



Department of Planning,
Lands and Heritage



Western
Australian
Planning
Commission

Perth and Peel@3.5million

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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“When **Perth** reaches a population of **3.5 million people**, it will continue to be an **innovative 21st century city** delivering distinctive Western Australian **lifestyle choices** and **global opportunities**.”

Liveable: A city with an enviable quality of life characterised by a community which is diverse and inclusive; engaged and creative; safe and healthy.

Prosperous: A city that capitalises on technology and innovation to deliver a strong, competitive economy; efficient infrastructure; and an engaged community and will become a destination of choice for skilled migrants and business investment from around the globe.

Connected: A well-served, accessible and connected city with strong regional, national and international links. People will be able to move freely around the city via a choice of efficient transport modes.

Sustainable: Perth will responsibly manage its ecological footprint and live within its environmental constraints, while improving our connection with and enjoyment of the natural environment.

Collaborative: Government, business and the community will collaborate to progress the aims and objectives of the city as a whole.



Perth and
Peel@3.5million

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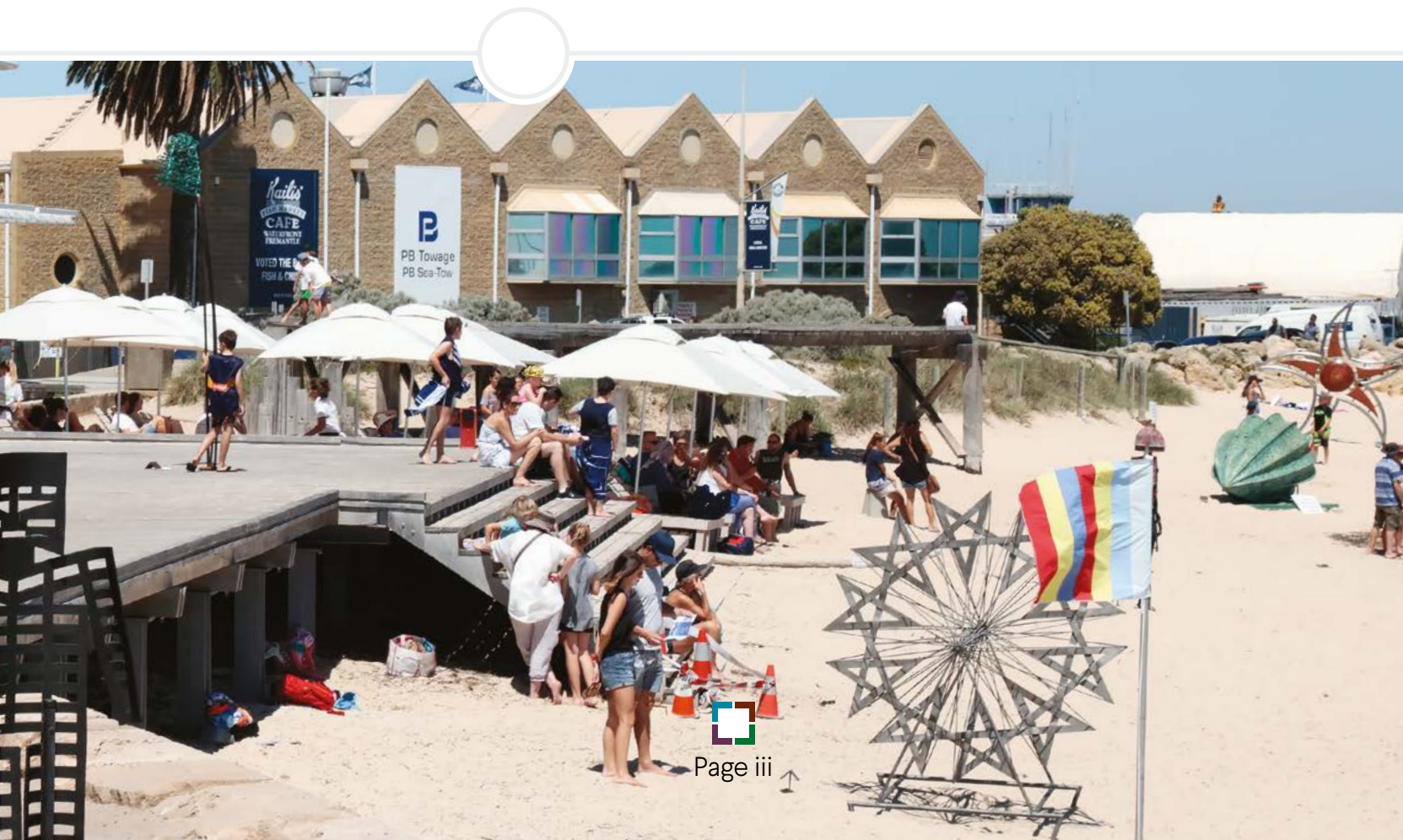
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Foreword

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

Sustainable growth requires a shift in our thinking and a readiness to explore and plan for new urban growth opportunities



Perth and Peel: A city@3.5million

Today, the Perth and Peel regions stretch more than 150 kilometres from Two Rocks in the north to Bouvard in the south and are home to more than two million people.

And while it took 180 years to reach that population figure, it is estimated on current trends that more than 3.5 million people will live in Perth and Peel by 2050.

Land for residential, commercial and industrial development is a finite resource and Perth and Peel cannot sustain a widespread pattern of development, based on historical and traditional notions of what constitutes a household, a home and a community.

While this growth brings enormous opportunities, it also increases demand on the State's resources, social and physical infrastructure, services and natural environment.

Sustainable growth requires a shift in our strategic land use planning approach and a readiness to explore and plan for new urban growth opportunities. It demands a dynamic approach that responds to periods of rapid population growth, changing economic conditions, shifts in demographics and evolving needs from industry and community. In particular, supporting this growth and delivering an efficient and liveable city while protecting our unique natural environment poses a significant, ongoing challenge.

To realise the vision articulated in *Directions 2031 and Beyond* and the *State Planning Strategy 2050*, the Western Australian Planning Commission, through the Department of Planning, Lands and Heritage has created four detailed land use planning and infrastructure frameworks, responding to those deepening and emerging challenges, with a unified, long-term growth strategy for land use and infrastructure provision for the Perth and Peel regions.

The *Perth and Peel@3.5million* strategic suite of documents clearly spells out what our city could look like in the future, how we can maintain our valued lifestyle and how we can realistically accommodate a substantially increased population.



The original draft documents, released for comment in May 2015, have been further refined following extensive community and stakeholder consultation.

The four planning and infrastructure frameworks for the Central, North-West, North-East and South Metropolitan Peel sub-regions (Figure 1) provide guidance on sustainable development over the next three decades to ensure the impact of urban growth on areas of environmental significance is minimised; to protect our heritage; and importantly, to maximise the benefits of available land and existing infrastructure.

They provide an unprecedented level of certainty about the amount of land available and the best areas identified for urban expansion, including residential, commercial and industrial development.

In this context, the frameworks are an important mechanism for managing urban growth and achieving the increased urban consolidation and residential housing choice required to accommodate our anticipated long-term population growth.

The frameworks provide opportunities for higher-density residential development, particularly around activity centres, station precincts and along high-frequency public transport routes.

They guide infill development to deliver a more compact and connected city and promote the connectivity and development of activity centres, corridors, industrial nodes and station precincts to drive employment opportunities outside the Central Business District. This is crucial in achieving the key objective to provide employment options where people live, thereby reducing the need for people to commute long distances for work.

This strategic planning approach is the next phase of decision-making and guidance for a Perth and Peel that is evolving fast. It captures the collaborative thinking and connected approach that must typify the work of all stakeholders and the community if we are to achieve an innovative, 21st century city delivering distinctive and varied Western Australian lifestyle choices and global opportunities.

The vision for Perth and Peel is very clear – a great, connected city that is globally competitive and technologically advanced; that is sustainable, resilient and respects its natural assets and heritage; that maximises the use of new and existing infrastructure; that offers a mix of housing and lifestyle choices; and that respects and acknowledges the regions' sensitive natural environments and their respective ecosystems.

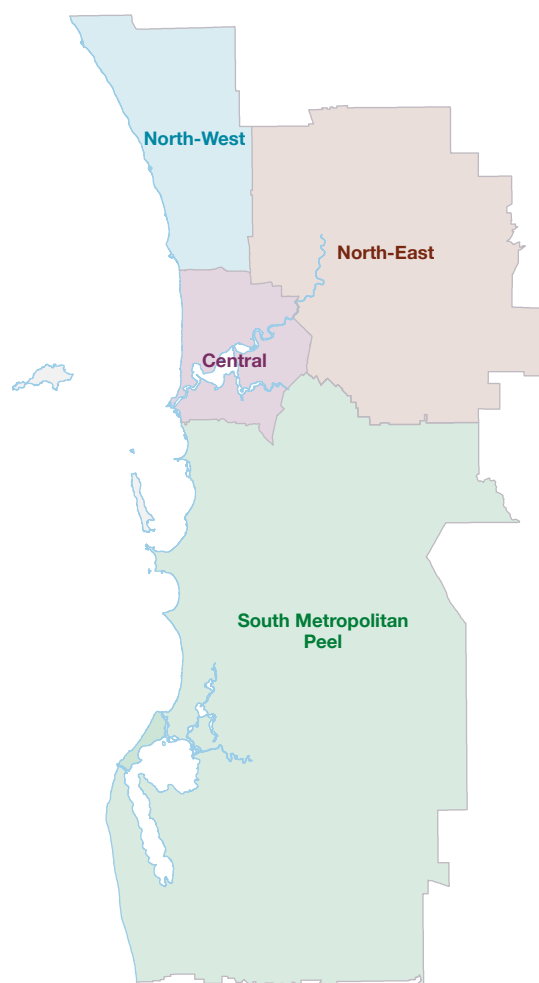
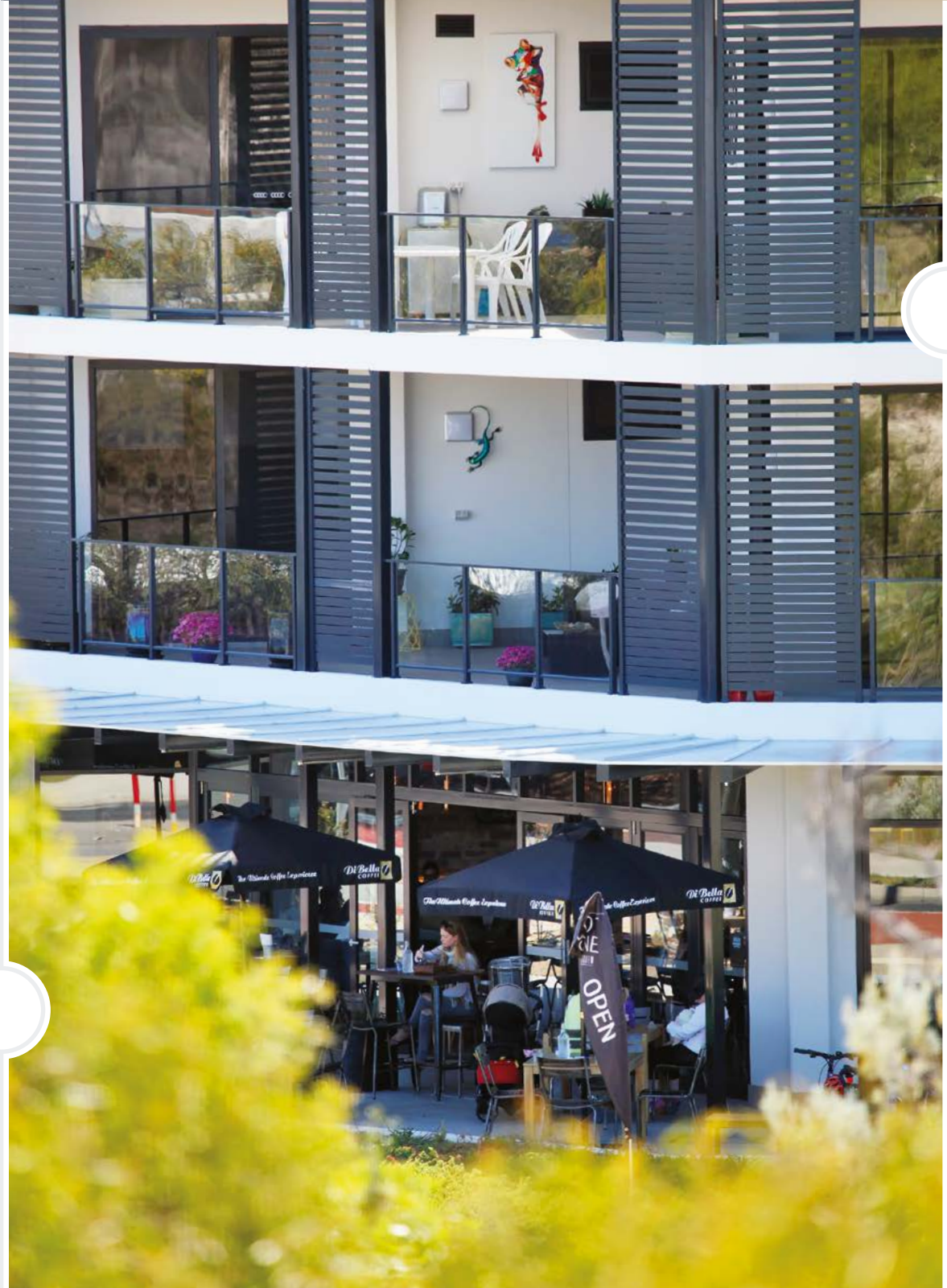


FIGURE 1: Sub-regional boundaries



HISTORICAL CONTEXT

A series of landmark plans and statutory processes that helped to shape the Perth and Peel regions also identified the importance of preserving our unique local environment and valued quality of life



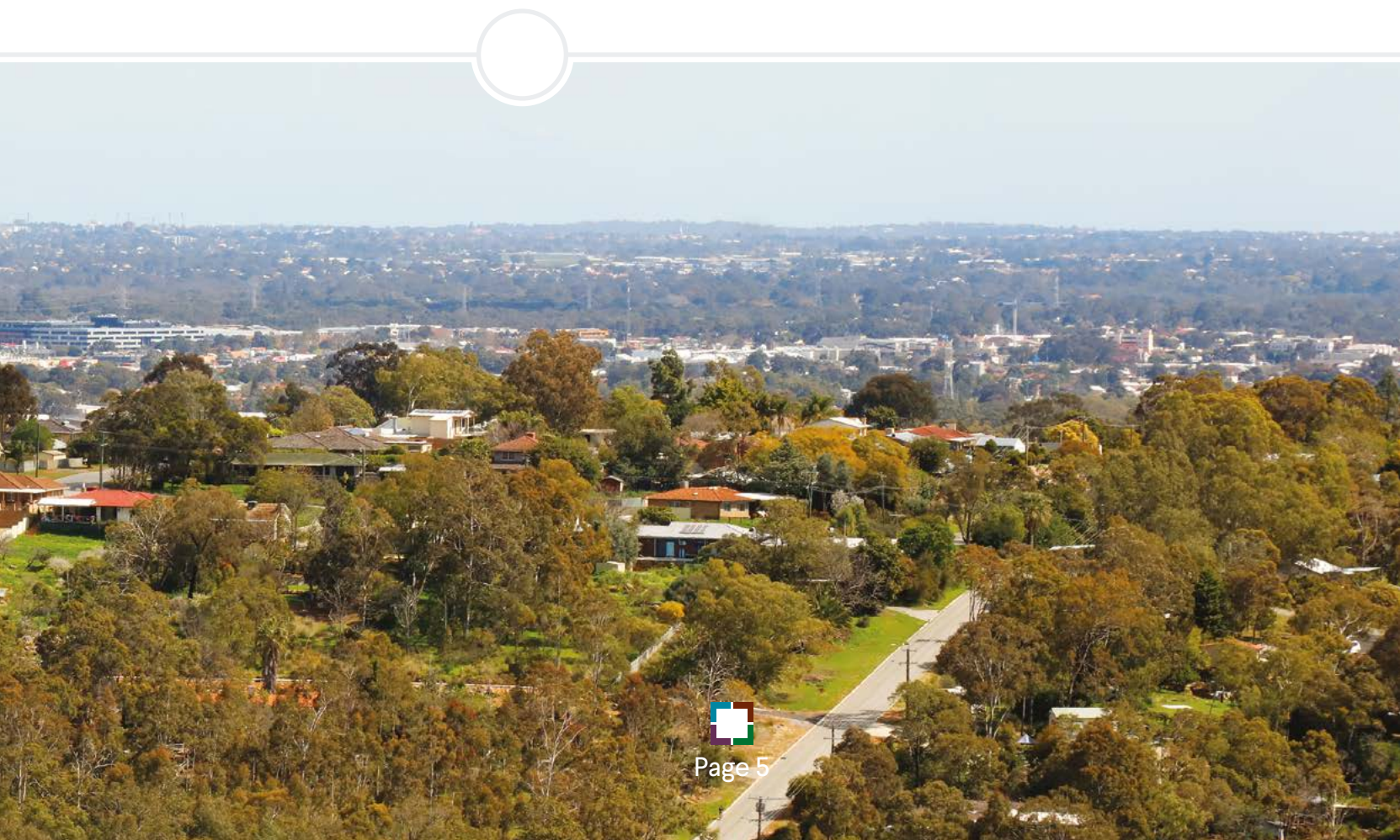
Perth's evolution from Swan River settlement to thriving capital city has been punctuated by short periods of intensive development, intrinsically linked to significant economic, social or technological change and interspersed by longer periods of relatively steady growth (Figure 2).

A series of landmark plans and statutory processes that helped to shape the Perth and Peel regions also identified the importance of preserving our unique local environment and valued quality of life while endeavouring to cater for a growing population. Each in its way has tried to find that key balance between acceptable urban infill and inevitable fringe development, towards a more compact and environmentally sustainable city.

For the most part, they have focussed on developing regions with urban development areas separated by green wedges with a series of non-urban uses and regional open space, protecting sensitive wetlands and ecosystems where possible:

- **1928** – the *Town Planning and Development Act* heralded the first emergence of contemporary town planning in Perth as the region's population expanded.
- **1955** – the *Plan for the Metropolitan region Perth and Fremantle*, better known as the Stephenson-Hepburn Plan after its principal authors, is the landmark document that defined Perth. This holistic plan was designed to accommodate 1.4 million people by 2005 and
- **1963** – implementation of the Stephenson-Hepburn Plan began through the Metropolitan Region Scheme, still in place today as the overarching statutory planning framework for the Perth metropolitan area.

predicted Perth's population growth and decentralised growth patterns with remarkable accuracy. It also provided the basis for the city's current spatial form, with urban areas separated by green wedges of non-urban land. It set the groundwork for the development of regional national parks and identified the importance of securing river foreshores and coastal zones for the benefit of all Western Australians.



- **1970** – the *Corridor Plan* aimed at channelling urban growth along self-sufficient corridor communities, with non-urban green wedges between each corridor.
- **1990** – *Metroplan* aimed at consolidating development within existing urban areas as well as on the extremities of the region. It placed emphasis on establishing efficient public transport routes and on planning for industrial and commercial land use and development.

- **2004** – *Network City* built on the principles of urban consolidation with Perth as a connected city with higher densities around transport nodes and areas of employment. It emphasised growth management in an effort to contain urban fringe development.
- **2010** – *Directions 2031 and Beyond* advocated the benefits of a more compact and environmentally sustainable city. It identified the need for an urban expansion management program to accommodate a city of 3.5

million people and promoted the continuing consolidation of urban growth through significantly greater rates of infill development.

It promoted Perth as a connected city, characterised by a greater balance between greenfield and infill development; protecting and enhancing the increasingly vulnerable natural environment, agricultural land, open spaces and heritage places; developing and revitalising activity centres as attractive places to live and work; and promoting options for economic development.

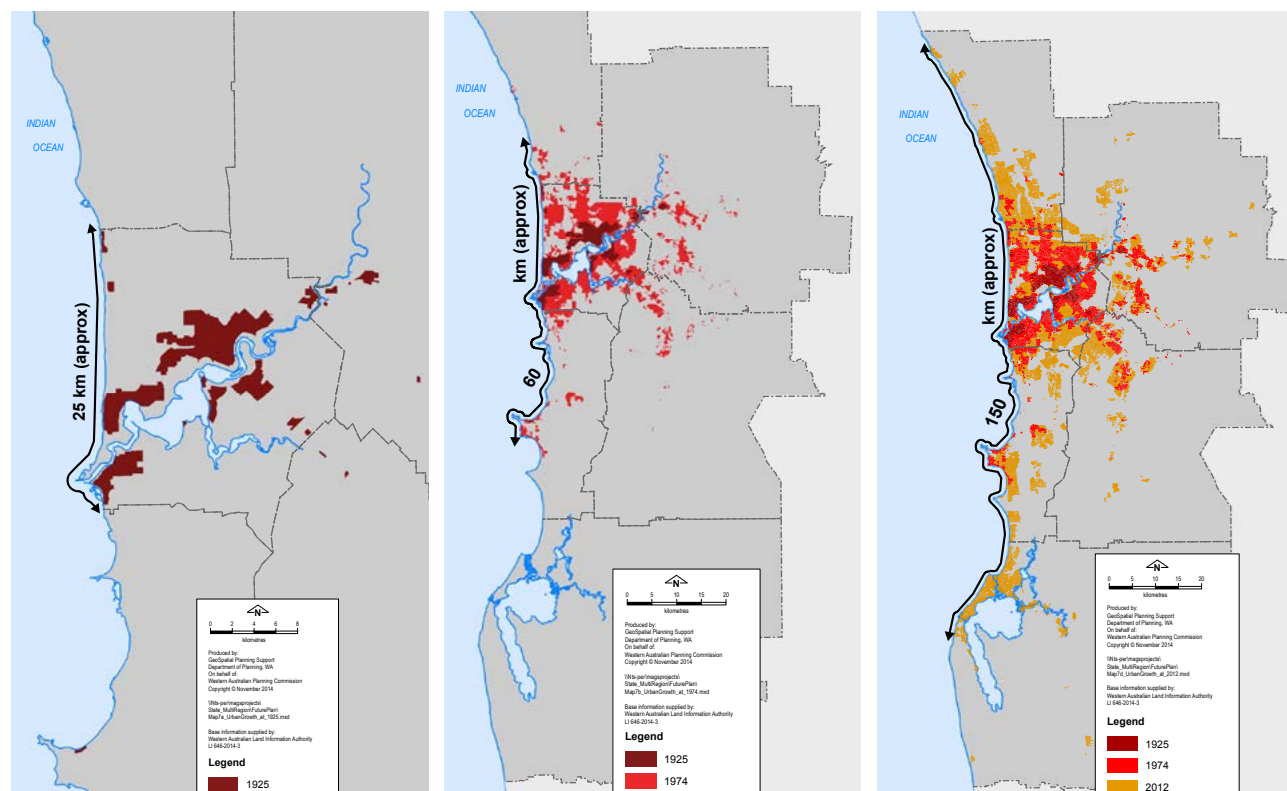


FIGURE 2: Urban expansion from 1925 to 2012

2.1 The planning context

The sub-regional planning and infrastructure frameworks will be recognised within *State Planning Policy 1 State Planning Framework* and will be taken into account when strategies, policies and plans within the sub-region are prepared or reviewed.

The frameworks will provide 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.

State Planning Strategy 2050

This is Western Australia's leading strategic integrated land use planning document, 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 (75 per cent of the State's population) based on a high growth scenario.

Directions 2031 and Beyond

Released in 2010, this high-level strategic plan for Perth and Peel 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.

It 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 to 15; and
- sets a target for a 50 per cent increase from the then 30-35 per cent level of urban infill development, to 47 per cent, within the Perth and Peel regions.

Additionally, the plan sought 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* form the basis for the development of *Perth and Peel@3.5million* spatial plan. In the event of any inconsistency between *Directions 2031 and Beyond* and the frameworks, the frameworks will prevail.

Perth and Peel@3.5million

The overarching document builds on the vision laid down in *Directions 2031 and Beyond* and provides a link across the four sub-regional land use planning and infrastructure frameworks that define the Perth and Peel spatial plan for the next 30 years.

The frameworks adhere to the principles detailed in *Directions 2031 and Beyond*. They are recognised under the *State Planning Framework (State Planning Policy No.1)* and are to be taken into account when preparing and reviewing strategies, policies and plans (Figure 3). They provide clear, definitive direction and guidance to government agencies and local governments on land use, land development, environmental protection, infrastructure investment and the delivery of physical and social infrastructure.

The frameworks will be reviewed after three years.

The Metropolitan Region Scheme (MRS) and the Peel Region Scheme (PRS)

These are the statutory planning schemes for the Perth and Peel regions and principal statutory mechanisms for implementing future strategic land use and infrastructure proposals. They provide for land (and water) acquisition for public purposes such as regional open space, public uses and infrastructure as well as protection for critical natural environmental attributes.

Local government planning (including local planning schemes) is required to be consistent with the broad land uses under the MRS and PRS.

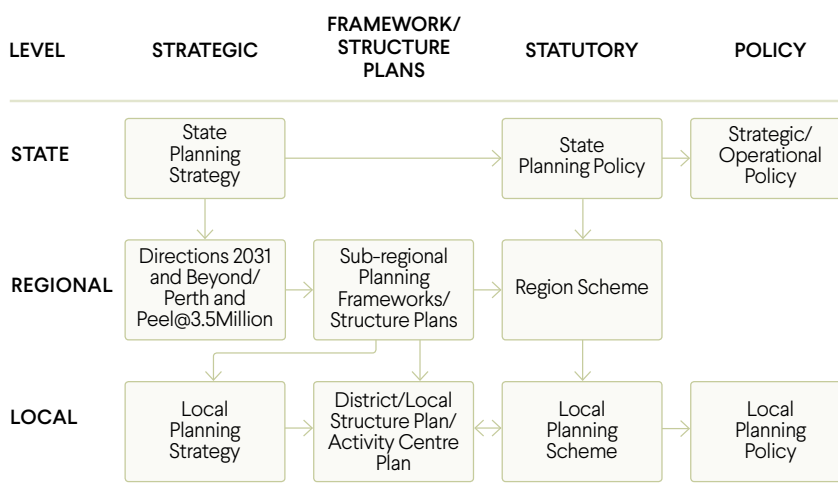
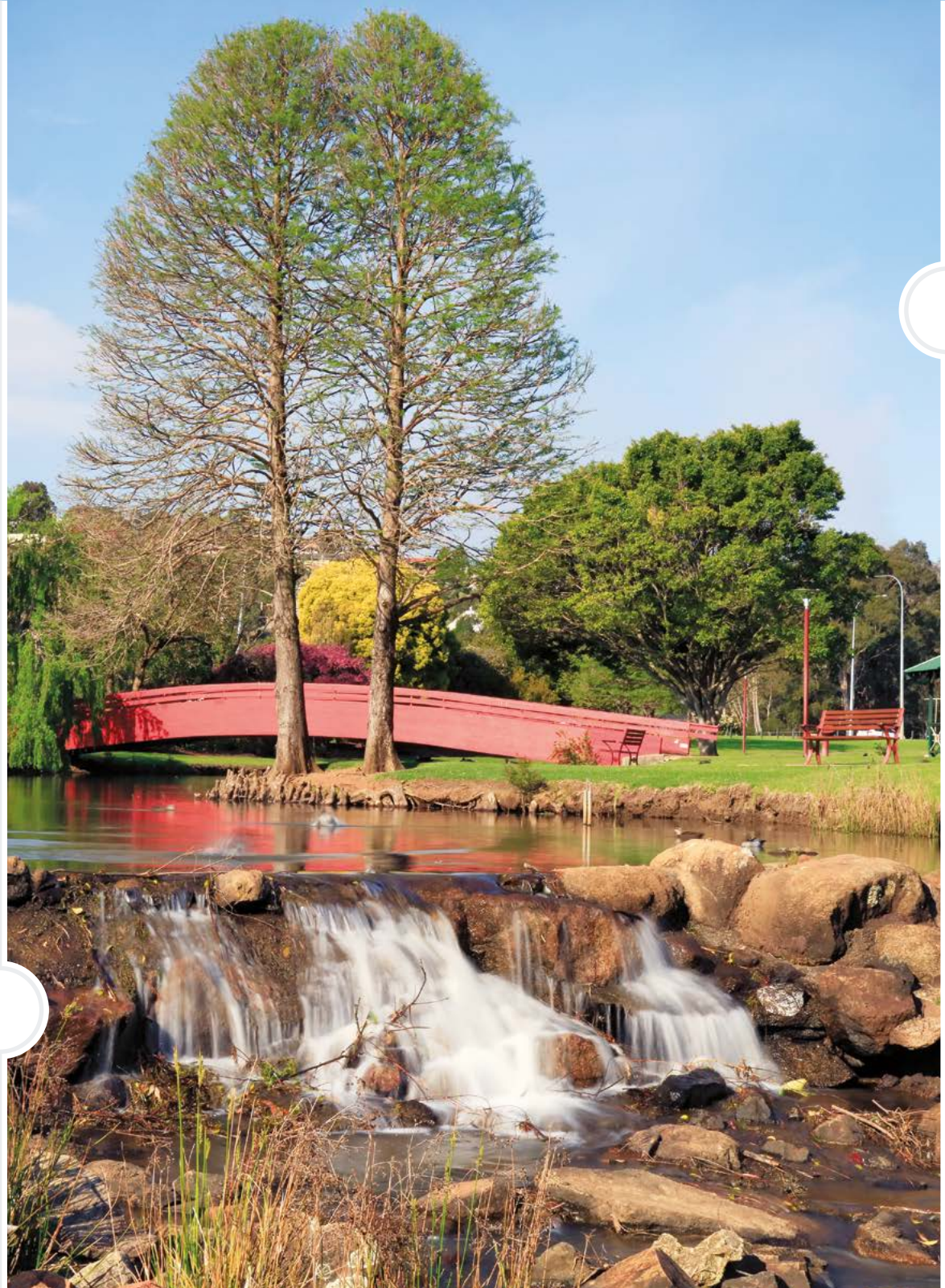


FIGURE 3: Western Australian Planning Framework





PERTH 2050 – THE NEED FOR CHANGE

People have been drawn, nationally and internationally, by the promise of work in the West and the inherent liveability of Perth and Peel



“ If we do not plan for population growth and manage the future urban form of our city, growth pressures and unfavourable patterns of development can have serious impacts on our communities and their environments. These include a lack of access to essential infrastructure and services or increased response times for emergency services.

New urban areas must be planned to reduce dependency on private vehicle use, reducing greenhouse gas emissions and air pollution. People living in areas with limited access to public transport or jobs will experience increased travel time to access work in other areas, traffic congestion and higher private transport costs to households as well as reduced leisure time, declining community health and increasing obesity as walking and riding become less practical.

The principles of good urban growth management should be applied to the planning of new areas to reduce any negative impacts on water resources; to avoid the loss of a sense of place; and to protect our natural habitats and agricultural food-producing land close to the city. ”

Directions 2031 and Beyond (2010)



3.1 Beyond Directions 2031

A multiplicity of factors comes into play when determining where to live but employment and amenity – liveability – are fundamental drivers of population growth.

People have been drawn, nationally and internationally, by the promise of work in the West and the inherent liveability of Perth – listed in the Economist Global Liveability Survey's 10 most liveable cities every year since 2004 – and Peel.

However, Perth is a clear example of a sprawling city, where much of the housing supply comes as low-density, detached dwellings and greenfield development on the urban fringes has previously accounted for almost three-quarters of all new development.

One evident result has been the elongated, corridor-style urban form predominantly along the coastline and transport corridors. While this has offered obvious lifestyle opportunities and lower construction costs in the past, it now brings with it a range of complex and interrelated challenges.

These include:

- accommodating significant population growth
 - an additional 1.5 million people will live here by 2050
 - greater cultural and demographic diversity will continue to influence the composition of future households
 - the 'business-as-usual' approach will not adequately provide accommodation, services and infrastructure to support this population increase.



- improving current density infill and managing further greenfield development
 - there is sufficient undeveloped land to meet future residential and employment demands providing infill and density targets are met
 - rates of infill development rose from 27 per cent to 34 per cent in 2016; the target for 2050 is 47 per cent
 - infill rates are expected to increase over time to enable housing and travel choices and address housing affordability and liveability demands
 - gross urban zone dwelling density will continue to rise.
- achieving a connected city growth pattern
 - the regions now stretch for more than 150 kilometres along the coast
 - new jobs and homes need to be increasingly focussed in existing activity centres, integrated with efficient public transport routes
 - managing further greenfield development to limit urban sprawl and adverse environmental, social and economic impacts.
- increasing housing diversity and affordability
 - 800,000 new homes are required to accommodate 1.5 million extra people
 - 380,000 of these will be predominantly in strategic infill locations
 - 78 per cent of the current housing supply are detached houses
 - affordable housing does not always equate to living affordability
 - providing greater housing choice for a growing ageing population and diverse demographic impacts on household composition.
- reducing car dependency
 - Perth has one of the highest car use rates in the world with more than three quarters of people travelling to work by car, a key contribution to traffic congestion
 - the cost of Perth's congestion was estimated to be nearly \$1 billion in 2009; by 2020, it could more than double to \$2.1 billion
 - delays in morning peak traffic continue to rise
 - greater provision and use of public transport, such as through the METRONET program will impact significantly on car dependency rates.
- achieving efficient use of water sources in a drying climate
 - Perth's groundwater supply is already under increasing pressure
 - 43 per cent of the potable water supply comes from groundwater, 39 per cent from desalination and 18 per cent from dams and these proportions will need to change as the climate dries and the population grows
 - public drinking water sources require on-going protection for future generations



- recycling of treated wastewater is still an underused climate-resilient resource and initiatives for increased recycling require ongoing support
- urban development is moving into areas with relatively poor drainage with implications for urban form, building design, availability of basic raw materials, liveability and impacts on receiving waters.
- ensuring the regions' environmental assets are protected
 - the Swan Coastal Plain is under increasing pressure due to impacts from development
 - the regions sit within Australia's only global biodiversity hotspot, one of only 34 in the world and effective management of these attributes is critical
 - more than 358,000 hectares of land across Perth and Peel is reserved as parks, recreational/ regional open space, Bush Forever sites or State forest under the Metropolitan Region Scheme and where possible, these areas need to be protected and enhanced.
- maintaining liveability
 - accommodate a significant influx of people without impacting adversely on the regions' amenity and quality of life
 - does affordable housing mean affordable living – it's not always cheaper to live on the outskirts as higher household transport, utilities and other service costs increase over time and associated impacts on State finances
 - the urban fringe accounts for almost three quarters of all new development while 64 per cent of all jobs are in the Central sub-region – better utilisation of economic opportunities is essential.

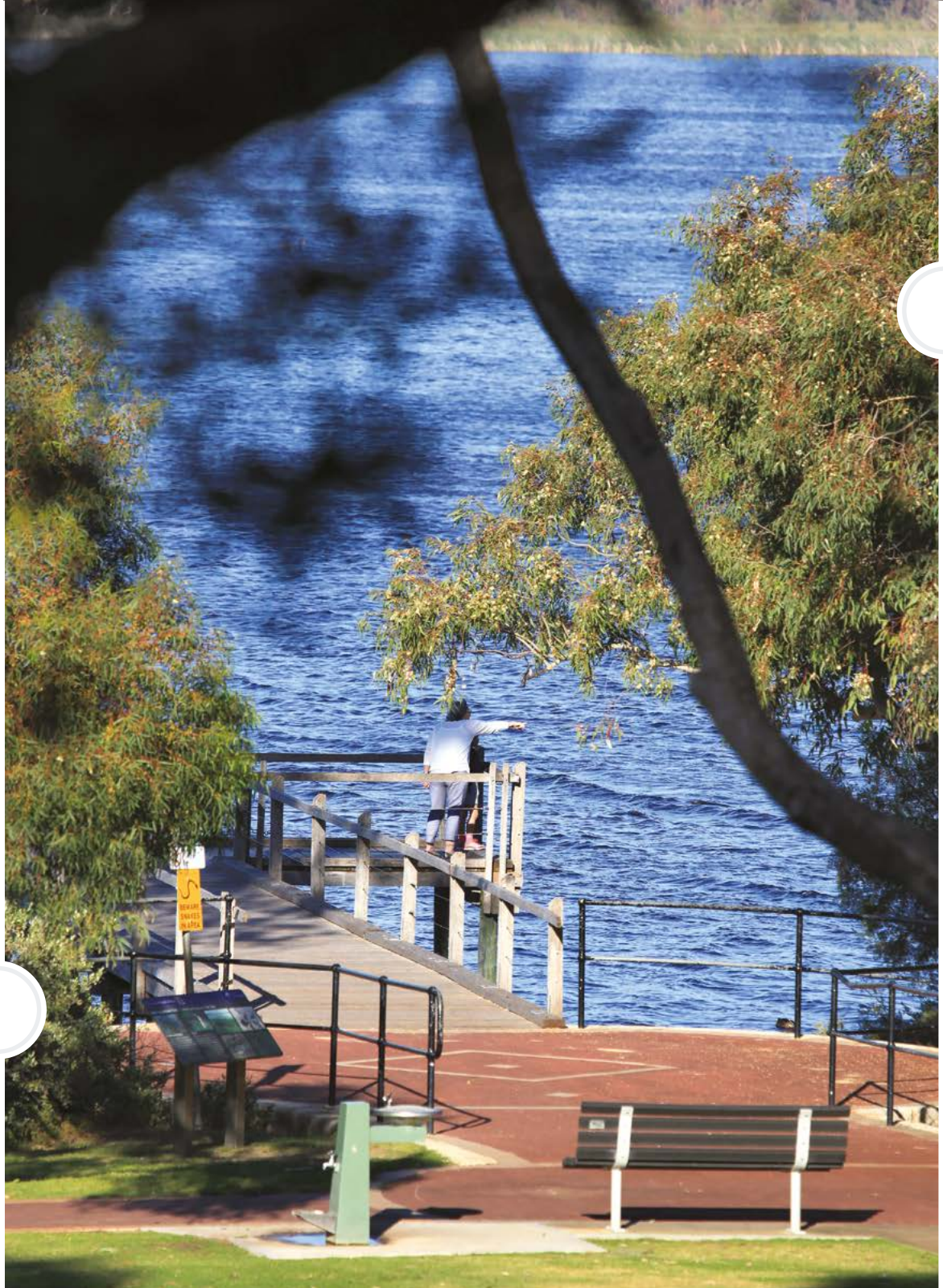
In 2010, building on the aspirations and intentions of previous strategic plans, and in a considered response to these existing and emerging challenges, *Directions 2031 and Beyond* offered an alternative development pattern.

This was characterised by clear provisional targets to achieve a greater balance between greenfield and urban infill development; protecting and enhancing environmental attributes, agricultural land, open spaces and heritage; limited new urban and industrial areas and developing and revitalising activity centres as alternative places to live and work.

It stipulated three integrated networks to form the basis of the spatial framework – activity centres network; movement network; and green network. It also identified the connected city model as the preferred medium-density future growth scenario and it set infill and greenfield housing targets at 47 per cent and 53 per cent respectively by 2050. Planning instruments guiding the development of new urban areas are now required to implement a minimum average residential density target of 15 dwellings per gross hectare of urban-zoned land.

Population growth and demographic change, which will be monitored within the frameworks' review cycle will be a key driver behind the rate and type of future development. The on-going review program, complemented by mechanisms such as the *Urban Growth Monitor* and the *State Lot Activity* will track development rates and will enable timely adjustment of policy and associated implementation mechanisms if consumption rates are higher than anticipated or if infill and density targets are not being achieved.





GROWTH PATTERNS – OUR CHOICE

A connected city was identified as the preferred future growth pattern because it provides the best balance between urban infill and fringe development having regard for economic, social and environmental constraints



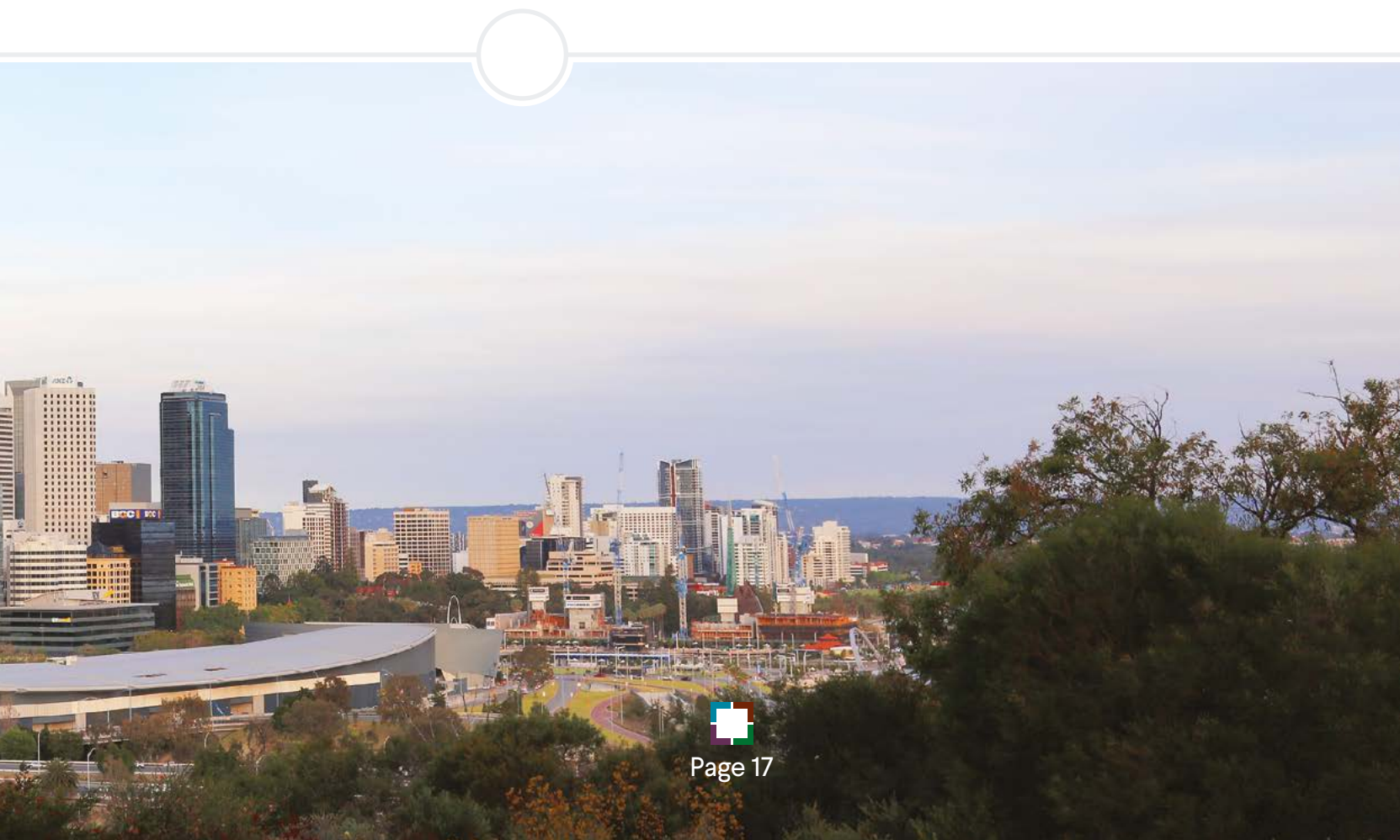
Our fundamental challenge is to ensure that new residents are offered the lifestyle and opportunities a region of 3.5 million people will need through a more liveable, prosperous, connected, sustainable and collaborative future. A connected city growth pattern was identified in previous strategies including *Directions 2031 and Beyond* in 2010 as the most appropriate model to achieve these goals.

There is sufficient land identified across Perth and Peel for urban development within the spatial plan to meet future requirements over the next 50 years, based on average consumption rates and providing infill targets continue to keep pace with demand. Ongoing monitoring and review processes will indicate any development of emerging trends and the need of any required adjustment.

Population and economic growth, accompanied by a shift towards car-based transport and more dispersed growth patterns have fuelled the unprecedented expansion of the regions' urban form over the past 40 years.

This dispersed growth pattern strongly reflects late 20th century lifestyle influences and community demands. While there have been some major advancements in housing diversity and an increased focus on local job creation within greenfield developments, the extent of change in the design and delivery of these developments have not brought about the degree of change needed to accommodate projected population growth, job creation and protection of environmental attributes.

As Perth and Peel grow and change, an ongoing dominance of low-density urban form as the primary response to population growth will continue to place substantial pressure on the regions' environment, resources, infrastructure and amenity.



Three regional growth scenarios were compared in *Directions 2031 and Beyond* to select the urban form that will best achieve the liveable, prosperous, connected, sustainable and collaborative goals for the future (Figure 4).

In a **contained city** scenario, future growth is limited to the existing urban environment with no further greenfield development. The benefits of this scenario are that infill is maximised and that the natural environment and remaining rural land around the city is conserved. Conversely, this outcome will not provide the housing diversity and choice that can be attained on the fringes of the city and is likely to have

the biggest impact on the character of existing suburban areas, which would have to accommodate all new housing and business growth.

The **dispersed city** model would allow unlimited sprawl and the greatest conversion of rural land into new suburbs. This growth pattern delivers long-term new urban land supply on a 'business as usual' basis but achieves few infill opportunities. It also has a substantial adverse impact on the natural environment; reduces the capacity for infrastructure efficiency and requires the greatest infrastructure investment; reduces the ability for agricultural production in the region; and would increase

the vehicle kilometres travelled. It is also likely to exhaust local supplies of basic raw materials (such as sand, gravel, limestone) in a relatively short time frame.

A **connected city** growth pattern delivers a balance between development within the existing spatial framework and development of selected peri-urban areas adjacent to the existing urban front. This will enable the protection of important areas of conservation and agricultural significance; increase land use and infrastructure efficiencies over the current model; and enable better public transport and land use integration.

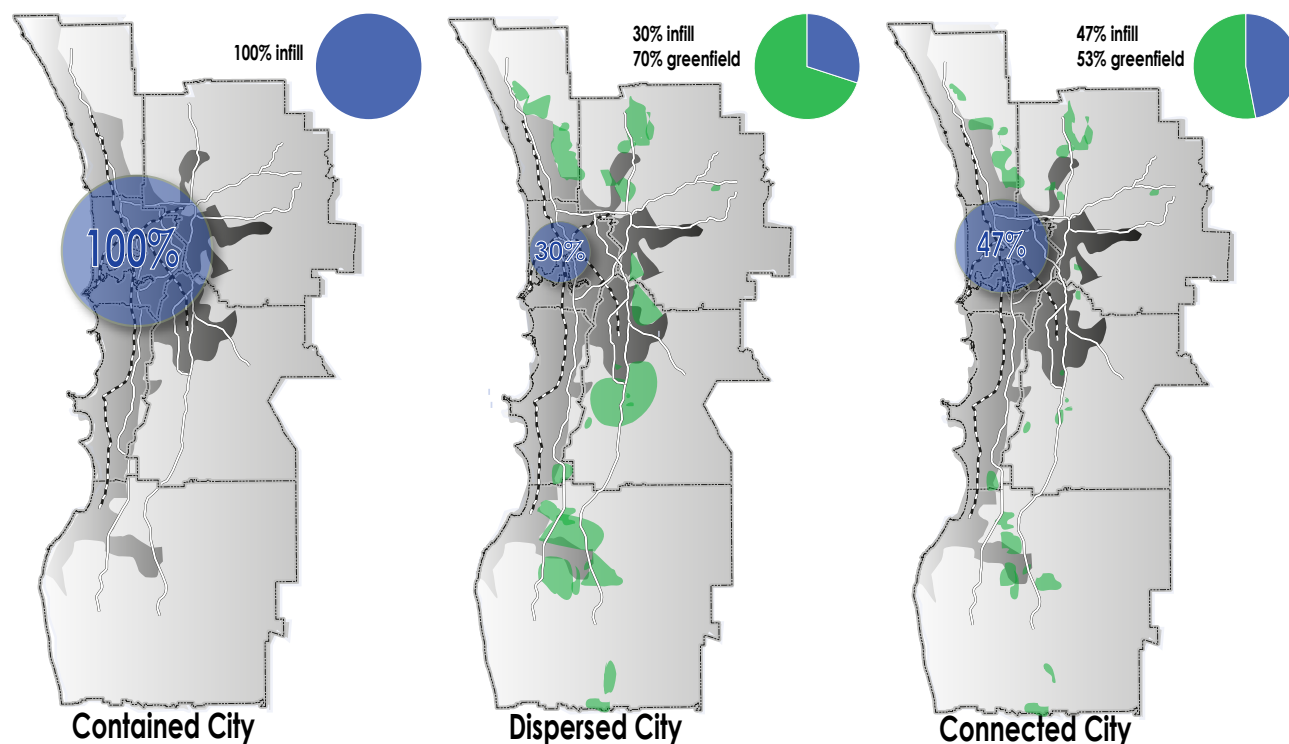


FIGURE 4: A contained city, a dispersed city and a connected city

4.1 A connected city

A connected city was identified within previous strategies such as *Metroplan* in 1990 and *Directions 2031 and Beyond* as the preferred, pragmatic future growth pattern because it provided the best balance between urban infill and fringe development. As a connected city Perth and Peel will increasingly be comprised of:

- a strong central business district that is the business, finance, service, retail, cultural and entertainment centre of the State;
- a network of connected activity centres which deliver employment, entertainment and higher-density lifestyle choices. These centres will be designed to be attractive, accessible, compact, vibrant, pedestrian and cycling-friendly environments that have high-quality public transport and road linkages;
- connected, specialised centres of innovation, education, health, research and technology which are designed and located to enable access to skilled labour and appropriate infrastructure;
- urban areas that deliver a range of contemporary lifestyle choices from low- density suburban, to medium-density urban and high-density inner city lifestyles in strategic localities;
- high-quality global and local infrastructure networks including roads, public transport, energy, water, communication and globally competitive, highly accessible airport and sea port infrastructure;
- well-designed urban form that maximises the use of existing infrastructure assets in parallel with extending infrastructure into the development areas of the outer sub-regions identified in the relevant frameworks; and
- integrated land and water management policies and processes that provides social amenity, environmental protection and resilience to climate change (including water supplies) for a more liveable city into the future, through better urban water management, water sensitive urban design and green infrastructure.



4.2 Urban v suburban

A 2013 survey commissioned by the Western Australian Planning Commission with the then departments of Planning and Housing into housing choices showed affordability drives housing decisions for all but the highest income earners.

It also indicated that a clear majority of people – 67 per cent – would prefer to live in the Central sub-region but that only half this number could afford to choose this location due to financial considerations. All indications are that this demand will continue to increase.

The cost of renting remains the biggest weekly expense for low-income households and housing costs remain the biggest single driver of financial hardship for low-income households.

Approximately 800,000 new homes are required to accommodate an additional 1.5 million people. Of these, 380,000 dwellings will be developed predominantly in strategic infill locations to reach the *Directions 2031 and Beyond* infill target of 47 per cent. The overwhelming majority of these – an estimated 215,000 homes – will be built in the Central sub-region and a further 165,000 in the outer sub-regions (Table 1).

Future infill growth will need to make much better use of existing infrastructure and amenities and promote increased density and diversity of mixed-use development. In particular, turning key transport corridors into multi-functional corridors is crucial in the development of a more compact urban form.

A fundamental consideration will be to minimise the impact on existing suburbs and to retain their character and amenity by:

- identifying the most appropriate areas where urban consolidation could occur (such as activity centres, public transport corridors, station precincts);
- ensuring these areas have access to existing and future public transport routes; and
- protecting the green network – parks, rivers, beaches, wetlands – and potential linkages between these areas.

Good design is a crucial element in the successful implementation of increased infill development. The second phase of Western Australia's ongoing planning reform

TABLE 1: Sub-regional infill development targets (dwellings)

Sub-region	2011–16	2016–21	2021–26	2026–31	Total 2031	Post-2031	Total infill (2050)
Central	40,170	29,380	29,890	25,440	124,880	88,250	213,130
North-West	10,190	7,050	6,700	4,530	28,470	20,120	48,590
North-East	6,980	7,720	4,960	3,720	23,380	16,520	39,900
South Metropolitan Peel	13,580	11,360	10,535	8,765	44,230	31,280	75,510
TOTAL	70,920	55,510	52,085	42,455	220,960	156,170	377,130



4.3

Key planning framework principles

agenda includes recommendations to improve aspects of design and development, actioned through the Western Australian Planning Commission's draft *Design WA* initiative, released for public comment in late 2016.

The remaining 420,000 new homes will be built in areas designated as suitable for development in the outer sub-regions, based on proximity to employment and services, protection of major environmental assets and capacity for efficient provision of infrastructure and essential services, providing a wide range of choices to future home buyers.

Based on existing development trends, there is sufficient capacity in the proposed consolidated urban form to meet the anticipated demand for additional dwellings beyond 2050. Opportunities for urban development post-2050 will need to be investigated. In addition to servicing and infrastructure requirements, future urban land use investigations will need to ensure that the land forms part of a logical expansion/extension to the existing urban area, and continues to deliver a consolidated urban form.

If changes are made and *Directions 2031 and Beyond* infill and greenfield density targets are achieved, then the current stock of land could extend beyond 2070.

The following key planning principles have been fundamental to the development of the frameworks culminating in a multi-faceted planning response to avoid, protect and mitigate 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 adverse impact on people, property and infrastructure.
- Limited support for new rural residential development, with the emphasis on areas currently zoned for that purpose.
- Facilitate increasing the number of people living close to where they work with the identification of suitable sites for employment within sub-regions, with a focus on attracting strategic economic and employment land use to the sub-regions.
- 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, 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 changing 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 conversation 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 strategic staging and sequencing of development.
- Retain land for agriculture and food production.

It should be noted that the frameworks are strategic planning documents and as such, do not change existing statutory region or local planning scheme zonings or reservations. These changes will be achieved through formal amendment processes. The frameworks are a first step in the ongoing process of refining and detailing planning proposals to adapt to changing community needs.

4.4 Urban consolidation principles

Infill development within established urban areas will contribute significantly to housing diversity and choice and provide opportunities for more affordable living within vibrant, connected and revitalised neighbourhoods.



The 10 urban consolidation principles that guide infill development are:

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 is 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 service and social 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, sport/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 the risk of inundation from sea-level rise, flooding, storm surge events and bushfire damage.

4.5 Delivering a connected city

Planning for 3.5 million people requires the most efficient use of transport networks, service infrastructure, employment land and key community/social infrastructure facilities. This will result in the majority of the population located within reasonable proximity of a wide range of services and activities, with high-quality built form, public spaces and extensive local green networks.

Strategic metropolitan centres provide regional level services and facilities, serving population catchments of up to 300,000 people and are the key element of the network of activity centres. Focusing on opportunities to capitalise on existing and proposed infrastructure within these hubs will create a catalyst to deliver a greater mix of land uses, employment opportunities and housing choice and diversity. Access to the sub-regions' strategic metropolitan centres will become increasingly important into the future.

The frameworks seek to optimise the use of land in close proximity 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.

The frameworks provide detailed land use strategies and actions required to develop the Perth and Peel regions as a connected city.

Key stakeholders and the wider community were provided with the opportunity to contribute towards the development of the final frameworks.

The draft frameworks were released for a three-month public consultation period in 2015. A second round of targeted consultation was offered to key stakeholders; numerous site visits were made and the Western Australian Planning Commission heard more than 100 deputations from individuals and organisations on specific sub-regional proposals within the draft frameworks.

More than 1,100 submissions were received. All submissions were considered in the development of the final frameworks. 70 per cent of all submissions were received from individuals or groups of individuals who identified as landowners with a further 17 per cent from the general public. Generally, these submissions focused on the proposed classification of individual, regionally-specific land and for the most part, requested the inclusion of sites into areas to be considered for 'urban expansion/investigation' within the sub-regional frameworks.

Finalising the frameworks was guided by an extensive review of documents previously released and/or approved by the Western Australian Planning Commission and informed through secondary consultation with key stakeholders including State and local government agencies. In addition, consideration was given to a number of important initiatives:

- long-term transport planning for the Perth and Peel regions to provide a network of strategic roads 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
- the *Future State Administered Roads Project* (Main Roads Western Australia) which is a review of future State road classifications
- *Future Perth Airports Technical Study* (Department of Planning, Lands and Heritage in conjunction with Department of Transport), which investigates potential sites for a new aviation facility to serve the Perth and Peel regions
- review of *State Planning Policy 2.2 Gnamangara Groundwater Protection* (Department of Planning, Lands and Heritage and Department of Water and Environmental Regulation)

- 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
- review of *State Planning Policy 2.4 Basic Raw Materials* (Department of Planning, Lands and Heritage), which includes a review of basic raw material mapping
- *Perth and Peel Regions Water Supply Strategy* (Department of Water and Environmental Regulation) to identify demand gaps, viable alternative supply options and provide direction for future sub-regional planning.

This work determined the defining key principles that underpinned the proposals contained within the draft frameworks and informed the development of the spatial plan to guide future urban growth patterns. Submissions were considered against these core principles:

- achieving a consolidated urban form
- identifying sufficient land for housing and jobs, along with its timely provision
- protecting employment land from competing land uses
- redressing the balance between greenfield and infill development
- increasing the number of people living close to where they work

- providing effective and sustainable management of water resources
- avoiding/protecting environmental and biodiversity attributes and areas that will provide basic raw materials
- maximising the use of existing and future infrastructure, particularly through shared infrastructure corridors to accommodate 3.5 million people by 2050.

Various issues and proposals raised within submissions underwent a strategic comparative analysis and were tested against a range of social, economic and environmental factors. Some submissions were accompanied by environmental reports and/or legal opinions to support requests for (or against) land use reclassification. A number of these that related to environmental issues were reviewed independently against a range of State and Commonwealth environmental criteria.

Submissions from all groups - State and local governments, industry bodies and individual submitters - largely supported the concept of developing strategic land use and infrastructure documents to guide future development of the Perth and Peel regions to 2050.

There was also strong general support for the strategic planning framework and key objectives (liveable, prosperous, connected,

sustainable and collaborative) that underpin *Perth and Peel@3.5million*. In particular, many submitters welcomed the idea of a connected city and the efforts to redress the balance of greenfield and infill development.

The frameworks identify suitable locations for sustainable new urban development (greenfield), including residential, commercial and industrial development, and social and physical infrastructure. They seek to protect key areas of environmental quality and avoid or minimise the negative impacts of urban growth while maximising the public benefits of available land and infrastructure.

The frameworks demonstrate where development could be located to help achieve the target of 47 per cent infill target and promote the connectivity and further development of activity centres, corridors, industrial nodes and station precincts to support the growth of diverse residential and employment opportunities beyond the central business district.

The frameworks also include Planning Investigation areas that require a range of key planning considerations to determine whether any possible change from the current zoning of the sites could be supported.

4.6. Achieving the vision

Drawing on the shared key principles from Perth's previous spatial planning documents, the frameworks set out urban growth proposals to:

- achieve a more consolidated urban form for development within the sub-regions
- meet long-term, diverse housing needs
- 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 requirements such as those required for health and tertiary education
- facilitate and support future regional transportation networks and facilitate the provision of service infrastructure
- identify sites to meet the growing requirement for regional sport and recreation facilities
- protect areas with regional conservation, biodiversity and landscape values
- ensure the green network contributes towards an active and healthy community
- encourage and guide increased connectivity between areas of conservation, open space and urban forest to support ecological systems
- 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
- guide the staging and sequencing for future urban development.



The frameworks' overarching objectives are:

Consolidated urban form

To create sustainable communities that are attractive places to live and work. The consolidation of urban areas 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.

Economy and employment

To promote employment opportunities and increase the number of people who live and work within the sub-regions, 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.

Community and social infrastructure

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, sport and recreation, while promoting co-location and optimising the use of existing facilities and infrastructure.

Movement and access

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-regions to the greater Perth and Peel regions, as well as the south-west of the State and the Wheatbelt.

Service infrastructure

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

Environment and landscape

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

Natural resources

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



4.7 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.

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

The spatial plan for the Perth and Peel regions (Figure 5) has been developed to deliver a more consolidated urban form and achieve a more efficient and cost-effective urban structure that minimises environmental impacts.

The 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 legislation.

It has been prepared through a whole-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;



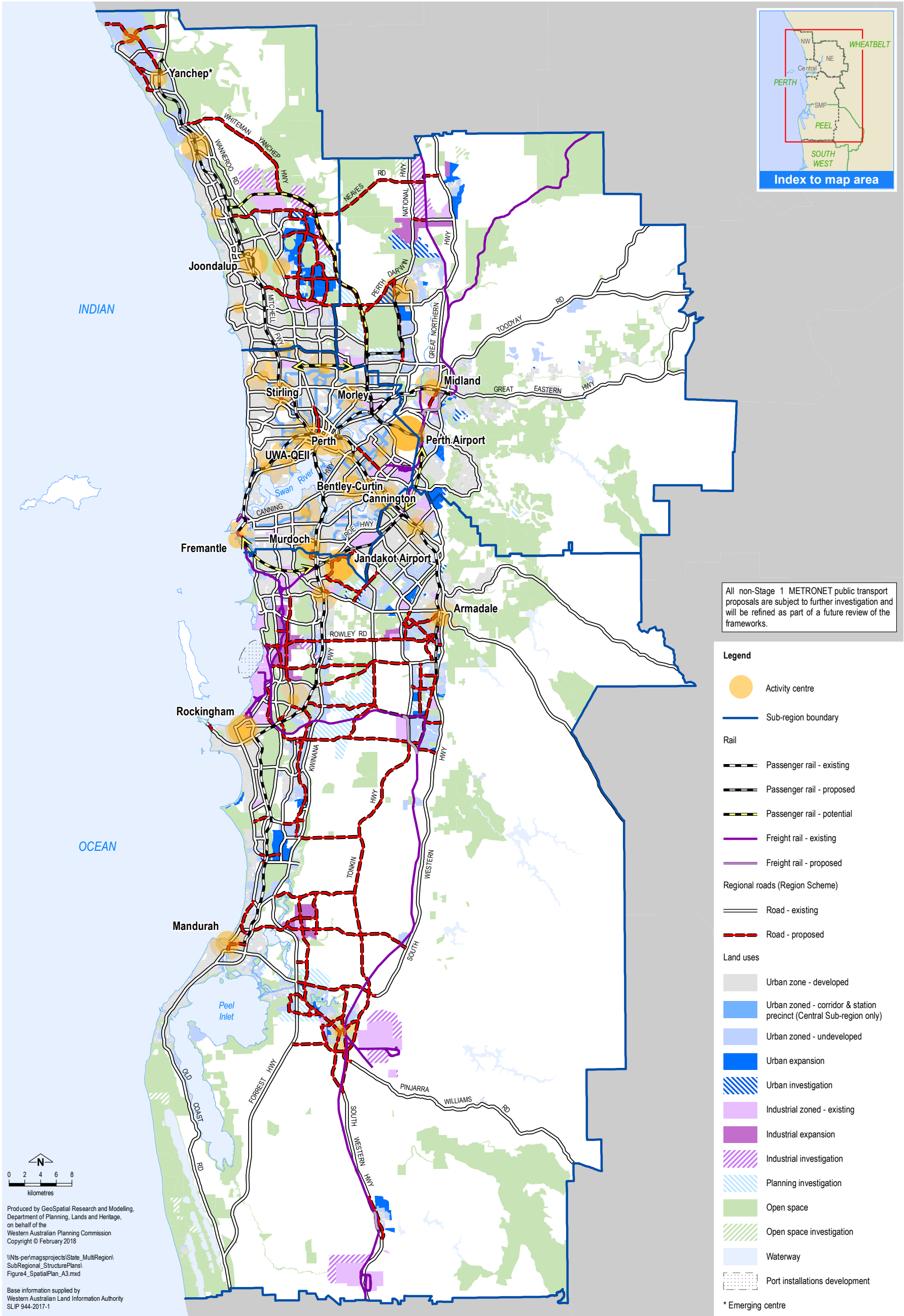


FIGURE 5: Perth and Peel@3.5million – spatial plan

- the expectation that servicing agencies will work collaboratively to maximise future shared infrastructure corridors and sites;
- 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;
- a review of land requirements for economic and employment opportunities;
- an examination of the capacity of regional infrastructure to economically service future growth;

- 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:

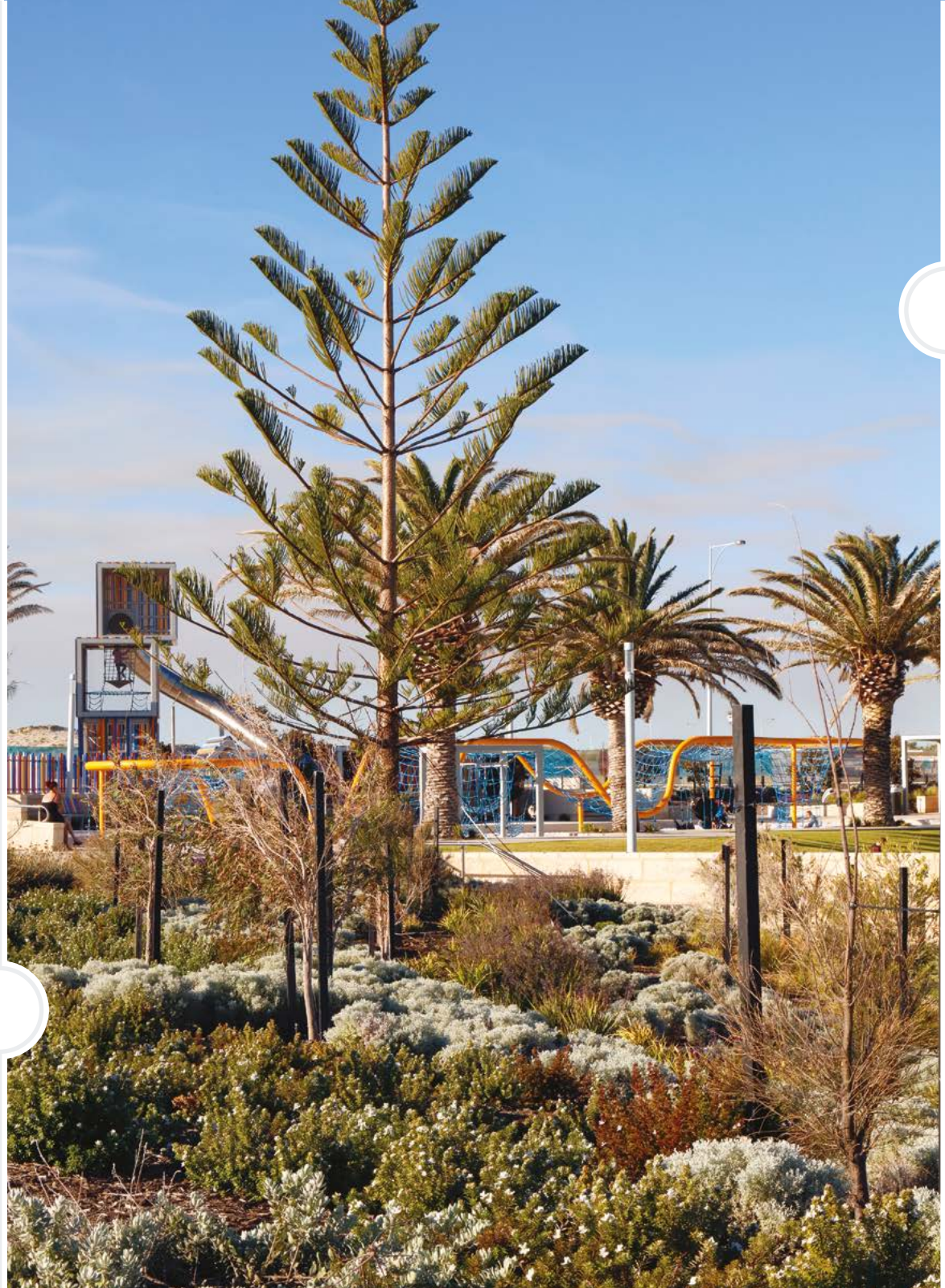
- recognise existing regional open space areas and identify those that will be required in the future;
- avoid development within regionally significant vegetation locations including wetlands and other high value environmental areas;
- protect regionally-significant landscape values;
- safeguard high-priority 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.

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.





PEOPLE AND SOCIETY

Western Australians are becoming more demographically diverse, better educated and more globally connected than ever before



Perth and Peel's anticipated 2050 population of 3.5 million people will make up more than 75 per cent of Western Australia's total population.

This substantial influx will consolidate the role of the Perth and Peel regions as the centre of employment, lifestyle, health, education and opportunity in the State. However, Perth and Peel at 3.5 million people will not just be bigger; over the next 35 years the continued evolution of society and culture will inevitably change the make-up of our community and households.

Population, demographic and societal trends today provide a glimpse into the lives of the Perth and Peel community in the future. Western Australians are becoming more demographically diverse, better educated and more globally connected than ever before.

These trends are likely to continue, influencing the way people live and work, the recreation choices they make and the services they need.

5.1 Cultural diversity

Migration has made a strong and positive contribution to the Perth and Peel regions' continued prosperity. Western Australia is home to people from more than 190 countries, speaking around 270 languages (including some 50 Aboriginal and Torres Strait languages) and following 130 religious faiths.

The number of Western Australians born overseas has reached almost a third of the total population with 15 per cent speaking a language other than English at home.

Over the past few decades, there has been a shift from family migration, which made up 79 per cent of all migration to Western Australia in the 1980s, to skilled migration which makes up 69 per cent of today's migration intake into the State.



5.2

Demographic diversity

Household composition is changing. Nationally, one-person households are projected to increase to 3.2 million or 28 per cent of all households by 2031, the fastest projected increase of all household types.

Our population is also ageing. In 2015, around 13 per cent of people in Perth and Peel were aged over 65; this is expected to rise to 22 per cent by 2051 with the forecast average increase in life expectancy for all Australians at six years (84.2 years for males and 87.7 years for females).

Australia's ageing population is a major challenge for all capital cities. As a result, there is growing demand for housing choices in areas with convenient access to a range of services (particularly community and health) or for different styles of housing (for example, smaller dwellings which are easier to maintain) so that people can downsize from the traditional three or four-bedroom home but remain in the same suburb.

Couples without children are projected to be the largest and fastest-growing family type throughout Australia. Two-person households are expected to soon outnumber couples with children. Young adults are living at home longer.

As the composition of the population changes, planning must respond by anticipating the evolving needs and making provision for different types of housing in terms of size, type and location of homes. For example, with the rise in the number of single person households, there will likely be greater demand for smaller dwellings in areas with high levels of social infrastructure and amenity.



5.3 Population density

Perth and Peel's population density is particularly low, providing significant scope to accommodate an increase in population (Figure 6).

In 2011 Perth and Peel recorded an average population density of 269 people per square kilometre.

By comparison, the average population density for Melbourne was 400 people per square kilometre, while Adelaide and Sydney had 376 and 355 people per square kilometre respectively.

London has an average population density of 5,227 people per square kilometre.

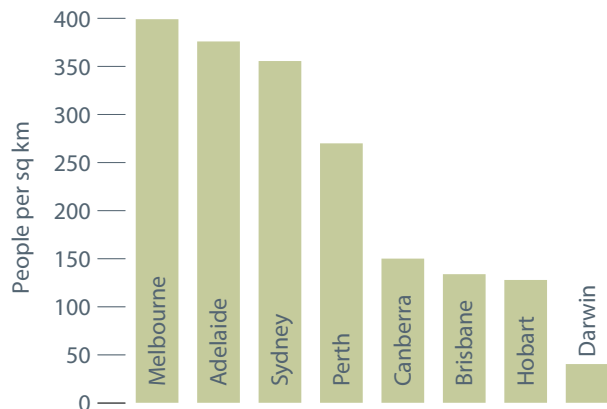


FIGURE 6: Population density across capital cities

5.4 Population growth

The population of Perth and Peel in 2016 exceeded two million people. Modelling carried out on behalf of the Western Australian Planning Commission examined future population projections across the four sub-regions. These projections anticipate a continuation of the ageing population and diversity of household demographic. Figure 7 provides an indication of comparative growth across all sub-regions from 2011 to 2050.

Central sub-region: this covers the cities of Bayswater, Belmont, Perth, Stirling, South Perth, Subiaco, Melville, Nedlands, Canning, Fremantle, and the towns of Bassendean, Cambridge, Claremont, Cottesloe, East Fremantle, Vincent, Victoria Park, Mosman Park, and

the Shire of Peppermint Grove. In 2011 it had a population of 782,990 people, or 42.6 per cent of the total regional population and the slowest population growth of just 1.5 per cent. More than half of all residents live in the cities of Stirling, Melville and Canning.

While it is likely to remain the most populous sub-region, its population share will continue to decline to 32.5 per cent in 2050. Its population is expected to grow by more than 468,000 people to 2050, bringing it over 1.2 million people.

North-West sub-region: this covers the cities of Joondalup and Wanneroo. In 2011 it had a population of 322,490 people or 17.5 per cent of the total regional population. The population is expanding annually by 3 per cent and is anticipated to double by 2050 to 740,330 people.

Currently, the population is relatively evenly distributed between Joondalup and Wanneroo; however Wanneroo's availability of urban zoned land will see it become home to almost three quarters of the sub-region's population.

North-East sub-region: this covers the cities of Swan and Kalamunda and the Shire of Mundaring. In 2011 it had a population of 209,150 people or 11 per cent of the total regional population and growing at 2 per

cent annually. More than half live within the City of Swan, followed by Kalamunda and Mundaring respectively.

It is expected to continue relatively strong population growth, influenced by affordable housing, employment opportunities and semi-rural and 'hills' lifestyles. Its population base is expected to more than double to 450,580 by 2050, predominantly within the City of Swan, which will accommodate 60 per cent of residents.

South Metropolitan Peel

sub-region: this sub-region will experience strong growth, with the population expected to more than double from 523,400 people in 2011 to 1.26 million by 2050. Significant future development will occur on land already zoned as urban, including between Kwinana-Rockingham and Mandurah-Pinjarra.

The Peel sector covers the City of Mandurah and the shires of Murray and Waroona. In 2011 it had a population of 91,930 people, or 5 per cent of the total regional population. With an average population growth rate of 3.8 per cent, it recorded the strongest growth of all sub-regions.

The South Metropolitan sub-region is divided into the south-west and south-east sectors.

The south-west sector, covering the cities of Rockingham and Cockburn and the Town of Kwinana had an estimated population of 235,160 people in 2011, or 12.8 per cent of the regional population and with an average annual growth rate of 2.3 per cent.

The south-east sector had an estimated population of 196,340 people in 2011, or 10.7 per cent of the total regional population. More than half of all residents lived within the City of Gosnells and with much of the remainder living within the City of Armadale and also the Shire of Serpentine-Jarrahdale.

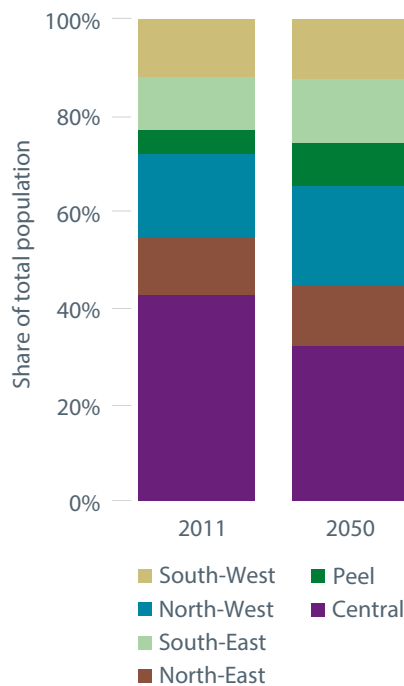


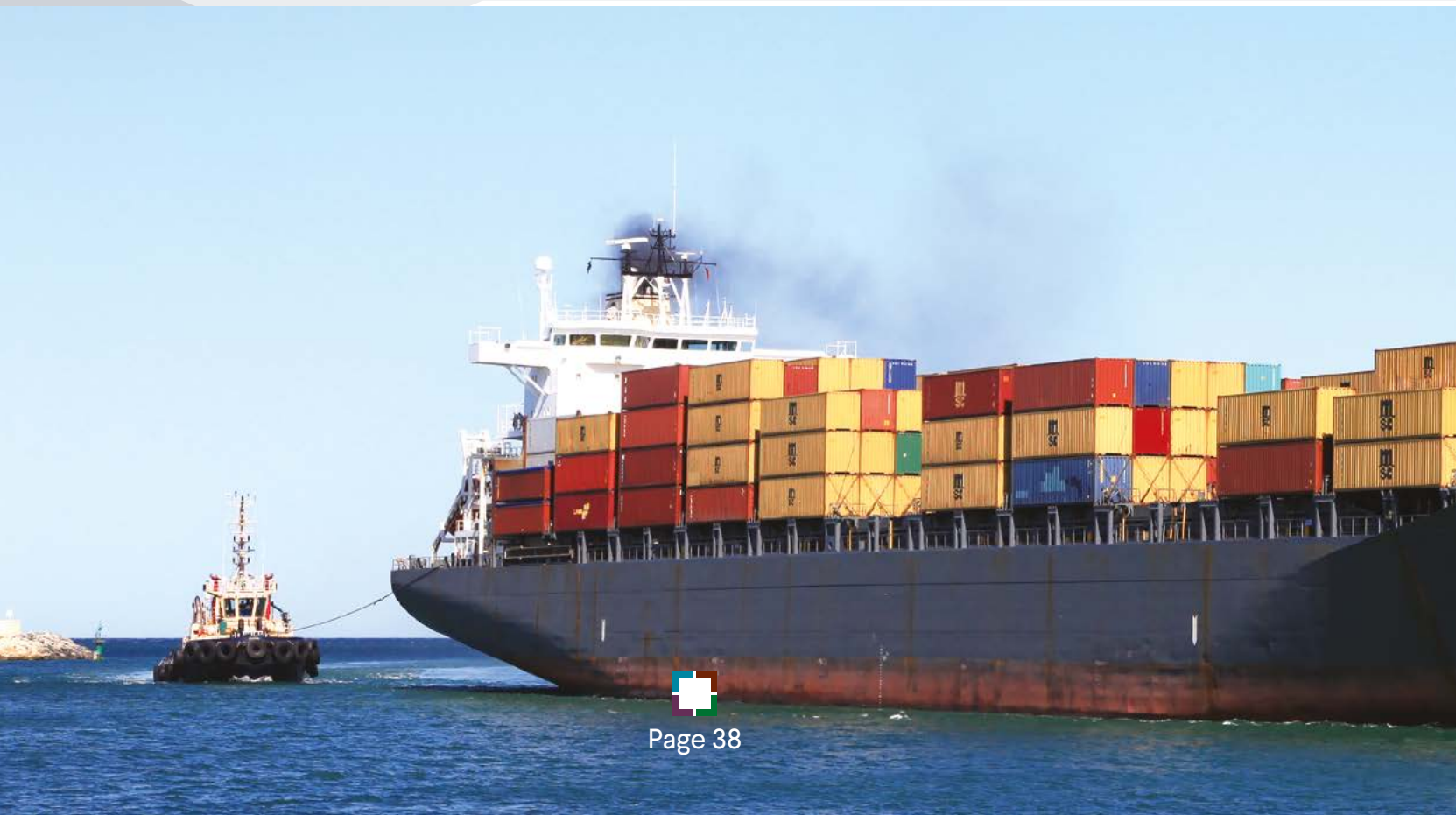
FIGURE 7: Sub-regional population growth 2011 and 2050





ECONOMY

The city has evolved from a geographically-isolated and inward-focussed community to a strong, connected city with increasing global significance



Over the past 40 years, Australia has progressively opened its market to trade and foreign investment, reformed the financial sector, increased competition for goods and services and improved flexibility and productivity in the labour market.

This has placed the nation in a strong position to benefit from an increasingly integrated economy by establishing new trading partnerships.

Given its trade-based economy, Western Australia has largely benefitted from globalisation which has seen a strong business relationship forged with China; reinforced our robust economic ties with traditional markets such as Japan; and increased our connections with new trading partners across Asia and around

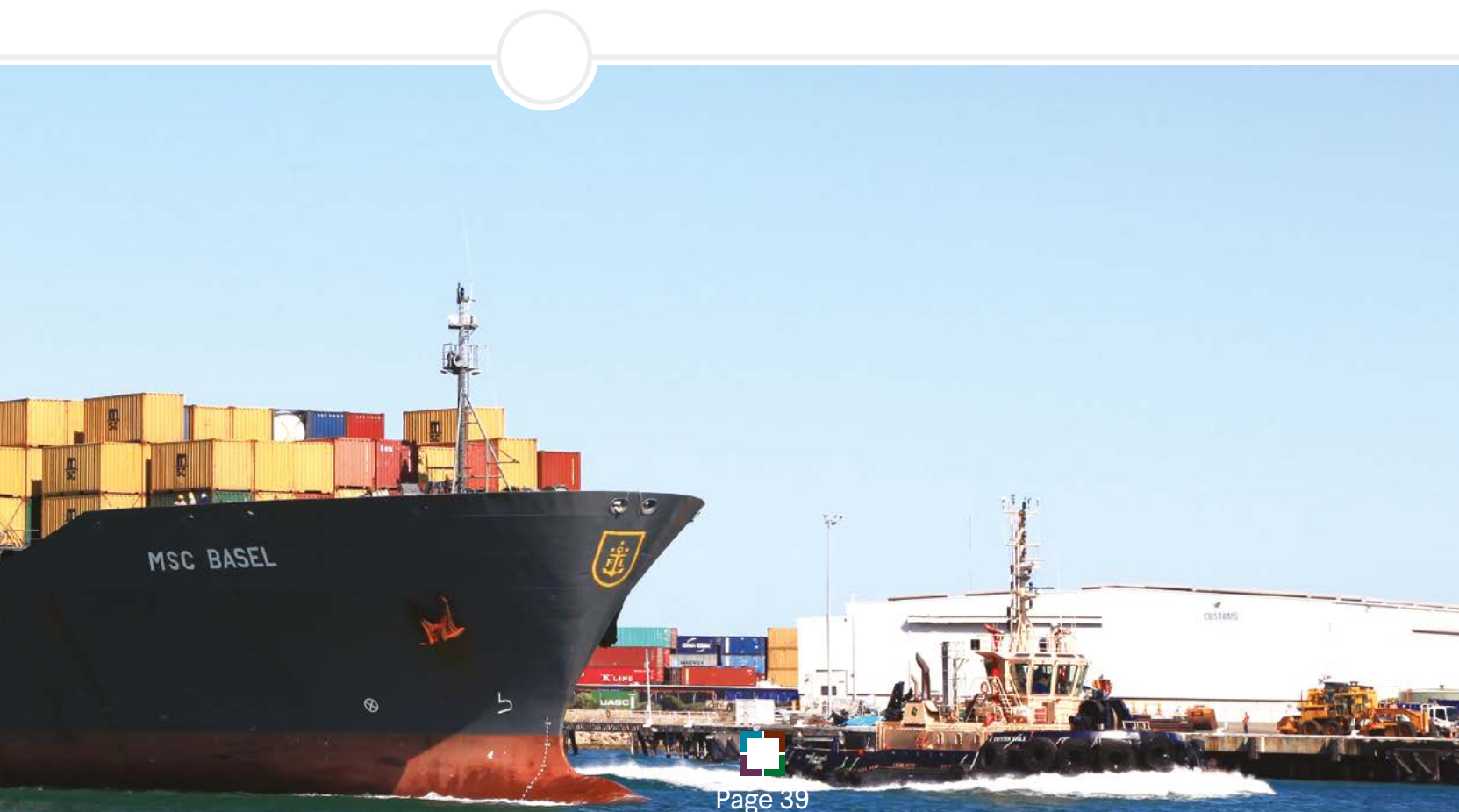
the Indian Ocean rim. The competitiveness of agriculture, manufacturing, tourism, education and other service industries has also increased.

Long sustained by a strong agricultural and resources-related economy, the future prosperity of Perth and Peel will depend largely on an ability to maintain and expand this role, particularly with the strong, growing economies of the Asian region but also through a potential to diversify and respond quickly to changing global, national and domestic needs.

A connected city will enable more effective use of urban and employment-generating industrial and commercial land to accommodate sustainable population growth across Perth and Peel.

As the global economy becomes more integrated, cities around the world are taking on new and critical roles as centres of productive, specialised and knowledge-intensive industries and services.

Over the past 80 years – since the first phone line connected Perth to Adelaide in the 1930s – technology has transformed Perth's global connectivity. The city has evolved from a geographically-isolated and inward-focussed community to a strong, connected city with increasing global significance. Technology will be pivotal in enabling an innovative, globally-competitive and sustainable future for the Perth and Peel regions.



Globally, advances in Information and Communications Technology (ICT) have already changed the way that people work by enabling more to work remotely from their primary place of employment. It is estimated that up to a quarter of Australia's workforce work some hours at home as part of their main job.

Greater global connectivity, ongoing development of ICT and a shift in employment requirements are expected to further increase the capacity for tele-working and tele-service delivery. There is significant potential for services such as health and education to be delivered remotely, increasing efficiency and accessibility and reducing the need for travel.

Activity and industrial centres make up the key features of the Perth and Peel economy, with key employment areas including:

- Perth's central business district
- heavy industrial sites including Western Trade Coast, Kwinana Industrial Area, Rockingham Industrial Zone
- Pinjarra and Wagerup
- industrial and intermodal terminal at Kewdale-Hazelmere
- Fremantle Port.

Each sub-region has a hierarchy of strategic metropolitan, secondary and district centres, providing goods and services to the population and contributing to the economy. The Central sub-region also has the Perth CBD, West Perth, Northbridge and East Perth.

Within the sub-regions the central focus will be on strategic metropolitan centres for employment. These are expected to service substantial populations, providing health, community and social services, integrated with public transport and opportunities for an agglomeration of uses.

Industrial centres within Perth and Peel are generally associated with employment infrastructure, including port, airports and intermodal terminals offering great accessibility to markets. Heavy industrial land is located within the South Metropolitan Peel sub-region, including the Western Trade Coast (comprising the Australian Marine Complex, Kwinana Industrial Area, Latitude 32 Industrial Area and the Rockingham Industrial Zone) Pinjarra and Wagerup.

The Western Trade Coast is the only Strategic Industrial Area (SIA) in the Perth and Peel regions. This and other regional SIAs are of significant economic and strategic importance to the State and are protected through buffers or industry protection areas from urban encroachment and sensitive land uses.

Industry protection areas protect industry from urban encroachment and sensitive land uses providing industry with much-needed long-term certainty and stability for investment and business development decisions. Industry protection areas also protect sensitive land users into the future from potential impacts of industry, including reduced air quality, risk, noise, odour and amenity. These areas can accommodate a transition of non-sensitive land uses that are compatible with the heavy industry uses in the core of the SIA such as general industrial and commercial uses.



Heavy industry is generally associated with the State's resources, including oil refining and processing; fabrication and construction through to large scale processing operations such as alumina, nickel, titanium. The South Metropolitan Peel sub-region is serviced by deep-water port facilities and has access to regional road and rail network.

Projected growth through to 2050 indicates that the existing employment infrastructure will need to expand, with a second port being considered. Any new infrastructure represents an opportunity for synergies with the existing port operations and Australian Marine Complex, building upon a network of employment opportunities and infrastructure.

To build a prosperous economy, improved utilisation through access to existing and proposed transportation infrastructure is essential, particularly within activity centres such as Joondalup.

For sub-regions with lower employment self-sufficiency, such as the North-West and the South Metropolitan Peel's south-eastern sector, it is critical that employment opportunities focus on key industries that encourage people to live and work within the same sub-region.

Critical to the delivery of employment opportunities is the identification of sufficient land in activity centres and industrial areas, as well as associated infrastructure. Activity centres should have a range of land uses, but should remain employment-focused.

6.1 Workforce profile

The Perth and Peel regions have a relatively diverse range of employment opportunities. The most prominent sectors (2011) were:

- Healthcare and social assistance (11.3 per cent)
- Retail trade (10.8 per cent)
- Construction (9.9 per cent)
- Education and training (9.2 per cent)
- Manufacturing (8.9 per cent)
- Professional, scientific and technical services (8.6 per cent).

Almost a quarter of occupations were classed as professional, followed by clerical and administrative workers and technicians and traders workers.

The workforce across the four sub-regions is expected to almost double from 902,590 in 2011 to 1,789,900 in 2050 (Table 2).

TABLE 2: Labour force by sub-region 2011-2050

Sub-region	2011	2050	Total change	Total % change
Central	390,970	595,660	204,690	52%
North-West	163,640	376,390	212,750	130%
North-East	102,610	224,860	122,250	119%
South Metropolitan Peel	245,370	592,990	347,620	142%

6.2 Future employment

Modelling prepared on behalf of the Western Australian Planning Commission has provided a projected number of jobs across the four sub-regions to 2050. This modelling should be regarded as a guide only and is not intended in any way as an employment target.

The employment base for the Perth and Peel regions is projected to almost double from an estimated 853,000 jobs in 2011 to almost 1.7 million jobs by 2050.

Economic modelling based on the connected city scenario (Figure 8) indicates that jobs growth in key industries in Perth and Peel to 2050 is projected to be:

- 138,000 additional jobs in the healthcare and social assistance services
- 102,000 additional jobs in construction
- 91,000 additional jobs in retail trade
- 77,000 additional jobs in education and training
- 76,000 additional jobs in professional, scientific and technical services.

These job numbers are a projection only and may vary due to a number of factors including changes within the economy and provision of appropriate infrastructure (Table 3).

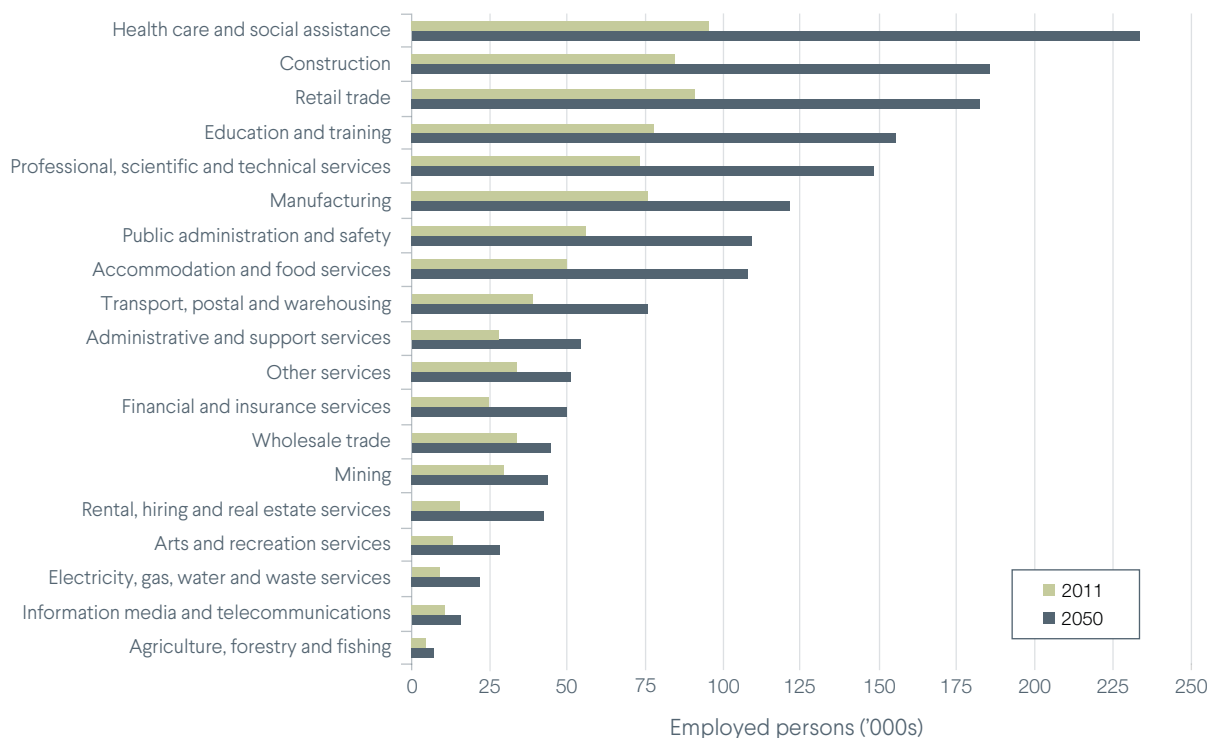


FIGURE 8: Employment by industry 2011 and 2050



TABLE 3: Jobs by sub-region 2011-2050

Sub-region	2011	2050	Total change	Total % change
Central	546,120	831,960	285,840	52%
North-West	80,570	224,130	143,560	178.2%
North-East	82,380	192,950	110,570	134%
South Metropolitan Peel	143,970	437,730	293,750	204%

These projected employment options are clearly influenced by the regions' predicted demography, and in particular, reflect the needs of an ageing population with substantially greater demand for healthcare and social assistance services.

The frameworks identify locations with potential for expanding existing industry and commerce. Future development will require readily-available, adequate land and services to accommodate this, focussed mainly around identified activity centres across all sub-regions.

Central sub-region: This region is the leading employment centre in Perth and Peel, providing just over 546,120 jobs in 2011. It is expected to rise to 831,960 jobs by 2050. Professional, scientific and technical services and healthcare and social assistance opportunities are likely to contribute around a third of additional jobs, followed by education and training.

Development of new major health and education facilities to support the broader Perth and Peel population will fuel jobs growth, with increases in the professional, scientific and technical services industry reflecting the sub-region's central location with ready access to skills and key infrastructure.

North-West sub-region: Jobs are projected to grow steadily from 80,570 in 2011 to 224,130 by 2050 with healthcare and social assistance, retail trade, and education and training projected to contribute approximately 44 per cent.

The growth sectors are likely to have a strong activity centre focus and a ready availability of serviced developable land will be needed at population growth areas, particularly the Yanchep Strategic Metropolitan Centre and Alkimos and Two Rocks North Secondary Centres.

North-East sub-region:

Employment is projected to grow from 82,380 jobs in 2011 to more than 192,950 by 2050 with construction, healthcare and social assistance, manufacturing, and transport, distribution and warehousing, and retail contributing approximately 60 per cent of additional jobs. This is driven by the sub-region's strategic location relative to road and rail freight transport infrastructure, proximity to Perth Airport and increased demand for population-based services.

The growth sectors are likely to focus on Midland as the key employment centre, in Ellenbrook as further population expansion occurs, around Perth Airport, in the industrial centres at Malaga, Forrestfield and Hazelmere and in attractors such as the Swan Valley and the Avon Valley. A ready availability of land will be needed within these key activity centres and industrial centres.

South Metropolitan Peel

sub-region: In 2011, the sub-region generated a total of 143,970 jobs, estimated to rise to 437,730 by 2050. Employment opportunities are expected to focus on manufacturing, construction, retail, healthcare and social assistance.

Jobs in the south west sector are projected to reach 195,115; 137,030 in the south east sector and 105,580 in the Peel sector by 2050. The key growth locations identified within the framework include the Western Trade Coast including the Australian Marine Complex, the Latitude 32 industrial area and a future industrial area at Nambeelup.



6.3 Employment self-sufficiency

A strong population growth and the need to commute to other areas – particularly the CBD – for work have placed significant pressure on the transport network so providing greater employment opportunities close to where people live – employment self-sufficiency – is a key strategic focus of the frameworks.

Employment self-sufficiency reduces the need for long and costly commutes and increases the economic sustainability of individual sub-regions. This will be achieved through better integration of land use planning and the movement networks, particularly around activity centres and station precincts.

Improving employment self-sufficiency across the Perth and Peel regions will require the creation of employment opportunities that match the skill sets of the various labour forces.

Employment self-sufficiency is projected to improve most strongly in the South Metropolitan Peel and North-West sub-regions, with little or no change in the North-East and Central sub-regions from 2011 to 2050 (Table 4).

TABLE 4: Employment self-sufficiency by sub-region 2011-2050

Sub-region	2011	2050	Total change
Central	139.7%	139.7%	0%
North-West	49.2%	59.5%	10.3%
North-East	80.3%	85.8%	5.5%
South Metropolitan Peel	59%	74%	15%



6.4 Employment land

The Perth and Peel regions have sufficient employment-generating industrial land to accommodate future demand to support jobs growth and to enhance sub-regional employment self-sufficiency, through to 2050.

Strategic industrial centres – with a focus on heavy manufacturing, processing, fabrication and overseas export – include Western Trade Coast, Wagerup, Pinjarra and Kewdale/Welshpool. A further 32 existing industrial centres are located across all sub-regions.

Central sub-region: Existing industrial centres include Canning Vale, Myaree, O'Connor and Kewdale/Welshpool. There is limited land available within the sub-region to cater for any future industrial growth as most existing industrial areas are nearing capacity. Future demand for industrial centres will be met mostly by the outer sub-regions. The conflict between competing land uses such as residential and commercial is putting pressure on industrial land with the sub-region.

North-West sub-region: Sufficient identified industrial land is available to meet projected demand of 1,770 hectares, based on anticipated average consumption rates. The framework has identified more than double this amount. Some of this will be met through existing

undeveloped industrial centres and at Wangara, Neerabup and Landsdale. New industrial areas for investigation have been identified for Nowergup, Pinjar and Jandabup.

North-East sub-region: This sub-region is projected to experience high demand for land in industrial centres of approximately 2,810 hectares to 2050; there is sufficient industrial land identified to meet the predicted demand. Locations identified for potential future industrial use include at Bullsbrook (incorporating North Ellenbrook), Hazelmere South and Wattle Grove. The potential for a future inter-modal freight terminal at Bullsbrook has been identified and will need to be considered as part of future investigations.

South Metropolitan Peel sub-region: This sub-region is expected to require 5,900 hectares of industrial land to 2050 with the Kwinana Industrial Area, the Rockingham Industrial Zone, the Australian Marine Complex and the Latitude 32 industrial area accounting for the majority of this demand. The establishment of the Outer Harbour will also provide opportunities, as do the alumina refineries in Pinjarra and Wagerup. Other industrial areas for expansion or establishment will include sites at Nambeelup, Maddington/Kenwick, Pinjarra, Forrestdale and Mundijong.

Staged delivery of infrastructure and public and private sector investment to maximise economic development and employment potential will be critical to the successful development of priority employment lands. This will require a coordinated and collaborative approach to delivery across government and private stakeholders.

Development needs to coordinate with population growth and the release and development of urban cells. This will ensure jobs growth and location coincides with demand to produce enhanced local employment options.

Planning for economic and employment growth will require consideration of existing and emerging competitive advantage, including sub-regional changes in labour specialisation, industry clustering and evolving employment land assets, to attract business and industry to locate in the sub-region without adversely affecting growth elsewhere in the Perth and Peel regions.

6.5 Central Business District

The Central Business District represents the business, finance, lifestyle, service, cultural and entertainment heart of the State.

It is the primary centre of employment in the Perth and Peel region; at the same time, the city centre is becoming home to an increasing number of people due primarily to the availability of more diverse housing types.

The central city area is currently undergoing a rapid transformation with extensive investment in public and private facilities. These include some landmark projects:

- Elizabeth Quay – reconnecting and revitalising the city with the Swan River through a contemporary, mixed-use precinct incorporating residential, commercial and cultural attractions.
- Perth City Link – sinking the Fremantle rail line and the Wellington Street bus station to create more residential, retail, commercial and entertainment opportunities.
- New Museum – an integral part of the Perth Cultural Centre and continuing the central city area's cultural transformation.
- Optus Stadium and sports precinct – a multi-purpose venue capable of hosting AFL, rugby,

soccer, cricket and entertainment events with an initial 60,000 seat capacity.

- METRONET – providing Perth with a world-class public transport system with integrated land use planning.

Future development of the CBD has been captured within the Central framework, as well as the Western Australian Planning Commission's 2013 report *Capital City Planning Framework – a vision for Central Perth* which aims to guide and complement more detailed local planning for central Perth.

6.6 Tourism

Tourism is an important economic and employment growth opportunity. It provides significant employment opportunities across a range of related sectors and supports recreation and leisure options for visitors and residents alike.

Western Australia received more than 10 million overnight visitors during 2015/16. There were approximately 888,000 international visitors during this time contributing \$2.2 billion to the local economy, and some 1.4 million visitors from interstate who spent a total of \$1.3 billion.



6.7 Strategies

The majority of overseas visitors came from the United Kingdom but significant numbers came from China and Singapore. In 2015/16, around 14 million passengers travelled through Perth's domestic and international airports.

Tourism Western Australia publishes a register of significant tourist accommodation development which tracks projects in the planning, construction and completed stages. It monitors the level of tourist accommodation development activity throughout Western Australia for each financial year. Data from the past three years show that there was an increase in tourist accommodation developments.

Further integration of the tourism economy, particularly around waterside activity centres, recreation infrastructure and appropriate natural landscapes should be supported.

The frameworks have identified an economic vision for Perth and Peel as they move towards strong, connected regions with increasing regional and global significance. A multi-faceted approach through close collaboration across government – including local government – and the private sector is required to achieve this vision through:

- encouraging employment opportunities, particularly strategic employment
- encouraging the population to live and work within the same sub-region
- improving the use of existing infrastructure
- encouraging a built form that can accommodate a sense of amenity while also providing for changes in use over time
- encouraging a framework which provides for a range of opportunities and uses to support employment opportunities.

Local economic development strategies, created collaboratively by governments and the private sector will guide the development of a prosperous economy across the Perth and Peel regions through:

- encouraging and facilitating growth for activity and industrial centres to deliver employment opportunities
- protecting employment-generating land from the encroachment of competing land uses
- creating employment opportunities that utilise local labour-force skills to increase employment self-sufficiency by attracting businesses that match the populations that live in the various sub-regions
- maximising and encouraging further growth of an area's key economic sectors
- cultivating and strengthening relationships with key stakeholders
- providing targeted services and support to businesses to facilitate economic growth through mechanisms that could include financial assistance, technological support or clusters of similar developments.

THE URBAN ENVIRONMENT

There is currently enough undeveloped land within the existing spatial plan to accommodate a projected population of 3.5 million people by 2050 – if infill and density targets are met



Perth and Peel's population and spatial plan have more than doubled since the 1970s and the urban area is continuing to expand outwards.

Some 40 years ago, urban growth areas largely within a 20 kilometre radius of the Central Business District, such as Stirling, Melville, Canning and Bayswater, were the principal sites of residential expansion. This resulted in a low-density expansive city with a dominant CBD and set the scene for unsustainable urban sprawl and escalating levels of traffic congestion.

Today, Perth's northern and southern urban fronts sit some 150 kilometres from the CBD. Significantly, almost three quarters of all new urban development occurs in the outer suburbs.

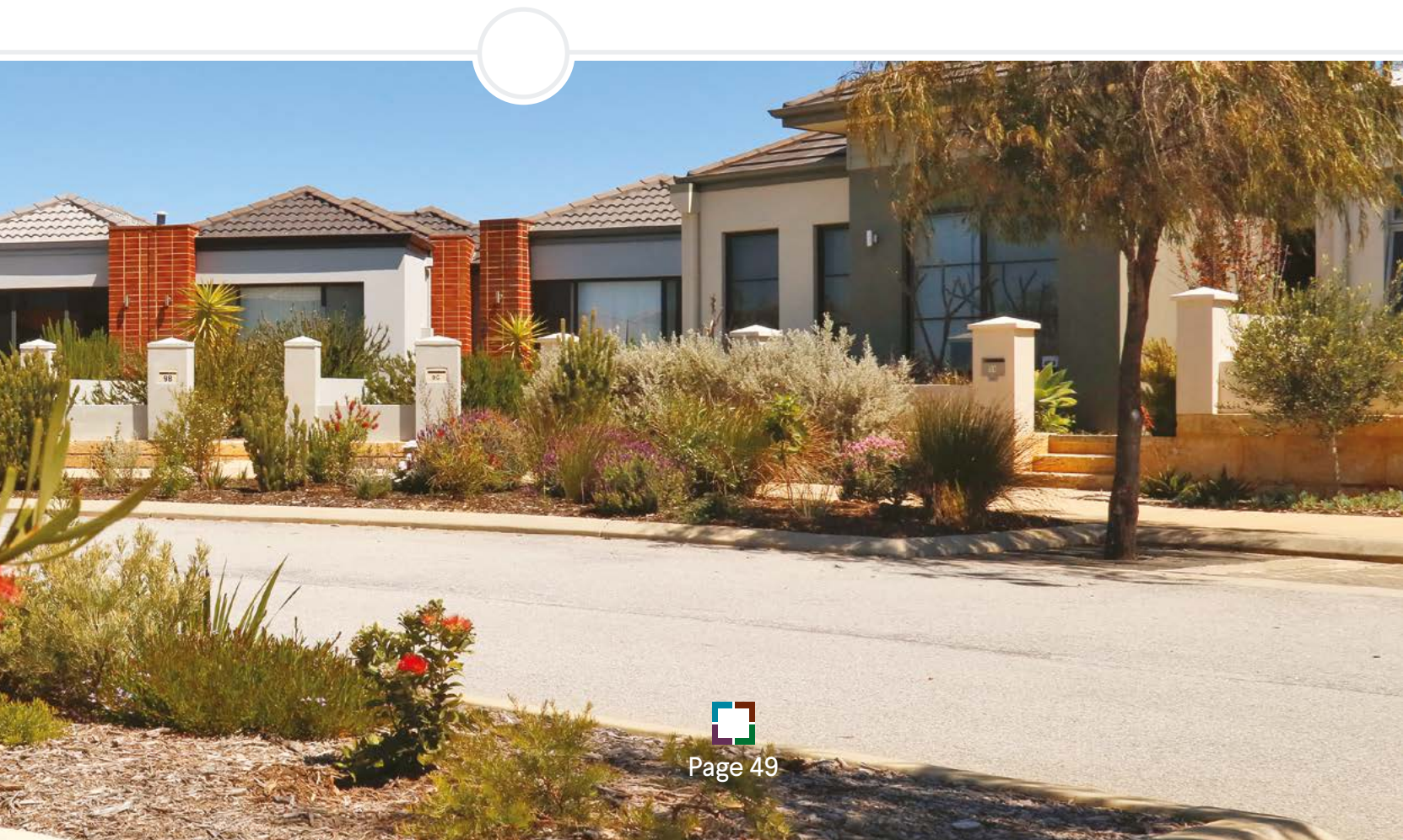
Around 800,000 new homes will be needed across all sub-regions by 2050 to accommodate a growing population. There is currently enough undeveloped land within the existing spatial plan to accommodate this projected population increase – if infill and density targets are met; if Western Australians support greater housing

diversity; and if the outcomes detailed in the frameworks are met (Table 5).

Shifting social needs and preferences coupled with more consolidated development patterns will provide the capacity for a more equitable, sustainable and liveable future.

TABLE 5: Sub-regional dwellings 2011-2050

Sub-region	Existing Dwellings (2011)	Additional Dwellings (2050)	Total
Central	332,470	213,130	545,600
North-West	114,920	168,790	283,710
North-East	76,550	102,560	179,110
South Metropolitan Peel	205,490	302,180	507,670
Total	729,430	786,660	1,516,090



7.1

Housing diversity and affordability

Western Australia has some of the largest average-sized homes in the world, peaking at an average of 245 square metres. The vast majority – 78 per cent – of all Perth homes were detached dwellings, compared with 12 per cent for semi-detached and just 9 per cent for units.

The lack of real housing diversity and choice and the continued dominance of low-density, suburban development are placing both infrastructure and the natural environment under escalating pressure.

Housing affordability is a major consideration that can result in people – particularly young families and first home-buyers – opting to buy more affordable housing in the outer suburbs.

One effective response to the affordability issue is to develop greater housing diversity across the Perth and Peel regions, and work towards shifting public perception that large, low-density, detached homes on the urban fringes are the only effective solution to the ongoing issue of housing affordability. Smaller dwellings like townhouses, apartments and ancillary dwellings (granny flats) tend to be more affordable than larger homes and can provide opportunities for people to live in their preferred sub-region.

The move towards encouraging more small and diverse housing types is supported by the findings of a 2013 study, *The Housing We'd Choose: a study for Perth and Peel*, prepared by the Western Australian Planning Commission and the departments of Housing and Planning.

The vast majority of respondents indicated that location was a primary consideration and that they would prefer to live in the Central sub-region but could not afford to do so. Three-quarters of respondents said that they were prepared to trade off house size or type in order to live in their preferred area.

When comparing the current housing stock to people's financially-constrained housing choices and requirements, there was an over-supply of detached housing and an under-supply of semi-detached housing.

Western Australia's Affordable Housing Strategy 2010-2020: *Opening Doors to Affordable Housing*, the first of its kind in Australia, aimed to deliver at least 20,000 affordable rental and home ownership opportunities to people on low-to-medium incomes by 2020.

This was achieved by June 2015 through new public, private and community partnerships that financed, developed, built and managed a broader range of affordable housing for up to 50,000 people across the State. Planning reform has brought about changes to the State's planning system that complements and supports on-going efforts to increase the supply of affordable housing across Western Australia.



7.2 Heritage

Perth and Peel contain some of the State's oldest urban settlements, with remaining historic buildings and landscapes that need to be preserved for future generations. These heritage places provide a tangible link with the past and can give the community a strong sense of place.

Opportunities exist within urban consolidation areas that contain heritage places to influence new development through existing heritage character. Revitalising heritage areas and adaptive reuse, where it can be achieved, is actively supported by the Heritage Council of Western Australia. Design incentives and bonuses are used to encourage revitalisation of heritage areas, securing their long-term viability into the future through sensitive development and adaptation.

State Planning Policy 3.5 Historic Heritage Conservation sets out the principles of sound and responsible planning for the conservation and protection of Western Australian's historic built heritage place.

7.3 Design

Good design is not a subjective idea: it can be defined and measured. Notions of design quality extend beyond taste, style and appearance to encompass functionality, sustainability, response to context, structural integrity, flexibility in use, and cost efficiency, both during construction and over the life of the building. Most importantly, good design results in an environment that performs well for all users and the broader community.

Good design endeavours to reconcile multiple concurrent and often competing objectives, and outcomes vary according to the circumstances of each site and project. The logic and rigour of the design process of a project may be more important than whether it meets predefined outcomes. This needs to be acknowledged in the conventions and methods for guidance, discussion and evaluation of design in the planning system.

Planning culture has traditionally emphasised compliance with specific standards and metrics, but there is an opportunity for a more collaborative and constructive interaction between applicants and approval agencies. Better design review processes can enable more flexible controls that can promote positive development forms, rather than just defending against negative impacts.

The draft *Design WA* package, a Western Australian Planning Commission initiative resulting from the second phase of planning reforms is an integrated suite of policy measures that will encourage and enable better design outcomes. It was released for public comment in late 2016.

Design WA is a timely and necessary re-examination of the relationship between planning and design. Elevating the status of design considerations in planning policy and procedures will be a significant step towards raising the quality of the built environment and informing community understand and acceptance of greater infill development.

7.4 Activity centres

A network of activity centres will be a key focal point for commercial and social activity and service delivery to residents, as well as a major driver of new jobs located within communities where people live. These residential and employment hubs aim to allow more people to live closer to where they work, reducing the overall distance travelled for work and increasing subregional employment self-sufficiency.

Generally, they provide services, employment and activities for the communities they support and are integrated within the transport network, with particular emphasis on promoting public transport, walking and cycling and reducing the need for car trips.

Some will build on existing infrastructure such as universities and hospitals to leverage community assets into innovative job-creating activity centres.

These activity centres will match quality infill with amenity by creating a village-style mix of open space, housing, workplaces and entertainment venues. The centres play a crucial employment provision role and have access to good quality public transport. The aim is to provide a range of innovative housing options and the creation of a sense of place by providing social and business activities and services. These centres would build on existing infrastructure and be linked to a co-ordinated and integrated transport network to significantly reduce congestion (Figure 9).

Increasing residential development in and around activity centres linked by a robust movement network is key to delivering a connected and sustainable city that is well-placed to accommodate a substantial future population increase.

The *State Planning Policy 4.2 Activity Centres for Perth and Peel*, under review in 2016, defines a hierarchy of centres based on the future importance of each centre from a network perspective and the magnitude of development expected for a centre.

The hierarchy provides a guide for public authorities in preparing long-term capital investment programs and to promote more private investment. The policy provides minimum and desirable residential density targets and mixed-use land use targets for each level of the hierarchy as a guide for planning and development.

The hierarchy includes:

- capital city, which covers Perth, East Perth, West Perth and Northbridge;
- strategic metropolitan centres including Armadale, Cannington, Fremantle, Joondalup, Mandurah, Midland, Morley, Stirling, Rockingham and Yanchep;



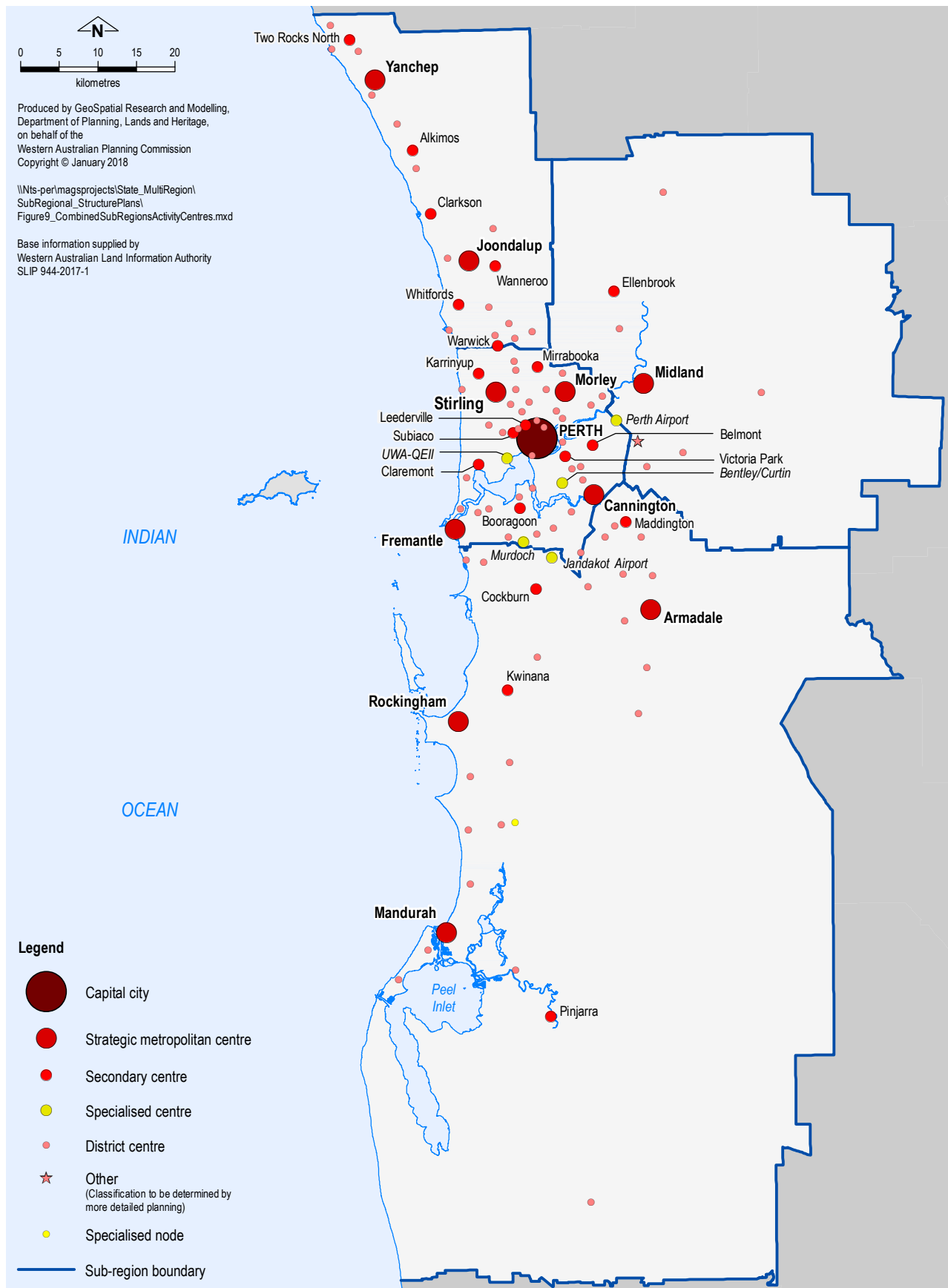


FIGURE 9: Combined sub-regions' activity centres

- specialised centres including Bentley/Curtin, Murdoch, Perth Airport, UWA/QE11 and Jandakot airport;
- secondary centres including Alkimos, Belmont, Booragoon, Claremont, Cockburn, Clarkson, Ellenbrook, Karrinyup, Kwinana, Leederville, Maddington, Mirrabooka, Pinjarra, Subiaco, Two Rocks North, Victoria Park, Wanneroo, Warwick and Whitfords; and
- district centres (predominantly retail-focussed to serve the daily and weekly needs of residents), neighbourhood centres (typically include a supermarket, grouped with a small range of other businesses and some community facilities), and local centres (such as small corner shops, newsagents and delis serving residents within walking distance).

Central sub-region: As the primary importer of workers with 64 per cent of all current jobs, the sub-region presently has 50 activity centres with the capital city at its core. For the most part, its activity centres are linked by a high-quality transport network and there is significant scope for higher residential densities around many of the sub-region's various activity centres.

North-West sub-region: The Joondalup strategic metropolitan centre has been planned and developed as a satellite centre to the CBD, with a number of regional-level services and facilities including a hospital and health campus, university and a major sporting and events arena. Yanchep City Centre is an emerging strategic centre for the northern portion of the sub-region, while the Alkimos Town Centre is an emerging secondary centre that will include a mix of land uses including retail, office, high-density residential development, entertainment and community services for a smaller catchment area.

North-East sub-region: Midland is the long-established strategic metropolitan centre, supported by a strong transport network and servicing a population of 300,000 people. Planning is already underway to significantly revitalise the centre to continue to provide enhanced and diverse employment opportunities, intensified residential densities and infrastructure improvements that will ultimately support increased access to jobs and services.

Ellenbrook is also being progressed as a secondary centre with the potential to accommodate a range of retail, commercial and institutional uses to support the emerging population.

South Metropolitan Peel sub-region: Population growth will increase the importance of the strategic metropolitan centres of Armadale, Rockingham and Mandurah and additional public transport options will enhance the effectiveness of the centres and support further growth and employment opportunities.

Existing secondary centres at Maddington, Cockburn, Pinjarra and Kwinana will continue to serve their surrounding catchments, providing mixed-use residential, retail, commercial and other services. A new specialised activity node at Karnup (East) could provide a range of regional public services which may include education, health and other ancillary uses.



7.5 Future urban form

A fundamental objective of the frameworks is to create sustainable communities that are attractive places to live and work through the consolidation of urban areas and more efficient use of urban land and infrastructure.

Much of this will be achieved through increased urban infill development, higher densities in underdeveloped areas already zoned for urban use and limited additional greenfield development. 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.

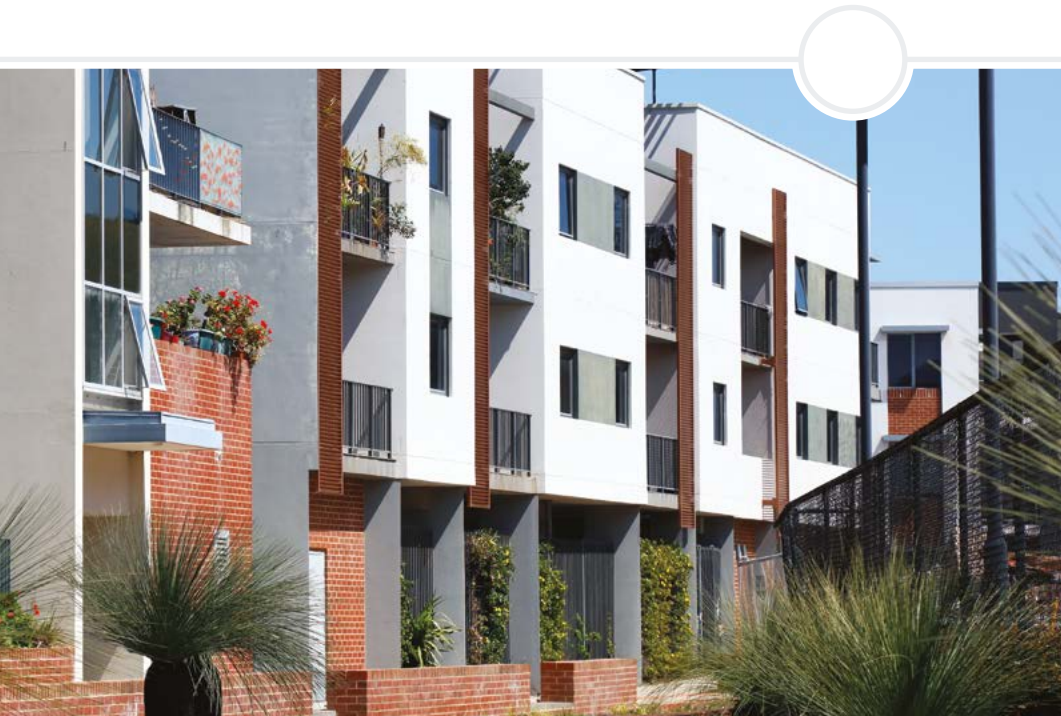
The frameworks seek to optimise the use of land in close proximity to existing transport infrastructure and key centres of activity and community amenity. To achieve this, a focus for both infill and new urban areas will be the development and evolution of new and existing activity centres into vibrant,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

Urban Expansion and Investigation areas have been identified across the frameworks; these areas will require considerable further detailed planning to be undertaken

prior to consideration for any rezoning under the MRS. Some Planning Investigation areas have also been identified; further planning consideration would be required to determine whether any possible change to current zoning could be supported.

Central sub-region: The framework identifies where growth in the medium-to-long term should occur with the aim for these preferred locations to accommodate the majority of infill dwellings and employment development. It focuses on infill within areas with proximity to transit corridors and stations (such as around 15 stations on the Fremantle, Midland and Armadale/Thornlie lines), within activity centres (such as Cannington, Fremantle, Morley and Stirling; and specialised centres such as Curtin/Bentley and Murdoch) and urban corridors (such as Albany Highway, Canning Highway and around the Mirrabooka bus station) and areas with high quality open space and access to the broader green network.

North-West sub-region: The subregional population is relatively evenly distributed between the cities of Joondalup and Wanneroo at present, however it is anticipated that post-2021, the rate of growth will be considerably stronger in the City of Wanneroo due to its supply of undeveloped Urban zoned land



and continuing demand for coastal living. By 2050, the City of Wanneroo is projected to accommodate nearly three-quarters of the sub-region's total population.

Urban expansion and investigation areas have been identified in East Wanneroo (including South Gngangara and West Jandabup) and South Pinjar. These areas are in close proximity to existing development and infrastructure within the Wanneroo locality and form a logical consolidation of existing urban areas. Regarding the East Wanneroo urban expansion area, further detailed planning should investigate the potential for the locality of Gngangara to serve as a transition area between existing industrial development to the south and the remainder of the urban expansion area, potentially comprising lower urban densities and the retention of existing vegetation and landscape where possible.

Limited areas of land in Carabooda, Wanneroo, Jandabup and Gngangara have been identified as sites that required further Planning Investigation.

North-East sub-region: A significant amount of future development will occur on land already zoned for urban purposes. This includes continuing development within Caversham, Brabham, Bennett Springs, Dayton and Ellenbrook, Upper Swan and Bullsbrook as

well as new development at Gidgegannup, Stoneville, Parkerville and various smaller areas including at Midvale, Forrestfield, Stratton, Bellevue and Hazelmere. Any development at Parkerville (north) will need to demonstrate that the site can be adequately serviced and can mitigate bushfire risk to an acceptable level. Ensuring adequate bushfire risk mitigation will play an important role in the future development of identified land across all of the sub-regions.

The Urban Expansion areas for residential development include land at Bullsbrook, Henley Brook, Dayton/West Swan, Aveley, North Bennett Springs, Bellevue, Hazelmere, Helena Valley, Maida Vale, and Wattle Grove. These sites, with the exception of Bullsbrook which constitutes a townsite expansion, represent a consolidation and 'rounding off' of existing urban areas. The Urban Expansion area at Bellevue (north of Clayton St) may include some service industrial/ bulky goods land use as a transition between industrial and residential areas which will be confirmed by more detailed planning.

Urban Investigation areas are at West Ellenbrook, North Ellenbrook, Helena Valley, Wattle Grove, Parkerville, Mount Helena and Sawyers Valley. Planning investigation areas have been identified in Maida Vale, Pickering Brook, East Gngangara, North Ballajura and North Bennett Springs.

South Metropolitan Peel

sub-region: 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.

The framework also classifies some limited areas of land in Jandakot/ Treeby, Langford, Cardup, Mangles Bay, Pinjarra–Ravenswood sector, as well as east of Kwinana, for further planning investigation.

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.



7.6 Infrastructure

The development of communities requires a wide range of social infrastructure to enhance amenity, liveability and wellbeing through education, health and community services, and recreation services.

Community and social infrastructure required for the provision of health, education, sport and recreation services in the sub-regions will need to accommodate a growing and ageing population. The focus 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.

The provision of this infrastructure will be coordinated with the development of urban land and resultant population growth. Further identification and/or refinement of key social and community infrastructure requirements are possible as part of the review of the Planning Investigation areas.

Education

Perth and Peel residents are more skilled and have a greater level of education than 40 years ago. This reflects a response to the evolving jobs market with employment growth in skilled areas that require a post-high school qualification expected to account for 85 per cent of new jobs in the future.

Future tertiary education facilities across the sub-regions are best located close to or as part of activity centres where there is access to social, retail and cultural outlets. Good access to public transport is essential.

Future infill residential development will place further demand on existing school sites within established urban areas and continued consideration must be given to the number of high school and primary schools required to service this growing demand.

Central sub-region: The sub-region has numerous tertiary education facilities including all of Western Australia's major universities. Anticipated growth will require the development of a number of new schools including a new Inner City College in Subiaco, or the provision of additional accommodation at existing sites.



North-West sub-region: Joondalup will continue to be a major focus for tertiary education. Future high school sites have been identified for Alkimos-Eglinton, Yanchep-Two Rocks and East Wanneroo. Strategic planning for further facilities will be progressed as the population increases.

North-East sub-region: Midland will continue to be the focus for new or expanded tertiary education facilities. Future high schools have been identified for the emerging growth areas of Brabham, Ellenbrook and Stoneville with planning for further facilities required as the population increases.

South Metropolitan Peel sub-region: Murdoch University sub-campus are located at Rockingham, Whitby and Mandurah. There are numerous TAFE campuses across the sub-region including Thornlie, Armadale, Rockingham and Mandurah. Rockingham and Mandurah are identified as facilities for further growth with the potential for an additional campus in the Mundijong/Whitby area. It is anticipated that up to 32 new high schools will be required for the new greenfield urban areas.

Health

Health spending across Western Australia accounts for almost a third of State Government expenditure. The public health system responds to any change in demand by providing the most suitable health care model, which takes into consideration alternative delivery modes such as community based care and the use of Telehealth services, as well as providing care from public health facilities.

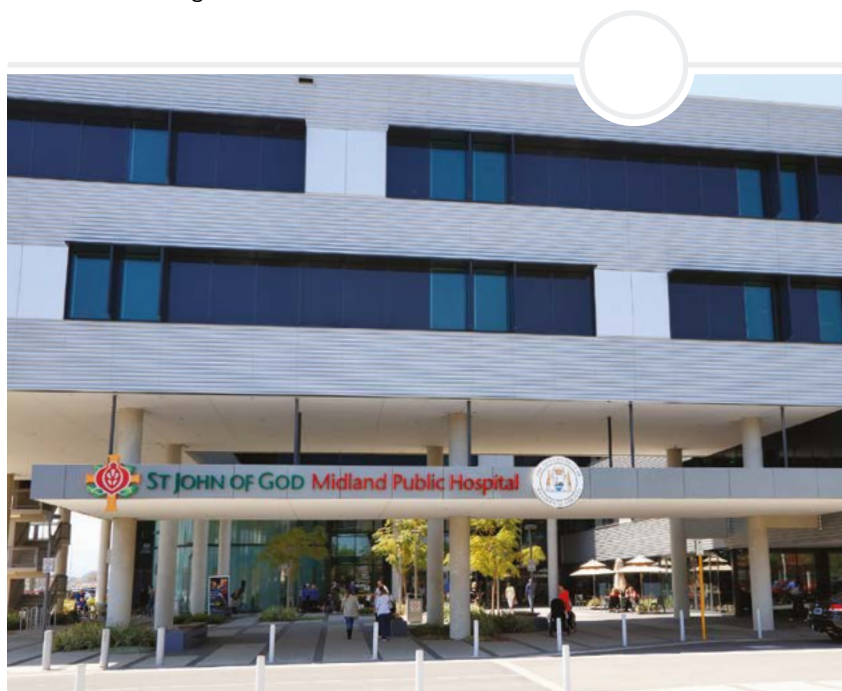
While population growth over time will result in increased demand for regional health facilities, the future focus will be to optimise the use of existing sites in preference to developing facilities on new sites.

Central sub-region: Key health facilities including Fiona Stanley Hospital and the new Perth Children's Hospital are located within the sub-region.

North-West sub-region: The Joondalup Health Campus is a key health facility within the sub-region and a main influencer in healthcare planning for both public and private healthcare needs.

North-East sub-region: The new Midland Public Hospital provides the main regional health facility for both the sub-region and the western Wheatbelt into the future.

South Metropolitan Peel sub-region: Existing regional health facilities are located at Armadale, Rockingham, Mandurah and Pinjarra; 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

With more than 5,000 grassroots sporting clubs across Western Australia, the Perth and Peel regions support a wide range of highly-utilised sporting and recreational facilities. Planning for adequate water for efficient irrigation is critical to deliver functional parkland and sporting and recreational facilities for new and existing communities, particularly in outer growth areas.

Future population growth will inevitably require additional sporting and recreational facilities across the sub-regions. Ideally, these should be co-located with other uses including libraries, education facilities and activity centres, requiring an integrated and collaborative across-Government approach to planning.

Public open space is crucial to Perth and Peel's liveability and its green network is among the largest in Australia with some 112,000 hectares of public and private land reserved for Parks and Recreation reserved in the Metropolitan Region Scheme. As a minimum, and based on principles established under the Stephenson-Hepburn Plan, 10 per cent of developed land is reserved for local public open space, in addition to regional reserves.

Central sub-region: The quality of open space will be increasingly important as the population grows and density increases. Public open space should be designed as an integral part of the urban structure and offer a variety of safe and attractive spaces that are multi-functional and easily accessible via public transport, walking and cycling.

North-West sub-region: Population growth will create a demand for additional regional and district-level sporting facilities with preliminary sites identified at Wilbinga, Two Rocks, Yanchep, and Alkimos and with the need to identify further land at East Wanneroo.

North-East sub-region: The sub-region has several State-level sporting facilities and numerous other complexes across Midvale, Caversham, Beechboro, Maida Vale and Mundaring. Recognising that sites are already well-utilised, the provision of new sites will be a priority. A new district open space facility is being developed in Ellenbrook and a potential site for regional sporting activities has been identified at North Bennett Springs.

South Metropolitan Peel sub-region: Use of existing sites will be maximised to cater for some of the additional demand but new sites will be required to meet the needs of greenfield developments at Haynes, Cardup, within the City of Cockburn, Lark Hill, Karnup East and Ravenswood.



Cemeteries

The **South Metropolitan Peel sub-region** has two cemeteries at Rockingham and Whitby. Enlargement of the existing Whitby cemetery is proposed, as well as an additional site at Keralup.

In the **North-West sub-region**, with cemeteries at Pinnaroo and Gngara, a new cemetery will be required in the long term and a site identified in Yanchep will be subject to further investigation.

The two main cemeteries in the **North-East sub-region**, at Midland and Guildford, have limited capacity. Further planning is required to identify a suitable location for a future cemetery to service the sub-region.

Transport

The integration of key centres with high quality public transport networks is a fundamental principle of the frameworks. Public transport infrastructure has been prioritised through METRONET to support the vision to deliver sensitive, sustainable and vibrant communities. This strategic infrastructure investment will provide an opportunity for the optimising of improved infill opportunities.

Ready movement of people and freight across the subregions and beyond is key to economic development and regional liveability so it is critical to integrate urban and employment centres with efficient transport infrastructure and services.

However, a significant population increase will inevitably place additional pressure of all levels of existing road and rail networks across Perth and Peel. Achieving the most efficient use of current and proposed transport networks and service and social infrastructure is a critical element of planning for this future population growth within a consolidated urban form.

To accommodate future population growth and ensure efficiency of the movement system is not compromised, the frameworks recognise the need to integrate urban and employment nodes with transport infrastructure and services, including upgrading and adding new transport infrastructure to the network.

The Western Australian Planning Commission, through the Department of Planning, Lands and Heritage, has worked extensively with the Transport portfolio towards an integrate approach of land use planning and infrastructure provision. Previous detailed planning has established Perth and Peel's extensive movement network with key elements including:

- an extensive regional road network including primary distributors, such as the Mitchell and Kwinana Freeway
- the passenger railway network
- the freight network with a range of transport assets including the Fremantle Port
- the intermodal terminal at Kewdale and national highways.

Perth is a car-centric city. Over the past 40 years, the number of cars in Perth has grown faster than the population and it now has more cars per capita than any other Australian capital city with some 83 vehicles per 100 people.

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 other transport functions reliant on the regional road system, especially freight movement.

The public transport network for the region includes an integrated network of passenger rail lines and transit corridors. Passenger rail infrastructure proposals under Stage 1 of the METRONET initiative will have a significant positive impact across sub-regional communities.

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.



Provision of a network of paths for cyclists and pedestrians offers commuters an alternative to private car trips, as well as providing recreation opportunities and associated health benefits. At a regional level, shared paths are provided along major transportation routes including railway lines and freeways. A comprehensive pedestrian and cycling network is provided at a local level through district and local structure plans.

The freight network is important to the Western Australian economy. Where practicable, these transport corridors should be protected from the encroachment of sensitive and incompatible land uses, an important consideration when identifying locations for infill housing development. Similarly, the design, construction and operation of this infrastructure within these corridors should seek to minimise impacts on surrounding land uses.

Existing general and civil aviation facilities may not be adequate to meet the needs of a population of 3.5 million people. Studies to

identify suitable locations for future airports are ongoing. Planning for the development of additional container port facilities to service future needs of a growing population is ongoing by the Westport Taskforce.

With anticipated population and job growth within Perth and Peel, additional pressure will be placed on the movement network. A range of strategies is required to alleviate road congestion through appropriate management and upgrading and offering feasible public transport options to:

- encourage people to work near where they live
- promote and encourage employment opportunities which meet the skill base of the local commuting population
- improve integration of transport within activity centres
- investigate transport options, including new routes and technology

- provide movement network improvements including upgrades and extensions of road, rail and transit priority routes
- identify new regional road networks in new urban and industrial development areas and connections to existing and proposed freight infrastructure
- address additional movement network needs and associate staging.

Each strategy is reliant on a collaborative approach across government to identify preferred locations across Perth and Peel for new infrastructure, which is anticipated to include a new airport and a port.

Central sub-region: The development of the METRONET public transport system will define the future of the movement network in the sub-region. Key transport corridors will be required to transition into multi-functional corridors to achieve a more compact and diverse urban form. Areas around train stations and other



major public transport infrastructure have been identified as having the potential to accommodate increased development. A balanced transport/land use approach will be required to accommodate all transport modes, parking and utilities as well as a people-friendly urban environment.

The future provision of transport and other service infrastructure across Perth and Peel has, where possible, been planned within shared corridors, contributing to the efficient use of land. These shared corridors have sought to avoid and minimise the impact on environmental assets, landscapes and conflicting land uses.

METRONET Stage 1 includes:

1. The Forrestfield-Airport Link from Forrestfield to the Perth CBD with three new stations: Redcliffe, Airport Central and Forrestfield.
2. Extension of the Thornlie passenger railway to Cockburn Central with two new stations proposed at Nicholson Road and Ranford Road.
3. A new rail line extending from the Midland rail line to the Ellenbrook town centre with additional stations including at Morley, Malaga and Ellenbrook.
4. Extending the Midland rail line to a new station at Bellevue and relocating the Midland rail and bus integrated station closer to the Midland Public Hospital and main retail precinct.

In addition, the Jandakot Airport Eastern Link Road, between Ranford Road and Jandakot Airport, is proposed to create a new road reservation in Canning Vale.

North-West sub-region: A significant challenge for the sub-region is to change the population's travel patterns, which will require a focus on improvements to regional roads, public transport, active transport routes and increased employment self-sufficiency. The region will need to focus on promoting strategic employment opportunities to encourage people to work where they live through:

- upgrading of the existing network, particularly the Mitchell Freeway, Marmion Avenue and Wanneroo Road
- upgrades strengthening east-west connections to the North-East sub-region
- the need for new integrator arterial roads to support development in East Wanneroo
- investigating linkages between the cities of Joondalup and Wanneroo.

Passenger rail infrastructure for the sub-region includes the following Stage 1 METRONET proposal to extend the Joondalup rail line to Yanchep with stations at Alkimos, Eglinton and Yanchep. Further investigation is required for the potential East Wanneroo Rail Link (or East-West Rail Link), to connect the Joondalup and Ellenbrook Rail Lines

in the long term. A final alignment for this rail line will be determined following further assessment of alignment options.

North-East sub-region: The movement network provides a valuable link to the greater Perth and Peel regions and nationally. It needs to build on this advantage as a gateway to national markets by upgrading the existing road network, through the proposed Perth-Darwin National Highway and the Perth-Adelaide National Highway, with a potential intermodal terminal at Bullsbrook.

Passenger rail infrastructure proposed for the sub-region includes the following Stage 1 METRONET proposals:

- a new rail line connecting the Midland rail line to the Airport and Forrestfield – with stations at Redcliffe, Airport Central and Forrestfield (also forms part of a proposed future Circle Line)
- a new rail line extending from the Midland rail line to the Ellenbrook town centre with additional stations in Morley, Malaga and Ellenbrook
- extending the Midland rail line to a new station at Bellevue
- relocating the Midland rail and bus integrated station eastwards (Cale Street) to be in proximity to the Midland Public Hospital and main retail precinct.



Further investigation is required for the proposed East Wanneroo Rail Link and the Circle Line that connects the Joondalup, East Wanneroo (potential), Ellenbrook, Midland, Armadale, Mandurah and Fremantle rail lines.

South Metropolitan Peel

sub-region: 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.

Sections of the Roe Highway (east of the Kwinana Freeway) 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.

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.

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
- an additional station on the Mandurah rail line at Karnup.

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

- investigating 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
- a long-term contingency station on the Mandurah rail line at Gordon Road.

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.

Proposed future regional roads include:

- extending Tonkin Highway to connect with the Forrest Highway south-west of Pinjarra
- upgrading of Rowley, Anketell, Thomas, Mortimer, Mundijong, Henderson, Lakes, Old Mandurah and Pinjarra Roads
- extending Mandjoogoordap Drive further eastwards across the Serpentine River.

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.

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.



Service infrastructure

Development of new urban and industrial sites across Perth and Peel, as well as the increased residential density of existing urban areas, will require significant upgrades and additions to the network of existing essential services. The sub-regional planning and infrastructure frameworks provide a substantial degree of certainty to State Government agencies on future development locations to ensure the timely and efficient delivery of electricity, water, wastewater, drainage and other service infrastructure.

Increased alignment between the development industry and servicing authorities is crucial to ensure that the release of housing and employment land is commensurate with anticipated population growth. In the case of employment land, the availability of power and gas is critical. In this regard, servicing of growth areas should occur through the progressive extension of development fronts.

To improve coordinated service delivery, the future provision of infrastructure within the sub-regions, including the road network, should be planned within shared service corridors. These are currently being investigated to provide the most direct route from supply to end-user to reduce infrastructure costs and to improve efficiency of service, while also avoiding and, where necessary, minimising the impact upon environmental attributes and conflicting land uses. The use of

shared service corridors will also contribute to a more efficient use of land within the sub-regions. 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 future service infrastructure provision.

Electricity: Western Australia's energy use has more than doubled over the past 20 years. The State's energy consumption now accounts for more than 17 per cent of all consumption nationally, with residential users as the fifth largest consumers in the State.

The supply of electricity to growth areas within the sub-regions will require the development of suitable electricity infrastructure. This may be in the form of traditional network augmentations, new terminals and sub-stations, and/or more innovative electricity supply models such as microgrids, embedded renewable energy generation and energy storage systems.

Water: Perth's groundwater resources are under increasing pressure from a drying climate, demand for public and private water supplies and changing water uses. The Department of Water and Environmental Regulation is developing (2016) a water supply strategy for Perth and Peel to identify demand gaps, viable alternative supply options and provide strategic direction of subsequent sub-regional plans.

Public scheme water supply:

Scheme water currently services more than two million people in the regions and demand is expected to double in the next 40 years. In combination with demand management, climate-resilient sources such as desalination and recycled groundwater have been developed in response to the drying climate.

Almost all of Perth and Peel's potable water supply in 2016-17 was sourced from desalination and groundwater, with roughly equal proportions of each. The Southern Seawater Desalination Plant can produce up to 100 billion litres of water every year. Combined with the Perth plant, desalination now provides about half of the city's potable water supply and is a climate independent source. A 14-billion litre per year Groundwater Replenishment Scheme, which turns highly-treated wastewater into drinking water, began recharging water to aquifers in 2017. Work is underway on the second stage of this scheme, which will increase its capacity to be able to recharge 28 billion litres of water each year. Groundwater replenishment may provide up to 20 per cent of Perth's water supply by 2060.

North-West sub-region: Future water infrastructure in the sub-region includes the need for a groundwater treatment plant in Alkimos, water storage for gravity supply in Nowergup and two sites for water treatment and storage to the east of Two Rocks. Yanchep and Two Rocks are currently served by small, closed water supply systems



that source and treat groundwater from local aquifers which the Water Corporation plans to consolidate and upgrade in the long term.

North-East sub-region: Planned water infrastructure improvements in the sub-region include new water tanks west of Ellenbrook, with the Ellenbrook reservoir as the primary storage facility to support future urban and industrial development in the northern parts of the sub-region. Bullsbrook will also require several new water tank sites in elevated areas and staged over time to serve the proposed expansion of the townsite.

South Metropolitan Peel sub-region: Existing water supply infrastructure that serves the sub-region includes several key water sources including surface water, groundwater and desalinated seawater. Water supply planning for the western sector of the sub-region indicates the likely need for additional storage facilities in Munster, Orelia and Baldivis. The eastern sector will require additional storage around Byford Tank, Mundijong Reservoir and Canns Road Tank. In the Peel sector, addition storage will be required at Bouvard, Nambeelup, Murray and Parkland to serve new development areas.

Private self-supply: Water use for private, non-potable purposes such as public open space, industry and agriculture has historically relied on cheap, readily-available local groundwater.

With groundwater availability limited to the north and south of Perth, improved water efficiency, water-sensitive urban design and alternative water supplies will be required to support the development of new urban, industrial and fresh food production areas. Recycled wastewater, particularly for irrigation of public open space and for use in the industrial sector will increasingly provide alternative supplies.

Stormwater harvesting and storage via managed aquifer recharge (MAR) has great potential in the Peel region to satisfy non-potable water use needs. As a result of the Department of Water's Murray Drainage and Water Management Plan, a MAR feasibility study was developed for the area to assist proponents to develop proposals for MAR of harvested stormwater within the plan area. A MAR system provides a safe, reliable and energy-efficient alternative water supply option for high development pressured areas.

Wastewater: Over the past decade, the volume of wastewater recycled throughout Western Australia increased by 70 per cent. In 2013, 10 billion litres was recycled in Perth; by 2030, it is estimated that 30 per cent of all wastewater collected in Perth will be recycled.

The Water Corporation has planned water and wastewater options for all land currently zoned urban and urban deferred across the sub-regions. Urban expansion and investigation areas, such as East Wanneroo, Bullsbrook and

Nambeelup will require further detailed planning to ensure appropriate services are provided.

Drainage: Management of existing and future drainage systems will need to be considered for areas identified for urban and industrial development in the draft sub-regional frameworks. Future urban development needs to increasingly incorporate water-sensitive urban design techniques to manage drainage in constrained environments to avoid flooding problems, increase amenity and liveability and reduce adverse impacts on receiving waters such as rivers and estuaries. As the responsibility for urban drain management lies with a number of organisations, a coordinated approach will be required to facilitate flood and nutrient management to avoid impacts to life and property and to improve water quality across the Perth and Peel regions.

Nutrient run-off has already impacted adversely on the sensitive Swan-Canning and Peel-Harvey catchment areas.

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 necessary – and critical – to assist in reducing nutrient and sediment export within the Peel-Harvey catchment area.

7.7 Other services

Services such as gas, waste management sites and telecommunications infrastructure will be provided progressively as development proceeds in growth areas across the Perth and Peel regions.

Planning decisions relating to telecommunications infrastructure will be guided the *State Planning Policy 5.2 Telecommunications Infrastructure*. This policy provides a framework for the preparation, assessment and determination of applications for planning approval of telecommunications facilities within the State's planning context.

7.8 Agricultural land

The Perth and Peel regions are a mosaic of rural uses, including agricultural pursuits, rural living areas and areas with a tourism function, such as the Swan Valley. With the anticipated population growth, agricultural land is likely to be placed under considerable pressure for urban purposes, environmental attributes, infrastructure corridors and basic raw material extraction.

A significant amount of suitable agricultural land has been already lost. Over time, Perth's inevitable urban growth has displaced traditional market gardens in North Perth, Bayswater, Victoria Park and

Bibra Lake, and more recently in Spearwood and Osborne Park. Land for other agricultural uses – agistment, cattle, poultry – within ready access of the metropolitan area is also coming under pressure.

A considerable amount of fresh food, including fruit, vegetables, eggs and poultry is produced in the Perth and Peel regions. Retaining food production areas close to population centres is essential and helps to reduce the costs of transport and labour and ensure a continuous fresh supply to the community.

The increasing importance of agricultural land within the Perth and Peel regions is recognised and it is acknowledged that this land should not be regarded as urban or industrial land 'in waiting'. With increased pressure to identify urban land to accommodate a growing population, there is an urgent need to secure areas for food production close to urban areas. To achieve this, the priority agricultural land must be identified and protected, taking into account the unique combination of soils, water for irrigation and access to services that occur across the sub-regions. Where supported by industry trends or needs, priority agricultural land may be investigated as primary production precincts. In the interim there is a presumption against the development and/or subdivision of rural land in the Perth and Peel regions which is inconsistent with *State Planning Policy 2.5 Rural Planning*. This policy aims to protect and preserve the State's rural land assets and limit rural residential development. It



was reviewed in 2016. Today the main production areas are based in Wanneroo, Kwinana, Swan, Armadale, Kalamunda and within the Peel region and are under increasing threat of urbanisation.

The pattern of rural living areas within Perth and Peel is characterised by lots with a minimum lot size of one hectare, with significant areas located within the North-West, North-East, and South Metropolitan Peel sub-regions.

North-West sub-region: Wanneroo has traditionally been recognised as having high-quality soils and available water, favourable climatic conditions for horticultural production, close to infrastructure, markets and a workforce. The region provides labour-intensive crops such as lettuce, broccoli, tomatoes, celery, beans and strawberries. The area is characterised by a large number of small rural lots. However, a drying climate and concerns about the long-term availability for horticulture are acknowledged as challenges for future food production in this area.

North-East sub-region: High value food production is confined to about 2,800 hectares. Most productive areas are within the City of Swan, including the high productive vineyards of the Swan Valley. Fertile valleys in the Perth Hills within the City of Kalamunda and the Shire of Mundaring produce quality stone fruit, apples, citrus and avocados for local and interstate markets. The importance

of protecting agriculture and rural values is recognised in the Swan Valley planning legislation as well as in the Swan and Kalamunda local planning schemes.

South Metropolitan Peel

sub-region: Food producing areas in the sub-region, include Kwinana, Cockburn, Rockingham and Serpentine-Jarrahdale and 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. 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 as 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.

Rural living provides alternative lifestyle and housing opportunities, but can place additional demand on community and service infrastructure that is difficult to meet.

The key priority is to preserve rural land in close proximity to major population centres, with rural living proposals to be considered by exception within planning strategies/ schemes, where topography, environmental or servicing constraints do not permit full urban development, where bushfire risk is not extreme and where environmental attributes are protected.

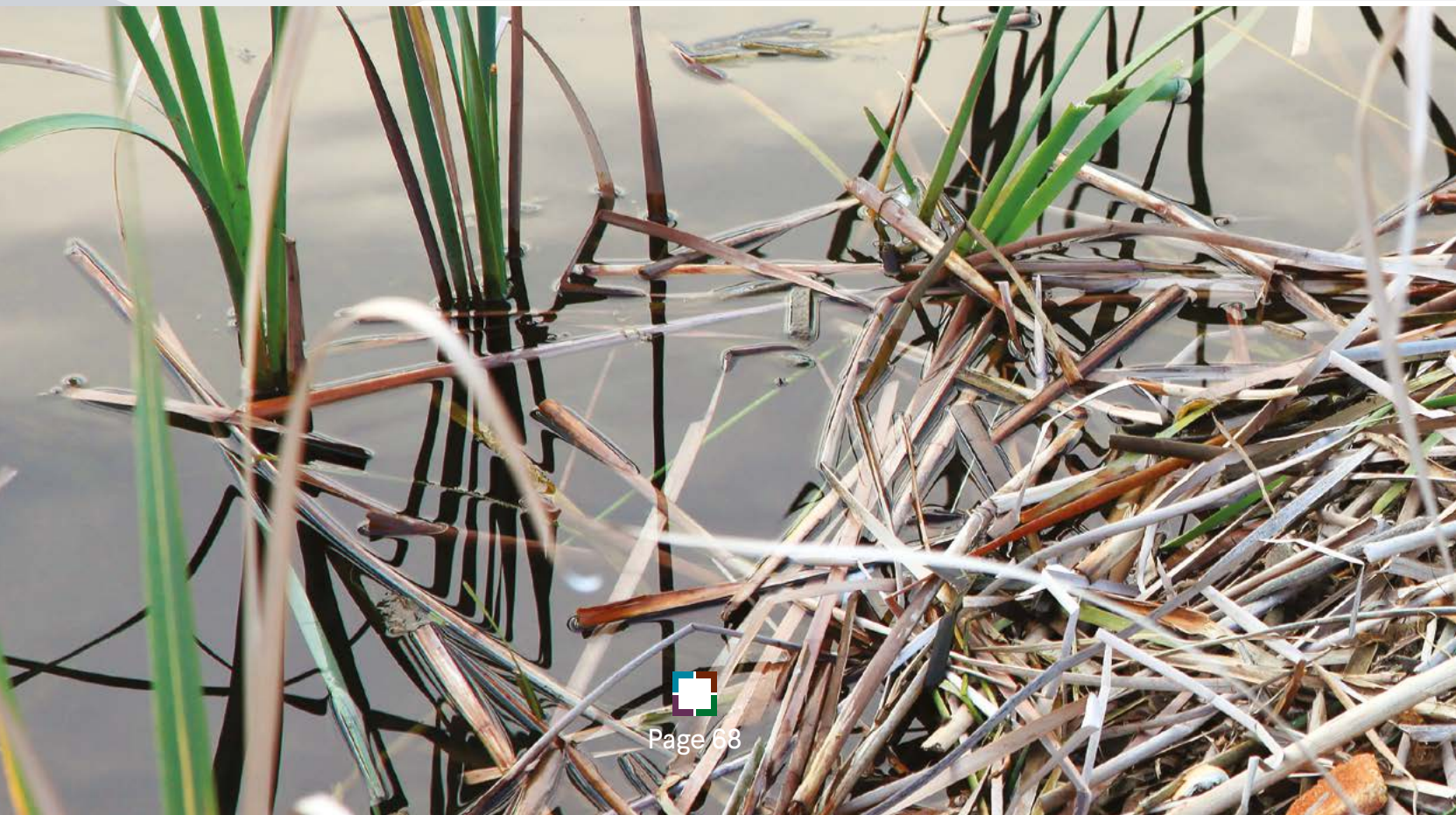
Over the years, significant areas throughout the Perth and Peel regions have been identified for rural living, within either endorsed local planning strategies and/or zoned within local planning schemes.

Each site that has been included in a Western Australian Planning Commission-endorsed planning strategy and not yet zoned has been reconsidered to address a number of factors, including avoiding environmental attributes.

In essence, there is a need to ensure that limited rural living opportunities remain, however these must be balanced against broader consolidation, environmental and servicing considerations. There does not appear to be any justification for rural living development beyond what has now been identified within the frameworks.

ENVIRONMENT AND LANDSCAPE

A key challenge in delivering a city of 3.5 million people will be to conserve the natural environment and associated biodiversity and protect it from further urban encroachment



The Perth and Peel regions are located in one of only 34 global biodiversity hotspots and the only one in Australia. Open landscapes and unique, diverse native flora and fauna, together with popular waterways, beautiful coastline and highly-utilised public open spaces give the regions a distinctive sense of place.

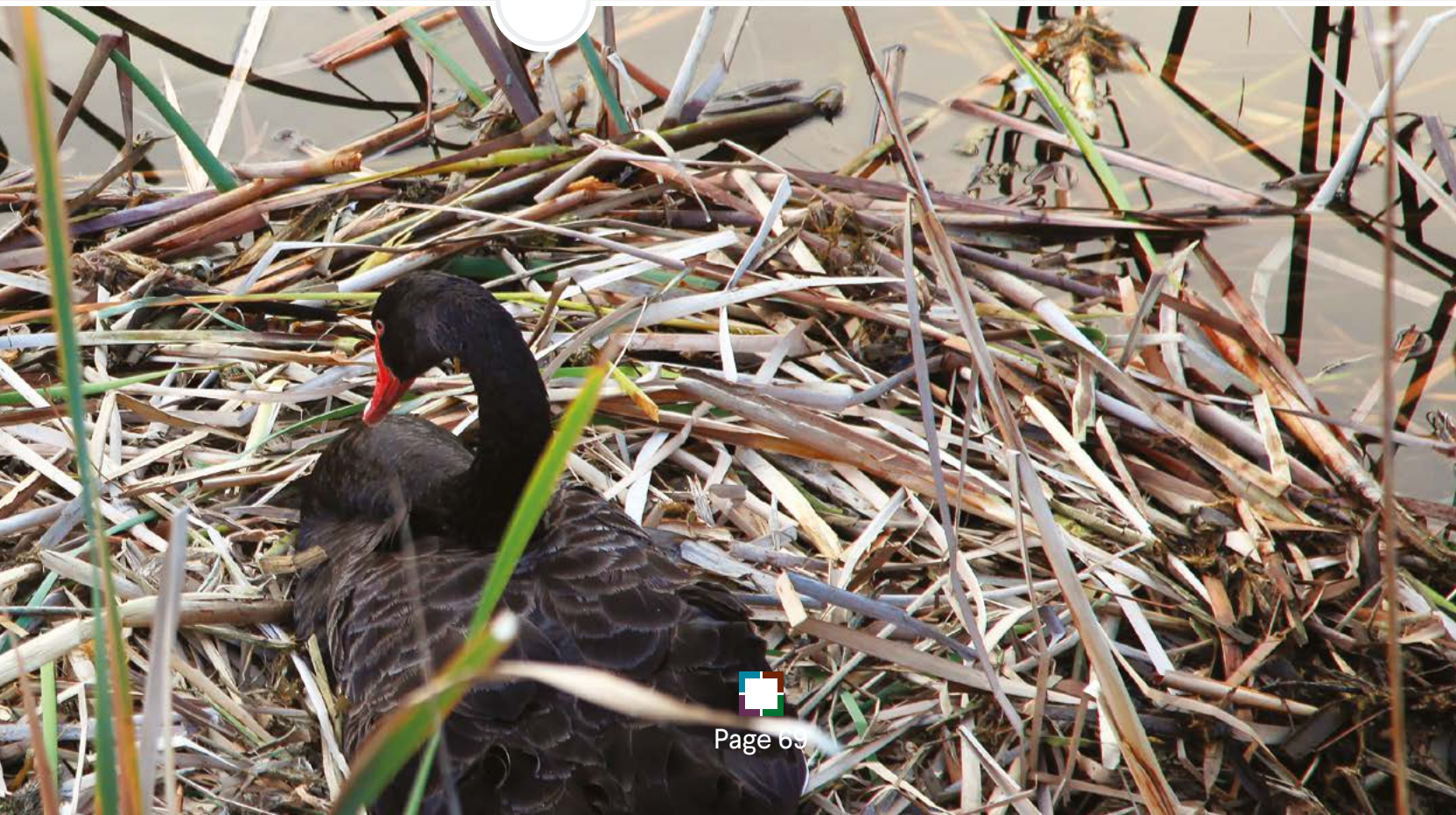
But the remaining natural environments are extremely fragile and already under stress from long and sustained urban growth and changing climatic conditions.

Achieving a positive future for Perth and Peel will depend on our ability to conserve, enhance and capitalise on high-quality environmental areas. Protected areas include:

- the coastline
- reserved areas along the Swan, Canning, Serpentine and Murray rivers
- lakes and wetland chains
- the Darling Scarp
- areas along the Darling Range and Plateau
- national and regional parks, Bush Forever sites and State forests
- areas around the Peel-Harvey estuary.

A key challenge in delivering a city of 3.5 million people will be to conserve the natural environment and associated biodiversity (Western Australia has eight of the 15 national biodiversity hotspots) and protect it from further urban encroachment.

Economic and population growth can lead inevitably to excessive pressure on environmental and natural resources if not properly managed. Already, there have been significant adverse legacies from extensive clearing of native vegetation, the introduction of invasive species and intense development pressures. Planning and development decisions are required to account for the economic, social and environmental value of natural resources and assets in the public interest.



8.1

Regional open space

Perth and Peel have a substantial network of regional open space – the Green Network – that is among the largest in Australia, comprising State forests, regional and district parklands, Bush Forever sites and green corridors, to support biodiversity, preserve natural amenity and protect valuable resources (Figure 10).

Careful planning has protected a series of valuable natural areas across the sub-regions such as Kings Park, Bold Park, Whiteman Park, State forests and Yanchep National Park and areas of significant landscape value including the Swan Valley and the Darling Escarpment, the Swan, Canning, Murray and Serpentine rivers and foreshores and great stretches of natural coastline, lakes and wetlands.

Central sub-region: More than 11,000 hectares of land form part of the proposed and existing green network, much of it included in outstanding regionally- significant landscapes such as Kings Park, the Swan and Canning Rivers estuary and Bold Park. The remainder is distributed across Bush Forever reserves, neighbourhood and district open spaces, sports fields and foreshore beach reserves. The quality of public open spaces, including the green network will be increasingly important as the population grows and density increases to ensure amenity and liveability.

North-West sub-region: With an abundance of environmental attributes, 55 per cent of the sub-region (43,000 hectares) is reserved as parks and recreation or State forest under the Metropolitan Region Scheme. (The State forest reservation may contain a variety of active uses such as forestry, mining, recreation and heritage.) Protected features include 48 kilometres of coastline, several national and regional parks and a complex system of wetlands. Two new parks and recreation sites are proposed, one adjacent to the Yanchep National Park and another east of Alkimos.

North-East sub-region: More than 80,000 hectares or 40 per cent of the sub-region is protected either as parks and recreation or as State forest reservations under the Metropolitan Region Scheme. (The State forest reservation may contain a variety of active uses such as forestry, mining, recreation and heritage.) Significant environmental and landscape features include the Darling Escarpment, forests across the Darling Range and the Swan Valley vineyards.

The abundance of trees and associated vegetation is an important component of the lifestyle that draws people to the hills region. Careful consideration of this aspect must be given to any future development.

South Metropolitan Peel sub-region: Protected parks and recreation areas, regional open space and State forest reservations comprise 51 per cent (229,750 hectares) of the sub-region. These include areas of outstanding environmental and landscape significance including a coastline connected with the Peel-Harvey estuary, lakes and wetland chains, reserves along the Canning, Serpentine and Murray rivers and forests in the Darling Plateau.

The framework proposes concentrating new urban areas in cleared pastureland rather than in areas with regionally significant conservation values. The green network will be expanded through reservation of further land and waterways along the Serpentine River, and consolidating the Yalgorup National Park at Lake Clifton and Preston Beach.

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. These waterways also provide an economic, recreational and cultural asset that is of vital importance to local communities. In recognition of this importance, the State Government is working with State



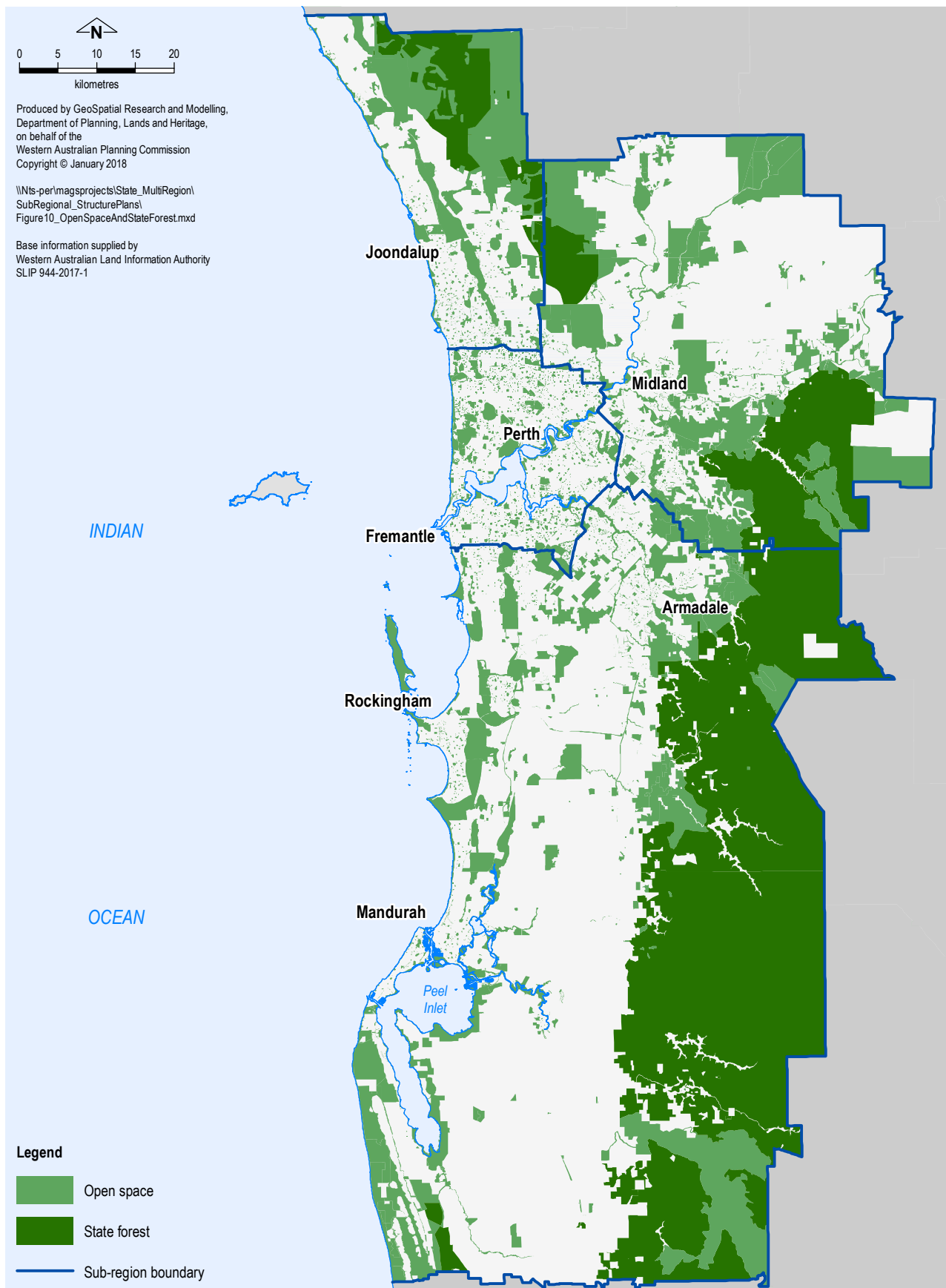


FIGURE 10: Open space and State forest

and national organisations to ensure threats to the wetlands' health are addressed.

New urban and industrial areas will, by necessity result in some changes to the existing landscape character of some localities but environmental and landscape values have been carefully considered in the identification of these areas.

Urbanisation has already led to fragmentation of some natural areas, resulting in small, patches of remnant vegetation that reduce habitat and isolate populations of native fauna. To strengthen and increase the capacity of these natural areas, the frameworks identify ecological linkages – natural areas that connect these sites to one another – to assist in fauna dispersal and migration. The challenge will be ensure ongoing protection of environmentally significant areas and to integrate inevitable changes into existing environmental and landscape features to create a sense of place.

8.2 Urban forests

The urban forests of Perth and Peel were mapped for the first time in 2014, giving a suburb-by-suburb indication of the extent of the tree canopy cover in parks and gardens, private lots, on streets and along road reserves. Trees in urban areas have social, environmental and recreation benefits, including reducing air pollution, minimising the impact of heat islands, encouraging outdoor activity, providing habitat and support to biodiversity and enhancing local amenity.

The urban forest is a valuable asset fundamental to the amenity of Perth and the wellbeing of the community. It is well established and diverse, made up of native and exotic species of varied form and maturity that provide shade, movement, colour and interest all year round.

It is facing a significant challenge due to a drying climate and the need to intensify residential densities and upgrade infrastructure in targeted areas and at the same time, improve existing vegetation coverage. Enhancing the urban forest and increasing tree canopy cover is the most efficient and economical way to reduce the effects of urban heat island in communities. Future research could consider the correlations between high levels of canopy coverage and household energy and water use, property values, health and lifestyle choices and housing types.



8.3 Adapting to climate change

Climate change is already affecting the world's climate in profound and long-term ways. Western Australia is particularly vulnerable to the impacts of climate change and these impacts are already affecting the economy, communities and environment of our State.

A hotter, drier climate will continue to increase the risk of bushfire and drought; to impact our water resources and supply; our sea levels will continue to rise, exacerbating coastal erosion and the impacts of storm surges which will affect coastal communities, infrastructure and ecosystems; it will affect the State's economy through adverse impacts on industries such as agriculture, fisheries and tourism; and climate change will continue to impact on the health and wellbeing of Western Australians with heat-related stress.

Much is already being done to adapt. Perth has an enviable system of coastal reserves which provide protection as well as biodiversity and recreation values, urban green spaces help to cool our city and improve air quality; and a strong public transit infrastructure helps to reduce reliance on fossil fuels.

But the challenges of climate change will continue and strengthen. Some future impacts are better understood than others, so ongoing research will assist, but the key is to build a city that is resilient to climate change. A resilient city will continue to thrive in spite of the impacts of climate change and adapts with measures that offer multiple benefits and create vibrant, liveable and successful communities.

In 2012 the State Government detailed its approach to climate change through its strategy *Adapting to our changing climate* which established a high-level strategic framework to support State agencies to adapt to the effects of climate change.

8.4 Bushfire management

Bushfires are now an inherent part of the Western Australian environment and the risk to lives, property and infrastructure is on the increase due to hotter, drier weather conditions; expansion of the urban/rural interface; and fuel loads increasing at a greater rate.

Many areas across Perth and Peel face a permanent risk of bushfires that cannot be underestimated. The *State Planning Policy 3.7 Planning in Bushfire Prone Areas* and associated guidelines aim to reduce the risk to people, property and infrastructure by encouraging a risk-based approach to strategic planning, subdivision, development and other planning decisions for bushfire-prone areas.

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.



8.5 Basic raw materials

The Perth and Peel regions have a limited – and rapidly diminishing – supply of basic raw materials (BRM), the sand, limestone, clay and hard rock used by the development industry in construction, for clean fill and as road base.

An estimated 90 per cent of all extracted BRM is used in commercial and residential development and demand is increasing.

At the same time, the number of economically-viable deposits is decreasing, with availability of these finite resources generally restricted by a range of environmental and land use constraints and while extraction costs are moderate, considerable transportation costs are impacting on housing affordability.

Approximately 72 per cent of the regions' remaining limestone supply is located within the **North-West sub-region**. Clay, sand and hard rock are located within the **North-East sub-region** and regionally significant deposits of limestone and sand are found the **South Metropolitan Peel sub-region**.

Sequential land use, staging of development and land use buffers will need to be considered in the future development of areas that contain BRM to avoid sterilisation of these community/economic assets.

8.6 Water resources

The management, use and availability of water to meet the regions' current and future water needs are a major challenge for Perth and Peel. A drying climate is significantly reducing groundwater and surface water availability at the same time as demand for water is increasing.

Many of Perth's natural values, such as urban wetlands and bushland are also dependent on groundwater. With groundwater availability limited to the north and south of Perth, improved water efficiency, water-sensitive urban design and alternative water supplies will be required to support the development of new urban, industrial and fresh food production areas.

The easily-developed areas to the south of Perth and in the Peel region have already been built leaving only those that have high water constraints such as flooding and inundation from high groundwater, especially in winter. These are challenges that need to be addressed and managed as development occurs. The use of innovative designs and development principles and techniques are required to achieve good water management outcomes.

The Gnangara groundwater mound located across the **North-West** and **North-East sub-regions** is the largest single source of quality fresh groundwater in the region. Nonetheless, surface water sources are still available and valuable and a significant portion of land is reserved in the Metropolitan Region Scheme to protect surface water catchments from inappropriate development. Water quality protection for both groundwater and surface water sources, used for drinking water, is achieved through an integrated land use planning and drinking water source protection program.

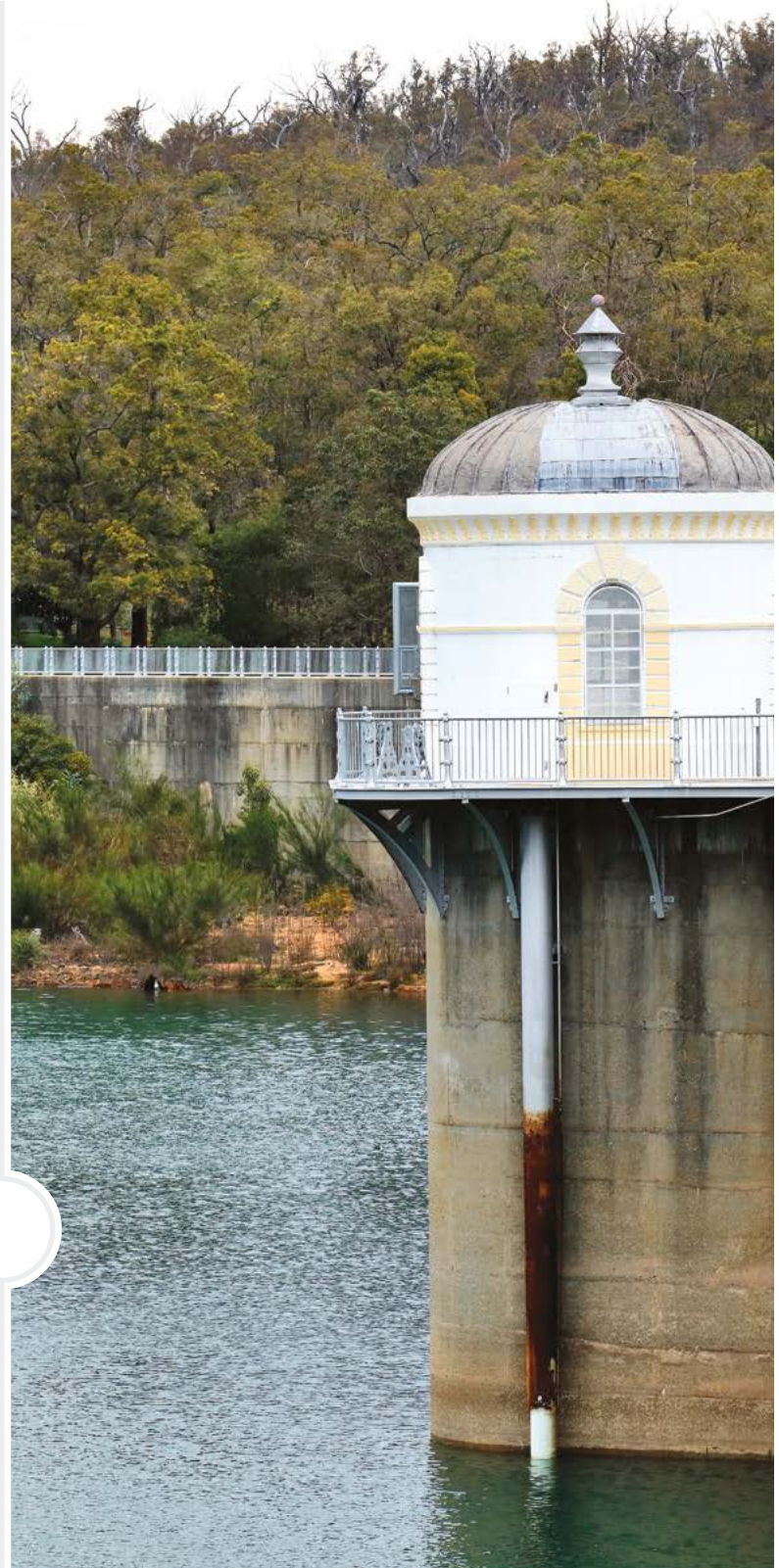
The smaller Jandakot groundwater mound, located in the **South Metropolitan Peel sub-region** is a significant source of fresh groundwater to the region. Almost the entire eastern half of the sub-region is reserved in the Metropolitan Region Scheme to protect surface water and their catchments from inappropriate development.

Effective ongoing management of these significant water sources requires careful consideration of land uses that impact on the quantity and quality of water that enters the underground aquifer. Further management is required to rationalise urban and rural uses and reduce unnecessary consumption, including greater use of alternative non-potable supplies for irrigation purposes.



State Planning Policy 2.2 Gngangara Groundwater Protection Policy guides land use change and development on the Gngangara mound to ensure it is compatible with its long- term priority use for public water supply. *State Planning Policy 2.3 Jandakot Groundwater Protection Policy* applies to the Jandakot mound with the same purpose. This policy was reviewed in 2016 to ensure on-going protection of this valuable water source from inappropriate development with only limited areas being available for land use change into the future. As a changing climate limits the sustainable supply from groundwater resources, the focus is turning to developing more effective ways of using available water. Regional water management strategies, highlighting key water considerations, have been developed for the subregions. These have identified issues including water scarcity, irrigation of public open space, protection of drinking water source areas, development adjacent to wetlands and coastal vulnerability and sea level rise.

The strategies will inform subsequent stages of water planning across the subregions at the district and local levels, to be undertaken in accordance with the WAPC's *Better Urban Water Management* document.



IMPLEMENTATION

Delivering the vision
is a shared responsibility



The sub-regional planning and infrastructure frameworks set out a long-term strategic guide for the development of Perth and Peel to accommodate a population of 3.5 million.

These are long-term plans, incorporating land use and infrastructure proposals plus an urban and employment footprint to 2050. They do not change the existing zonings and/or reservations of land, or allow for new land use. They are the next step in the ongoing process of refining and detailing planning proposals for the Perth and Peel regions.

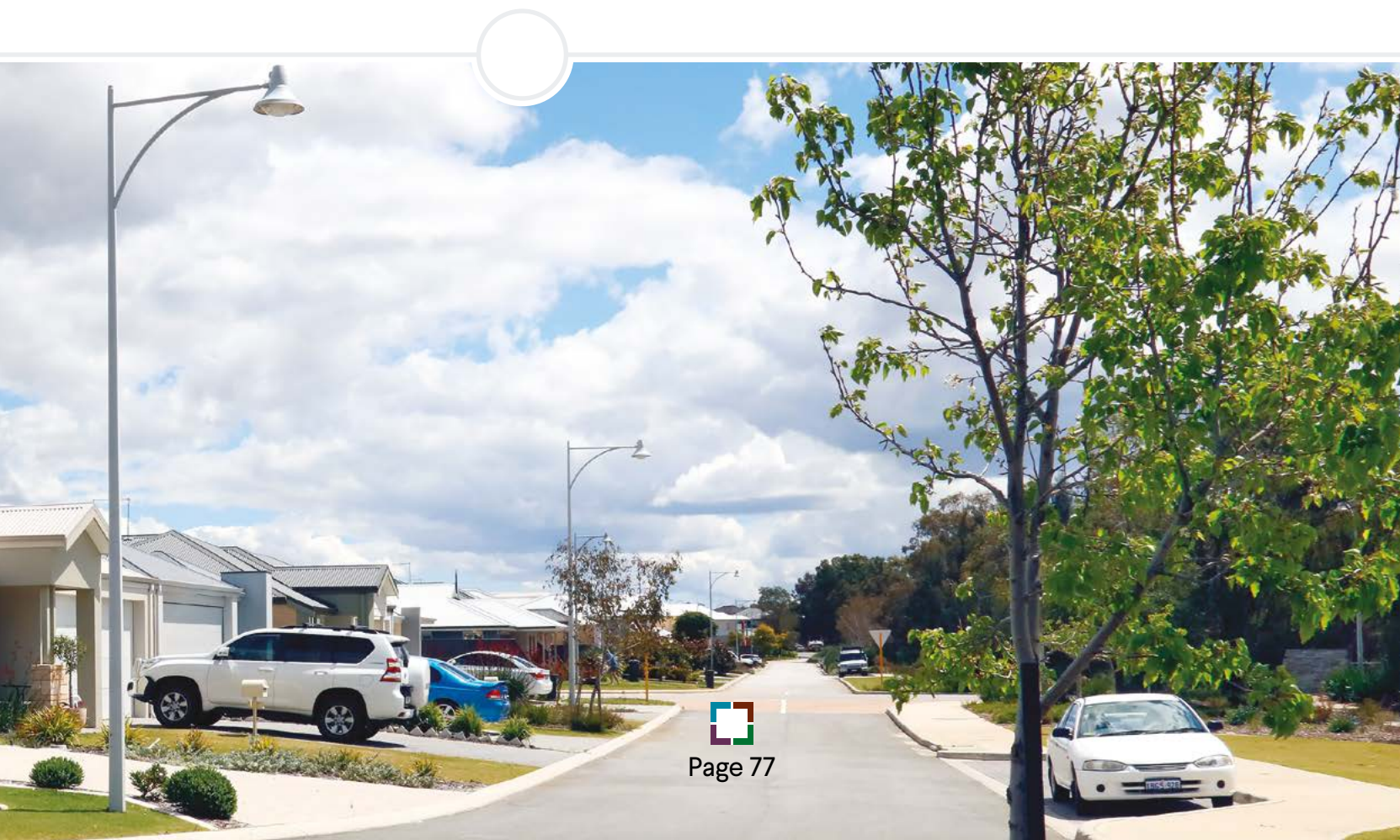
Timing for the delivery of proposals listed in the frameworks will be guided by a number of factors including development pressures and demand; landowner intentions; and the capacity of servicing agencies and local government/s within the sub-region. It is expected that all development within the sub-regions will be undertaken in a sequential manner as logical extensions to the existing development front/s and that an adequate supply of land will be continuously available.

State and local government planning bodies will need to review and refine the urban form shown in their planning schemes and strategies, and then maintain the spirit and intent of the frameworks through their planning decisions.

Both government and private infrastructure providers need to ensure their plans to build, expand and replace infrastructure take account of the expected demand for housing, employment and social infrastructure as outlined in the frameworks.

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.

The Western Australian Planning Commission will need to have an increased focus on ensuring appropriate development and refinement of strategic and associated statutory processes.



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 will ensure that land use and infrastructure data remain 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.

State and local governments must be alert to social, technological, economic and environmental trends and be proactive in predicting implications, responding to them and taking advantage of the opportunities they offer. At the same time, all governments need to eliminate unnecessary regulatory and administrative barriers to changing the way we use land and remove the financial disincentives to progress the required changes. In particular, local governments play a key role in implementing the proposals described in the frameworks. Their active support of the vision, objectives and key concepts, in collaboration with State planning and infrastructure agencies is crucial and their input through the consultation period is critical.

Most importantly, the vision articulated across the frameworks can only come about if the people and businesses of Perth and Peel recognise it, want it, and make their personal and business choices to invest and live in the urban environment the frameworks describe and promote. To assist in facilitating this, the Commission will improve its communications with key stakeholders.

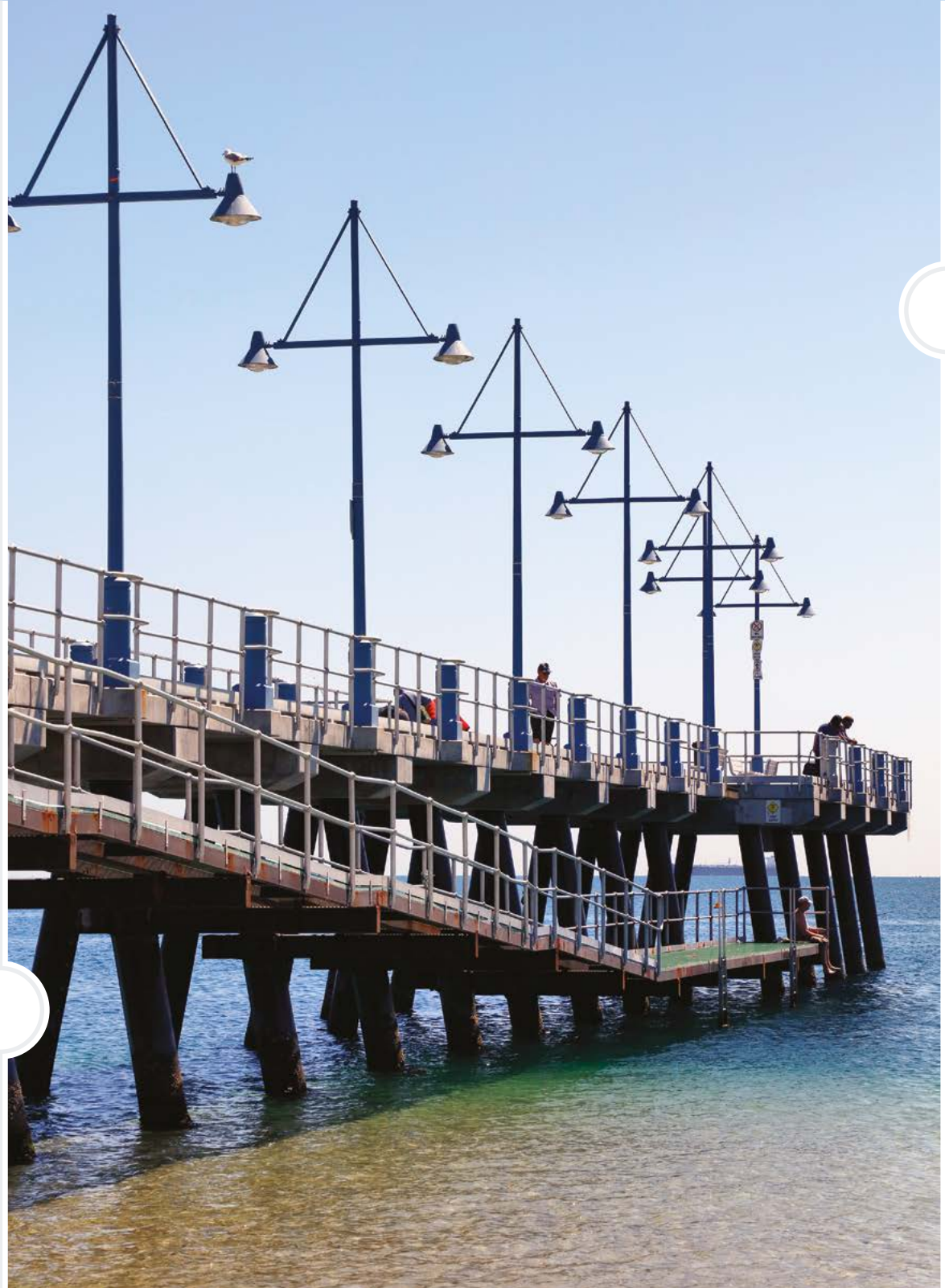
The blueprint for the future development of Perth and Peel will be implemented through the frameworks and their implementation actions. To ensure that these remain contemporary, they will be subject to ongoing monitoring and will include an initial review to be undertaken after three years. This may result in adjustment to policy settings to address barriers to the delivery of the land use and infrastructure plans.

The land use proposals and broad principles within the frameworks will be implemented by the Commission through amendments to the Region Schemes, local planning strategies and schemes, structure plans, policies and other ongoing strategic studies.

The leading strategies and actions required to achieve the vision for Perth and Peel at 3.5 million are reliant upon a shared approach across government, industry and the community.

Many items within the frameworks are yet to be subject to financial analysis and business case development as part of the annual Budget process.





Perth and
Peel@3.5million

GLOSSARY AND REFERENCES



Glossary

Activity centres: are community focal points. 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.

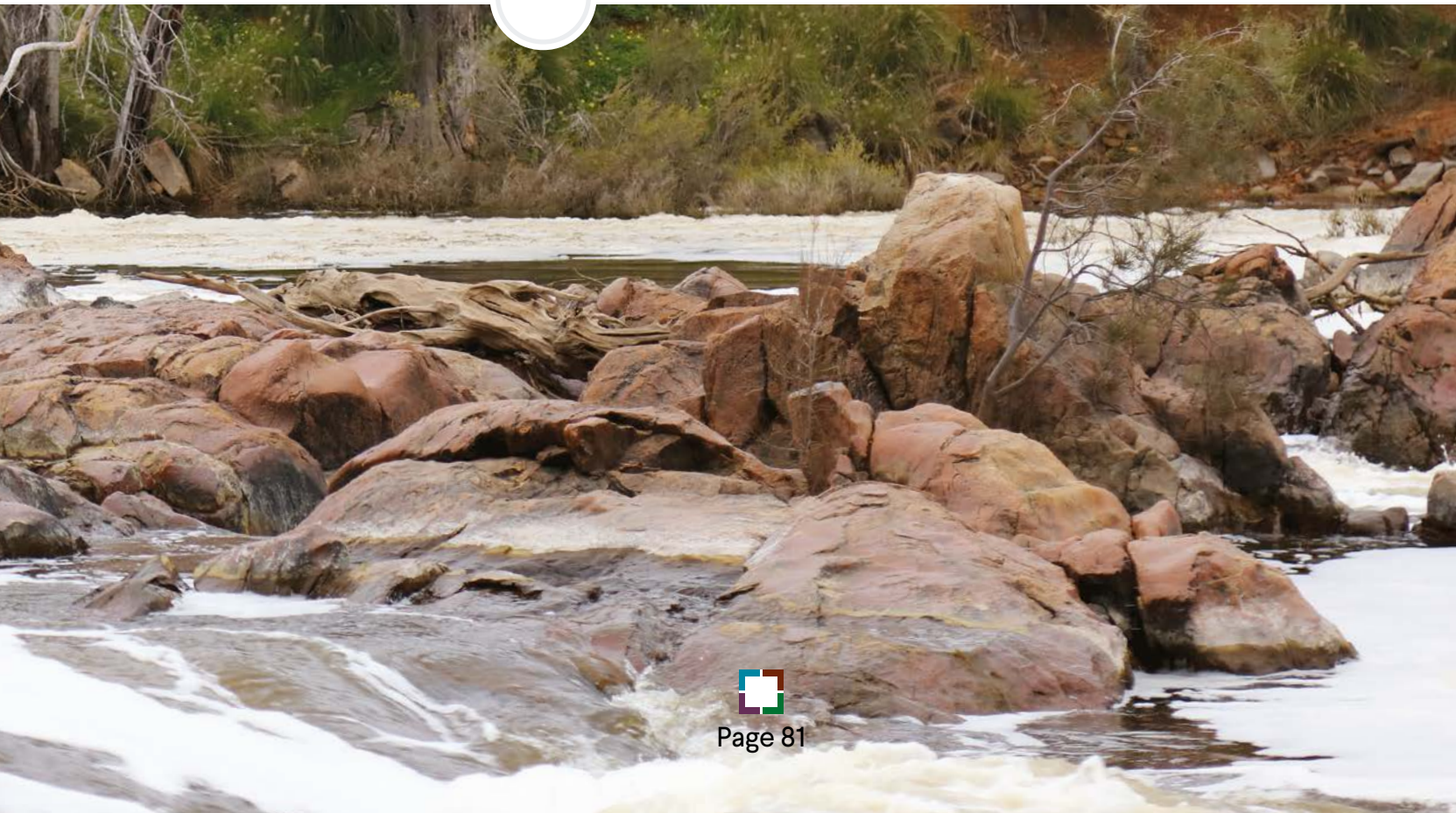
Affordable living: recognises that direct rental or mortgage payments are not the only costs that households incur. Other expenses include the consumption of water, gas and electricity, property fees and taxes, the cost of transport (to work, education and shopping) and the price of food.

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 materials that consist 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 that have been identified and/or approved, but have not yet become established.

Employment density: 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.

Employment self-containment: is the proportion of employed residents within a defined area whose jobs are located within that defined area.

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 high frequency (eg five minutes in peak time and 15 minutes out of peak time).

High priority transit corridor: where high frequency public transport services are prioritised through the use of traffic signalling priority, queue jumps at traffic lights and/or dedicated lanes.

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

Industrial expansion: is land that has been identified for potential industrial development.

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

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

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).

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 detailed planning schemes developed by local governments to manage the range of permitted land uses within specified locations. For localities covered by the Metropolitan Region Scheme, the Peel Region Scheme or the Greater Bunbury Region Scheme, local planning schemes must be consistent with the provisions identified within 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 centres not identified within *State Planning Policy 4.2 Activity Centres for Perth and Peel*, but are necessary to ensure that new urban areas have access to services in close proximity to where people live. New centres need to adhere to the activity centre hierarchy and are supported by retail needs and sustainability assessment and that there is minimum impact upon the ability for existing or emerging centres to be able to provide a range of services to the community.

New urban areas (greenfield areas): are undeveloped or minimally developed areas that have been identified for potential rezoning to allow for urban development.

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.

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

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

Priority agricultural land: is land considered to be 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.

Public drinking water source area: the area from which water is captured to supply drinking water. It includes all underground water pollution control area, 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.

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 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 recreation, primary schools, commercial/ activity centres and offices. Also refer to residential density targets.

Rural living: is 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 conservation.

Rural residential: is a sub-set of rural living and a land use zone with land parcels from one to four hectares in size and generally provided with scheme water and power supply.

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. Refer to Figure 6 in the *Perth and Peel@3.5million* document.

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

Structure plans: are plans 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: is land identified for urban use (urban or urban deferred zones) such as residential and associated activity and light industrial employment centres, recreation and open space.

Urban consolidation: includes infill development as well as 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 in greenfield areas.

Urban expansion: is land that has been identified for potential urban development in preceding planning studies, or represents the logical expansion of an existing urban area.

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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