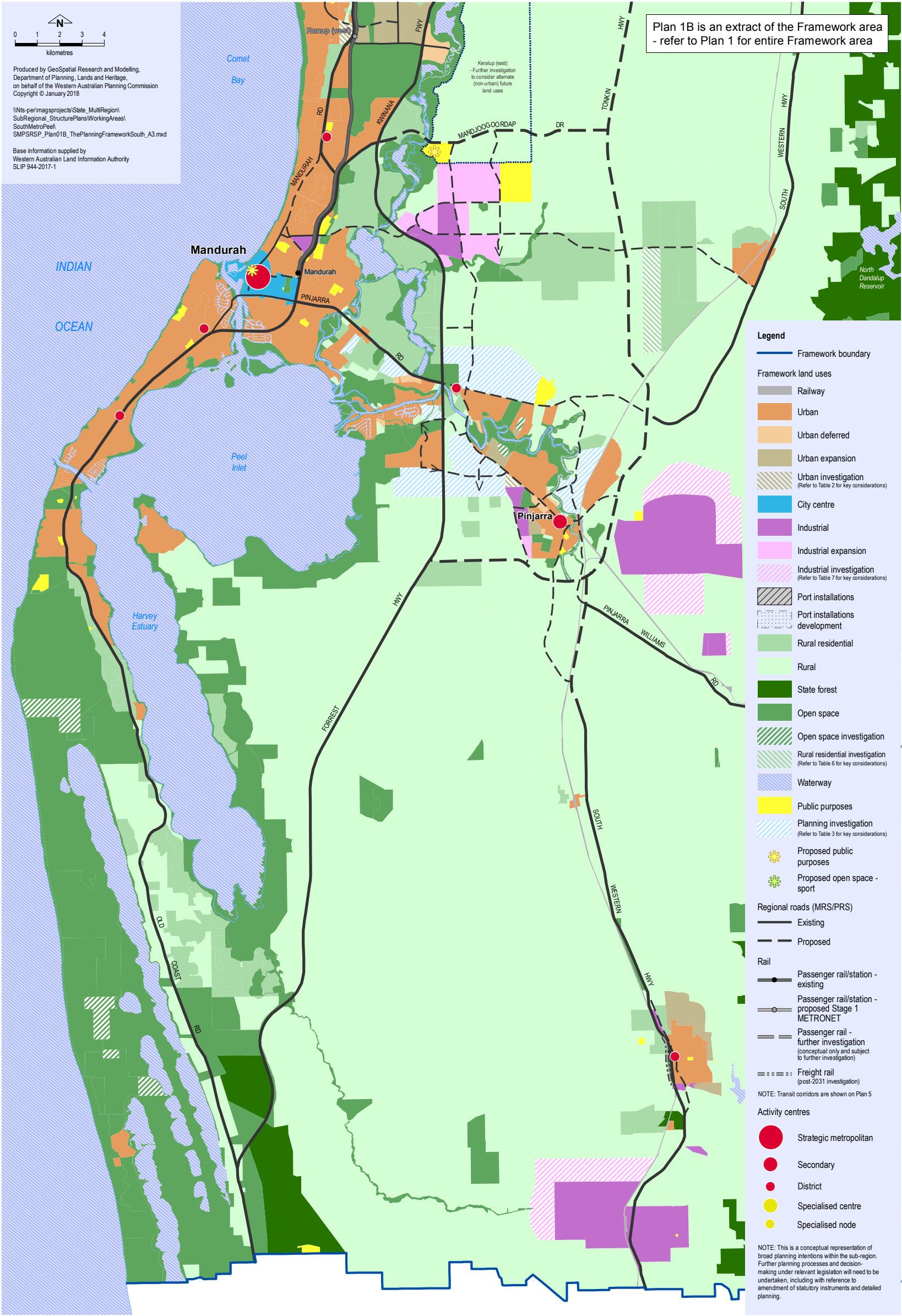
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Appendix 1 – The planning framework
– enlargement plans



PLAN 1A: The planning framework north



PLAN 1B: The planning framework south

Appendix 2 – Consolidated urban form

TABLE 2.1: Existing and projected dwellings and population 2011–50

Local government	Existing dwellings (2011)	Existing population (2011)	Additional dwellings (2050)	Additional population (2050)	Total dwellings (2050)	Total population (2050)
Armadale	25,060	65,400	39,850	95,110	64,910	160,510
Gosnells	40,360	112,440	30,930	69,760	71,290	182,200
Serpentine-Jarrahdale	6,440	18,500	35,800	94,560	42,240	113,060
Cockburn	35,650	95,040	30,120	66,960	65,770	162,000
Kwinana	11,490	30,700	19,550	49,500	31,040	80,200
Rockingham	42,460	109,420	51,130	126,520	93,590	235,940
Mandurah	35,400	73,440	28,020	74,620	63,420	148,060
Murray	6,750	14,770	61,180	149,480	67,930	164,250
Waroona	1,880	3,720	5,600	14,510	7,480	18,230
Total	205,490	523,430	302,180	741,020	507,670	1,264,450

The information in Table 2.1 identifies the existing and projected number of dwellings and population for the sub-region in 2011 and 2050, based on the draft framework scenario.



TABLE 2.2: Additional dwelling and population capacity

Category	Gross site area (ha)	Additional dwellings	Additional population
Infill	-	75,510	166,120
Undeveloped Urban and Urban Deferred	14,130	165,440	473,630
Urban Expansion/ Investigation	3,290	37,490	108,530
Total	17,420	278,440 *	748,280

Table 2.2 identifies the estimated additional number of dwellings and population capacity for the proposed consolidated urban form, including infill, undeveloped Urban and Urban Deferred zones (MRS and PRS), Urban Expansion and Urban Investigation areas.

Note: *Additional dwelling capacity may be required from some of the identified Planning Investigation areas.

The consolidated urban form has:

- capacity for approximately 38 per cent of the additional dwellings in the sub-region to be provided in established urban areas as urban infill development (with an occupancy rate of 2.2 people per dwelling);
- a land supply of 29, 51 and 40 years for the western, eastern and Peel sectors respectively (based on average consumptions of 220, 140 and 100 hectares per annum respectively, excluding urban infill development);
- an overall urban land supply of about 38 years, based on an average consumption of 460 hectares per annum, excluding infill development;
- new urban areas generally based on achieving the minimum average density targets of 15 dwelling units per gross hectare of Urban zoned land and occupancy rates of 2.89, 2.95 and 2.68 people per dwelling for the respective sectors;
- made allowance for land required for future region scheme reservations, major drainage requirements and retention of environmental attributes; and
- excluded land classified for Planning Investigation.

TABLE 2.3: Urban deferred land – key issues

Site	Issue(s) requiring resolution
Munster urban deferred precinct	Located within Woodman Point wastewater treatment works buffer. Suitable non-residential uses yet to be determined
Branch Circus, Bartram and Hammond roads, Success	Local structure planning (including identification of conservation land) required
Latitude 32 – future investigation areas	Refer to Table 7: Industrial Investigation Areas – Key Considerations
Lyon Road, Wandí	Local structure planning required
Anketell Road, Wandí/Anketell	Finalisation of detailed regional road design required
Woolcoot Road, Wellard	Affected by live sheep storage area buffer
Kerosene Lane, Baldivis	Within extractive industry buffer
Mundijong Road, Baldivis	Confirm final land requirements for long-term interchange design at Kwinana Freeway and Mundijong Road
Keralup (west)	Subject to review in relation to potential for urban development or staging required to form a logical extension of urban development, bushfire risk considerations and feasibility of service provision
Harrisdale	Resolution of potential land use conflicts related to existing kennel activities
Southern River urban deferred land	Drainage and environmental considerations require resolution. Local structure planning also required
Cardup (east)	Quarry operations may impede future use for urban purposes. Suitable response yet to be determined The land also includes Bush Forever Site 271, which is not available for urban use
Mundijong – Bush Forever Site 354	Bush Forever site
Lot 393 South Yunderup Road, South Yunderup	Site predominantly comprises remnant vegetation and wetlands with potential regional significance
Pinjarra Road, North Yunderup	Future road widening requirements for Pinjarra Road need to be determined
Lloyd Avenue/Rodoreda Crescent, Ravenswood	Structure planning required for broader precinct
Old Mandurah Road, Ravenswood	Future road widening requirements for Old Mandurah Road need to be determined
Moore's Road, Pinjarra	Future road widening requirements for Moore's Road (proposed regional road) need to be confirmed

Table 2.3 identifies sites that, given their land use or surrounding land uses, are likely to remain Urban Deferred in the longer term. Other sites currently zoned Urban Deferred that are likely to be suitable for urban development in the shorter term have been classified as Urban on Plan 1 – planning framework. These sites will still be subject to a request for lifting of urban deferment under the MRS or PRS and further detailed planning.

TABLE 2.4: Urban infill dwelling targets by local government

Local government	2011–16	2016–21	2021–26	2026–31	Total 2031	Post-2031	Total infill (2050)
Armadale	3,070	2,150	1,980	1,600	8,800	6,220	15,020
Gosnells	2,130	1,620	2,010	1,750	7,500	5,300	12,800
Serpentine–Jarrahdale	205	240	150	205	800	570	1,370
Cockburn	2,980	2,790	1,690	1,140	8,600	6,080	14,680
Kwinana	130	300	300	70	800	570	1,370
Rockingham	2,190	2,230	2,085	2,095	8,600	6,080	14,680
Mandurah	2,795	1,940	2,180	1,585	8,500	6,010	14,510
Murray	80	90	140	320	630	450	1,080
Total	13,580	11,360	10,535	8,765	44,230	31,280	75,510

The proposed consolidated urban form places a greater emphasis on urban infill dwellings with the introduction of minimum infill dwelling targets. To assist in the preparation of local planning strategies, Table 2.4 provides a timing projection for the minimum infill dwelling targets for each respective local government in five-year intervals.



Appendix 3 — Economy and employment

TABLE 3.1: Employment self-sufficiency 2011–50

Indicator	Sector	2011	2050	Total change	Total % change
Population	Western	235,150	478,120	242,970	106%
	Eastern	196,330	455,750	259,420	130%
	Peel	91,930	330,540	238,610	259%
	Total	523,410	1,264,420	741,000	141%
Labour force	Western	113,060	234,760	121,700	108%
	Eastern	94,600	223,740	129,140	137%
	Peel	37,710	134,480	96,770	257%
	Total	245,370	592,990	347,620	142%
Jobs	Western	74,030	195,115	121,090	164%
	Eastern	42,720	137,030	94,310	221%
	Peel	27,220	105,580	78,350	288%
	Total	143,970	437,730	293,750	204%
Employment self-sufficiency	Western	65%	83%	18%	-
	Eastern	45%	61%	16%	-
	Peel	72%	79%	6%	-
	Sub-region	59%	74%	15%	-

Adjustments were made to employment self-sufficiency estimates in the 2001, 2006 and 2011 Census data, published in *Delivering Directions Annual Report Card 2013*, to account for and redistribute census respondents not indicating where in Western Australia their job is located. This provides a higher estimate of employment and subsequently higher employment self-sufficiency.

The projections in Table 3.1 are based on the draft framework scenario and also exclude future consideration of Planning Investigation areas.



TABLE 3.2: Activity centre hierarchy

Hierarchy classification	Sector	Activity centre
Strategic metropolitan centre	Eastern	Armadale
	Western	Rockingham
	Peel	Mandurah
Secondary centre	Eastern	Maddington
	Western	Cockburn Central Kwinana
	Peel	Pinjarra
District centre	Eastern	Thornlie
		Forest Lakes
		Gosnells
		Harrisdale*
		Kelmscott
		Southern River**
		Hilbert (Wungong)*
		Byford*
		Mundijong*
	Western	Cockburn Coast*
		Spearwood
		Wandi*
		Baldivis
		Karnup**
		Warnbro
		Secret Harbour
	Peel	Lakelands*
		Halls Head
		Falcon
		Ravenswood Riverfront*
		Waroon
Specialised centre	Western	Jandakot Airport

* Denotes emerging centre

** Denotes new centre

Table 3.2 sets out the key activity centres for the sub-region, including existing, emerging and new centres. Additional centres may be identified as part of the review of Planning Investigation areas.

TABLE 3.3: Anticipated job numbers for activity centres

Activity centre	2011	2050	Total additional (2011–50)
Strategic metropolitan centres			
Eastern sector			
Armadale	3,060	5,210	2,150
Western sector			
Rockingham	6,790	12,290	5,500
Peel			
Mandurah	3,470	10,280	6,810
Secondary centres			
Eastern sector			
Maddington	2,310	4,610	2,300
Western sector			
Cockburn	1,770	5,540	3,770
Kwinana	1,300	5,760	4,460
Peel			
Pinjarra	750	Subject to review	Subject to review
Specialised centres			
Western sector			
Jandakot Airport	1,260	2,080	820

Table 3.3 reflects the anticipated job numbers for strategic metropolitan centres and secondary centres within the sub-region from 2011 to 2050. The job numbers are a projection only, based on the draft framework scenario and subsequent refinements following public consultation. These numbers may vary due to a number of factors including, but not limited to, the economy and infrastructure provision. They also exclude future consideration of Planning Investigation areas.

TABLE 3.4: Industrial land demand

Timeframe	Gross demand (ha)			
	Western sector*	Eastern sector	Peel**	Sub-region
To 2021	465	335	350	1,150
2022 to 2031	665	480	500	1,645
Post 2031	1,260	910	955	3,125
Total	2,390	1,725	1,805	5,920

* Does not include estimated average annual demand for Henderson, Kwinana and Rockingham industrial areas (20.9 ha per annum)

** Does not include estimated average annual demand for Alcoa, Pinjarra and Wagerup (19 ha per annum)

The projected demand for non-strategic industrial land is based on the draft framework scenario average demand of 164.5 hectares (gross) per annum. The total number of years addressed within the demand is 36 (2015 to 2050 inclusive). Table 3.4 also excludes future consideration of Planning Investigation areas.



TABLE 3.5: Industrial centres – proposed land supply

Site	Gross Area (ha)*	Sub-regional Planning Framework
MRS/PRS undeveloped industrial**	1,780	Industrial
Munster	50	Industrial Investigation
Latitude 32 / Postans	1,780	Industrial Expansion
Latitude 32 – future investigation areas	480	Industrial Investigation
South Forrestdale	180	Industrial Expansion
South Armadale	80	Industrial Expansion
Nambeelup	1,060	Industrial Expansion
Pinjarra	40	Industrial Expansion
Total	5,450	

* Gross area is site area prior to deductions for environmental and other features such as roads and buffers (as at 2014).

** Includes Forrestdale industrial areas within the MRA area.

When considering industrial land supply in the sub-region please note the following:

- Does not include the portion of Jandakot Airport dedicated to industrial purposes, or related Industrial Investigation area, as it is an incidental use within the airport site.
- Excludes bulky goods/light industrial uses within urban areas (e.g. Forrestdale (townsite east) and Baldivis – Kerosene Lane).
- Does not include land for strategic industries at Alcoa Pinjarra and Wagerup, Henderson industrial area or Kwinana Industrial Area/Rockingham industrial areas.
- Does not include existing Alcoa residue storage area at Hope Valley.
- Additional land may also be identified as part of the review of Planning Investigation areas.

To 2050, it is anticipated that job numbers within the industrial centres will be concentrated within the Latitude 32 and Nambeelup industrial centres, with a total of approximately 24,000 additional jobs being provided within these two centres. Industrial centres at Forrestdale, Maddington/Kenwick and Mundijong–Cardup are also predicted to accumulatively contribute approximately 20,000 jobs during this timeframe. The job numbers are a projection only, based on the draft framework scenario, and may vary due to a number of factors including economic drivers, staging and sequencing of land uses as well as infrastructure provision.

APPENDIX 4 — Environment and landscape

TABLE 4.1: Land reserved for parks and recreation/regional open space and State forest
- region schemes

Region/Sub-region	Parks and Recreation/ Regional Open Space (Ha)	State Forests (Ha)	Total Reserved (Ha)
Central	5,460	-	5,460
North-West	26,710	16,280	42,300
North-East	47,440	32,530	79,970
Eastern sector	21,580	65,000	86,580
Western sector	10,980	-	10,980
Peel sector	33,320	98,880	132,200
Total Perth and Peel	145,490	212,690	358,180

Does not include new areas identified in framework.

Table 4.1 identifies the amount of land reserved in the Perth Metropolitan and Peel Region Schemes for parks and recreation and State forests in 2016.

