Southern Metropolitan and Peel Sub-Regional Structure Plan

for public comment

June 2009
# Contents

1. **Introduction** ................................................................. 1  
2. **Purpose and approach** ................................................... 2  
3. **Background** ................................................................. 3  
   3.1 Identifying the need for strategic planning ...................... 3  
   3.2 Delimitation of study area and urban growth management policy areas ........ 5  
4. **The planning context** ..................................................... 7  
   4.1 Metropolitan Region Scheme and the Peel Region Scheme ........ 7  
   4.2 Network City - a previous strategy ................................. 7  
   4.3 Liveable Neighbourhoods .............................................. 9  
   4.4 State planning policies .................................................. 9  
   4.5 Directions 2031 ............................................................ 9  
   4.6 Structure plans ............................................................ 10  
5. **The sub-regional structure plan** ....................................... 14  
   5.1 Key objectives ............................................................ 14  
6. **Population** ................................................................. 17  
   6.1 Current population and population projections .................. 17  
7. **Economy and employment** ............................................. 18  
   7.1 Understanding the economy ........................................... 18  
   7.2 Employment ............................................................... 19  
   7.3 Future economic development and employment in the sub-region ........... 22  
   7.4 Key policy principles ................................................... 23  
8. **The natural environment** ................................................ 26  
   8.1 Environmental legislation and policy context ....................... 26  
   8.2 Environmental issues and applicable policies ..................... 31  
   8.3 Regional water management strategy ................................ 42  
9. **Traffic and transport** ..................................................... 54  
   9.1 Technical investigations and staging of new transport infrastructure ........ 54  
   9.2 The movement network ................................................. 54  
   9.3 Public transport .......................................................... 55  
   9.4 Regional road network .................................................. 57  
   9.5 Regional road network assessment and staging of new transport infrastructure ........................................... 60  
10. **Activity centres and activity corridors** ............................ 62  
   10.1 Activity centres: definitions and type ............................... 62  
   10.2 Activity centres hierarchy ............................................. 63  
   10.3 Activity corridors ....................................................... 82
11 Land use and density considerations ................................................. 83
11.1 The urban form ................................................................................. 83
11.2 Housing density and diversity .............................................................. 83
12 Public utilities ...................................................................................... 85
12.1 Water supply ....................................................................................... 85
12.2 Wastewater treatment ......................................................................... 86
12.3 Energy .................................................................................................. 90
13 Social and cultural ............................................................................... 98
13.1 Educational facilities .......................................................................... 99
13.2 Sport, recreation and open space ......................................................... 99
13.3 Aboriginal and european heritage ...................................................... 101
14 Implementation .................................................................................. 102
14.1 Background ....................................................................................... 102
14.2 Implementation components ............................................................... 104
14.3 Development of additional implementation mechanisms, support
strategies and technical investigations .................................................. 106
14.4 Managing a continuous process of structure plan implementation .......... 107
Public submission form ........................................................................... 115
Appendices
Appendix A: Draft southern metropolitan and peel regions urban
growth management strategy ........................................................... 109
Appendix B: Glossary .................................................................................... 112
Appendix C: Abbreviations ........................................................................... 114
List of Figures
Figure 1: Southern metropolitan and peel regions ...................................... 4
Figure 2: Southern metropolitan and peel regions urban growth
management strategy ................................................................. 6
Figure 3: Provisions of the MRS and PRS ................................................... 8
Figure 4: Inner peel structure plan 1997 ....................................................... 11
Figure 5: South east corridor structure plan 1996 ....................................... 12
Figure 6: South west corridor structure plan 1993 ..................................... 13
Figure 7: Southern metropolitan sub-regional structure plan ....................... 15
Figure 8: Wetlands and waterways ............................................................ 32
Figure 9: Acid sulphate soils ...................................................................... 35
Figure 10: Priority local natural areas ........................................................ 38
Figure 11: Rare species and threatened ecological communities .................. 39
Figure 12: Ecological linkages ................................................................. 40
Figure 13: Planning framework: integrated drainage and water management
planning with land planning processes .............................................. 43
Figure 14: Regional road network ............................................................. 58
Figure 15: Activity centre hierarchy .......................................................... 64
Figure 16(a): Rockingham primary centre: indicative location of main
activity centre precincts .................................................................74
Figure 16(b): Mandurah strategic centre: indicative location of main
activity centre precincts .................................................................75
Figure 16(c): Kwinana regional centre: indicative location of main
activity centre precincts .................................................................76
Figure 16(d): Pinjarra regional centre: indicative location of main
activity centre precincts .................................................................77
Figure 17: Existing water infrastructure ..............................................63
Figure 18: Existing wastewater treatment infrastructure .....................95
Figure 19: Existing electricity infrastructure .........................................96
Figure 20: Existing natural gas distribution network ............................97

List of Tables
Table 1: Sub-regional population: current projections .........................17
Table 2: Projected additional dwellings required ....................................17
Table 3: Sub-regional employment characteristics (2006) ......................20
Table 4: Employment by type (2006) ................................................20
Table 5: Employment and related commuting levels by
local government (2006) .................................................................21
Table 6: Future employment scenarios (to 2031) ....................................23
Table 7: Recommended water quality best practice (EPA 2008) ...............47
Table 8: The activity centres hierarchy of the southern metropolitan
and peel regions ............................................................................63
Table 9: The ranking and description of land use activities in the activity
centres hierarchy for the southern metropolitan sub-region ..............67
Table 10: Indicative highest location of existing and proposed primary,
Secondary and local activity centres ..............................................69
Table 11: Water and wastewater projects: State infrastructure strategy ...89
Table 12: Energy (electricity and gas) projects: state infrastructure strategy .93
1. Introduction

This sub-regional structure plan for portions of the southern Perth metropolitan and Peel regions should be read in conjunction with Western Australian Planning Commission (WAPC) strategic and statutory policies, plans, strategies and schemes, and all other statutory documents and guidelines that provide for a holistic approach to the development of the area. Land development must be considered in a broader context to ensure consistency with the provision of regional infrastructure and services.

This draft plan has been prepared by the Department for Planning and Infrastructure (DPI) in close collaboration with the local governments of Kwinana, Rockingham, Mandurah, Murray and Serpentine Jarrahdale, and in consultation with key state government agencies (especially the Department of Water and Department of Environment and Conservation) and service providers (especially the Water Corporation).

The structure plan is not a statutory plan, but a strategic document that aims to guide the planning and management of growth and development via a broad set of policy principles and responsibilities. In particular, this sub-regional structure plan is consistent with the recently prepared draft regional strategy, namely: Directions 2031: Spatial Framework.

The final structure plan will be adopted by the WAPC and be noted by the Minister for Planning.
2. **Purpose and approach**

The purpose of this sub-regional structure plan is to provide a strategic planning framework that gives clear direction for the planning and management of urban growth in the corridor to 2031. This plan addresses the key elements within the southern Perth metropolitan and Peel regions to inform and guide the following:

- the preparation of strategic and statutory plans and policies, by landowners, land and infrastructure developers, and by certain state government agencies; and

- the "consideration for approval" process of district and local structure plans by the state government agencies, local governments and the WAPC.
3. Background

3.1 Identifying the need for strategic planning

The southern Perth metropolitan and Peel region, comprising the local government areas of Kwinana, Rockingham, Mandurah, Murray and Serpentine Jarrahdale (as depicted in figure 1) has experienced considerable growth in development of existing urban land and demand for new urban land and infrastructure, and this has placed significant pressure on the sub-regions land and water resources. This demand is expected to continue for some years into the future.

The high rate of urban growth experienced in the sub-region has been driven by a number of factors, including:

- The high population growth rate currently being experienced by Western Australia and the Perth metropolitan area, associated with the State’s strong resource economy and the high net overseas migration levels.
- Significant shifts in fertility rates and household formation rates.
- The continued high demand for coastal locations (the sea-change phenomenon) which has resulted in particularly strong demand in the south-west corridor of the sub-region.
- The historically strong demand for, and supply of, lower-density suburban development in the metropolitan area.
- The high level of interest in housing in the sub-region (particularly coastal location and/or associated with water) as an investment asset.

Continued high levels of urban growth in the sub-region raise a number of strategic issues and challenges. These include:

- The need to ensure higher levels of integration between urban development and the provision of utility and community services, so as to ensure efficient and effective urban growth through the timely and managed release and servicing of land.
- The need to ensure the provision of a diverse range of zoned and serviced lots for urban development, supporting urban infrastructure, community facilities and services, and mixed use development to accommodate and support the establishment of employment as a vital component of a strong productive and agile economy, within the context of activity centre and activity corridor policy.
- The need to protect valuable biodiversity and ensure sustainability of biophysical environments and eco-system processes that support important assets such as the Peel-Harvey estuarine system and the palusplain.
- The need to ensure that the sub-regional attributes and assets support the greater Perth region to maintain its position as a “global city of choice” and in responding to the key issues of globalisation and sustainability. In this regard, to ensure that planning and development are based on a sound understanding of the metropolitan and state population trends (natural growth rates and migration rates) as well as a sound understanding of the metropolitan and state economies (existing and planned).
3.2 Delimitation of the study area and urban growth management policy areas

This structure plan is the culmination of substantial work undertaken over the past three years including a land capability and suitability assessment, traffic and transport modelling, and stakeholder consultation. Associated with this process is the preparation of a policy statement that identifies specific land areas, designated as “urban growth management policy areas”, where the planning and development of land and infrastructure is either encouraged or discouraged in the Perth metropolitan and Peel regions (figure 2). The purpose of delimiting urban growth management areas in the context of a spatial policy framework is to guide decisions on the following:

- the preparation and review of structure plans;
- the amendment of region and local schemes to release land for urban development and related purposes; and
- the determination of applications for development and subdivision.

The policy statement, attached as appendix 1, identifies three distinct areas namely:

- areas under immediate detailed investigation for development and/or protection;
- areas under further investigation; and
- areas not under consideration for urban development.

The study area for the sub-regional structure plan includes all three of these policy areas, although the focus of attention is clearly on those designated areas under immediate detailed investigation for development and/or protection.
FIGURE 2: SOUTHERN METROPOLITAN AND PEEL REGIONS URBAN GROWTH MANAGEMENT STRATEGY

1. Areas Under Immediate Detailed Investigation for Development and/or Protection

The focus in this area will be on managing integrated land-use and infrastructure development that meets the core objectives of Network City. Including:
- Intensified urban development and redevelopment
- Industrial development
- Agricultural/horticultural production
- Environmental protection
- Public utilities, infrastructure and related

(Includes the MRS zones of Urban, Urban Deferred, Central City Area, Industrial and Special Industrial and land under consideration for immediate inclusion within the MRS as either or all of the above zones or for some Reserved Land Category. Includes the PRS zones of Urban, Urban Deferred, Regional Centre and Industrial and land under consideration for immediate inclusion within the PRS as either or all of the above zones or for some Reserved Land category.)

2. Areas Under Further Investigation

The focus in this area will be on investigating the suitability and capability of the land for longer-term development, including:
- Future urban development (residential, retail, industrial, community facilities, infrastructure etc)
- Existing and future biodiversity conservation, ecosystem services, ecological restoration
- Existing and future agriculture
- Subsequent designation as 1 above or 3 below

3. Areas Not Under Consideration for Urban Development

The focus in this area will be on the development or rural and related activities, including:
- Agricultural production
- Strategic infrastructure
- Resource use
- Biodiversity conservation, ecosystem services and ecological restoration

FEATURES
- Regional Roads
- Major Railways
- Local Government Boundaries
- Reserves, Open Space and Regional Park
- Developed Areas

URBAN GROWTH MANAGEMENT POLICY AREAS
- Areas Under Immediate Detailed Investigation for Development and/or Protection
- Areas Under Further Investigation
- Areas Not Under Consideration for Urban Development

SUB-REGIONAL PLANNING AREA
- Planning Area Boundary

MODIFIED: 15/06/2009
Produced by GIS Analysis and Data Management Mapping and GeoSpatial Data
Spatial Information and Research Program
Department for Planning and Infrastructure
N:\Projects\wa_multiregion\South Metropolitan & Peel Structure Plan\mxds\ReportJUN09\Fig2_SouthernMetroPeelRegions-UrbanGrowthPolicy.mxd
Source: base data supplied by the Western Australian Land Information Authority, GL248-2007-2
4. The planning context

The Southern Metropolitan and Peel Sub-Regional Structure Plan has been prepared within the context of the following planning framework:

4.1 Metropolitan Region Scheme and Peel Region Scheme

The Metropolitan Region Scheme (MRS) and the Peel Region Scheme (PRS) are the statutory land use planning schemes for the Perth metropolitan region and the Peel region. The provisions of the MRS and PRS for the southern metropolitan sub-region are detailed in figure 3. The principal functions of the MRS and PRS are to reserve and zone land and control development on reserved and zoned land. The MRS and PRS reflect the agreed strategic direction for land within the sub-region and they are a catalyst for change to planning controls at the local level and subsequent local area planning.

Being large in size, the Southern Metropolitan and Peel Sub-Regional Structure Plan area encompasses several zones as prescribed by the MRS and PRS. The structure plan area is mainly zoned either urban or urban deferred, with land also reserved for regional open space, primary regional roads and other regional roads. Relatively large areas in Baldivis, Stakehill, Karnup and Parklands are zoned rural.

Amendments to the MRS and PRS will be required if land within the urban deferred and rural is to be rezoned to urban for the development, and any such amendments would only be initiated once the WAPC is satisfied that all constraints have been satisfactorily addressed.

4.2 Network City - a previous strategy

The Network City community planning strategy was prepared in 2004 following extensive consultation and represented a broad consensus on principles and priorities that were to form the basis for regional policies and plans as articulated by the community. Many of these principles and plans were not new and have existed for a long time, and formed the basis for important initiatives such as policies for liveable neighbourhoods, water sensitive urban design, vibrant centres, transit oriented development and better transport and major infrastructure investments.

Directions 2031 has refocused on principles and priorities supporting sustainable communities, including the structuring of growth around Perth and Peel and re-examines contemporary growth trends in the context of the future spatial structure of the city.
FIGURE 3: PROVISIONS OF THE MRS and PRS

FEATURES
- Local Government Areas
- MRS and PRS
  - central city area / regional centre
  - civic and cultural
  - industrial
- other regional roads
- parks and recreation
- parks and recreation restricted
- regional open space
- port installations
- primary regional roads
- private recreation
- public purposes
- railways
- rural - water protection
- rural
- state forests
- urban
- urban deferred
- waterways
- special industrial

MRS boundary
PRS boundary

MODIFIED: 15/06/2009
Produced by GIS Analysis and Data Management
Mapping and GeoSpatial Data
Spatial Information and Research Program
Department for Planning and Infrastructure
N:\Projects\wa_multiregion\South Metropolitan & Peel Structure Plan\mxds\ReportJUN09\Fig3_MRSandPRS.mxd
Source: base data supplied by the Western Australian Land Information Authority, GL248-2007-2
4.3 Liveable Neighbourhoods

Liveable Neighbourhoods is an operational policy of the WAPC for the design and assessment of structure plans (regional, district and local) and subdivision for new urban areas that are predominantly residential on greenfield and large urban infill areas which are addressed in 12 principal aims.

4.4 State planning policies

State planning policies are prepared and adopted by the WAPC under the provisions of the Planning and Development Act 2005. The state government agencies and local governments must have ‘due regard’ to the provisions of state planning policies when preparing and amending structure plans, the Metropolitan Region Scheme or local planning schemes or when making decisions on planning matters.

4.5 Directions 2031

Directions 2031 is a metropolitan spatial framework that has been prepared to guide future planning and growth of the Perth and Peel region over the coming decades. In the context of spatial planning and development of the city, Directions 2031 will be used by state and local governments to inform the more detailed planning and policy development that will continue to be undertaken collaboratively with local communities and stakeholders.

By 2031 it is anticipated that Perth and Peel will have grown from the current population of 1.65 million, to more than 2.2 million. In order to accommodate this level of growth it is estimated that we will need another 330,000 houses and 350,000 jobs. While this increase is significant, it is not unexpected. The Metropolitan Region Scheme and Peel Region Scheme include almost 19,000 hectares of land that is zoned either urban or urban deferred and is yet to be developed. Provided this land is planned and used effectively and efficiently, it is expected that it will be sufficient to comfortably meet growth demands to 2031.
4.6 Structure plans

The Southern Metropolitan and Peel Sub-Regional Structure Plan serves to update three existing sub-regional structure plans:

- The Inner Peel Structure Plan.
- The South East Corridor Structure Plan.
- The South West Corridor Structure Plan.

These existing structure plans are shown in figures 4, 5 and 6 respectively.
FIGURE 4: INNER PEEL STRUCTURE PLAN 1997

- FEATURES:
  - Southern Metropolitan Structure plan boundary
  - Metropolitan Region Boundary
  - Railway Line & Station Mandurah - Pinjarra Rail Link (Conceptual Only)
  - Urban - Landscape Design
  - Transmission Lines
  - Trunk Water Main - Existing
  - 330kV Transmission Line (Under Construction)
  - Gas Pipelines - Existing
  - Airpark
  - Floodway Protection Policy Area
  - Future Urban Cat A1
  - Future Urban Cat A2
  - Future Urban Cat B
  - Greenbelt Rural Living
  - Important Roads
  - Existing and Proposed
  - Industry - Conceptual Long Term
  - Industry - Existing and Proposed
  - Institutions - Social
  - Major Commercial
  - Mining Related
  - Mixed Business
  - Natural Protection Policy Area
  - Subject to Further Study
  - Open Space - Conservation
  - Open Space - Drainage - WSD
  - Open Space - Recreation
  - Public Utilities
  - Railway Reserves
  - Rural - Groundwater Protection
  - Rural Living
  - State Forest
  - State Highways & Roads
  - Existing and Proposed
  - Tourism
  - Existing and Proposed
  - Urban

- SOURCE:
  - base data supplied by the Western Australian Land Information Authority, GL248-2007-2

- MODIFIED: 16/6/2009
  - Produced by GIS Analysis and Data Management
  - Mapping and GeoSpatial Data
  - Spatial Information and Research Program
  - Department for Planning and Infrastructure
  - N:\Projects\wa_multiregion\South Metropolitan & Peel Structure Plan\mxds\ReportJUN09\Fig4_InnerPeelStructurePlan.mxd
FIGURE 5: SOUTH EAST CORRIDOR STRUCTURE PLAN 1996

FEATURES
- Southern Metropolitan Structure plan boundary
- Structure Planning
- Study Boundary
- Agriculture and Resource Protection Area
- Subject to District/Structure Plan
- District/Distributor Road
- Industry/Employment Centre
- Local Open Space
- Multiple Use Stormwater Corridor
- Primary Road
- Proposed Rapid Transport Route
- Public Purpose
- Regional Centre
- Urban
- Urban Deferred
- Urban - Category B - constrained
- Urban - Category A - unconstrained
- State Forest
- Regional Open Space
- Rural/Farmlands, Rural Ag Pro, Rural Landscape
- Buffer, Conservation Private Land
- Special Rural 4000sqm to 4ha
- Special Rural-Rural Living A & R.L.B.
- Regional Metropolitan Sub-Regional Structure Plan Boundary

Source: base data supplied by the Western Australian Land Information Authority, GL248-2007-2

Produced by GIS Analysis and Data Management
Mapping and GeoSpatial Data
Spatial Information and Research Program
Department for Planning and Infrastructure
N:\Projects\wa_multiregion\South Metropolitan & Peel Structure Plan\mxds\ReportJUN09\Fig4_InnerPeelStructurePlan.mxd

MODIFIED: 16/06/2009
FIGURE 6: SOUTH WEST CORRIDOR STRUCTURE PLAN 1993

FEATURES MODIFIED: 09/01/2009
Produced by GIS Analysis and Data Management
Mapping and GeoSpatial Data
Spatial Information and Research Program
Department for Planning and Infrastructure
N:\Projects\wa_multiregion\South Metropolitan & Peel Structure Plan\mxds\Fig4...MXD
Source: base data supplied by the Western Australian Land Information Authority, GL248-2007-2

STRUCTURE PLAN
LOCATION
DIAGRAM

South West Corridor
South
West
Corridor

Inner Peel

FEATURES
Southern Metropolitan Structure plan boundary

STRUCTURE PLAN
- Coastline Definition
- Air Pollution Shadow
- Area subject to further study
- Future Subdivision Limit
- Metropolitan Region Scheme
- Boundary

Proposed Rapid Transport Route
Wetlands
Basic Raw Materials
Category A1 Future Urban
Category A2 Future Urban
Category B Future Urban
District (Distributor) Road
Existing Railway Reserves

Industrial
Institutional
Major Commercial/Institutional
and Employment Centres
Mining Related Activities
Mixed Business Areas
Open Space
Primary Road

Public Utilities
Rural
Rural Living-Ultimate Urban
Tourist and Recreational Development

Southern Metropolitan and Peel Sub-Regional Structure Plan
13
5. The sub-regional structure plan

5.1 Key objectives

The Southern Metropolitan and Peel Sub-Regional Structure Plan is based on extensive technical investigations and consultation with stakeholders. The structure plan sets out the proposed structure and pattern of development for the sub-region to 2031. The structure plan also articulates the overall objectives for the structure plan area, and it includes specific policy statements in this regard.

The sub-regional structure plan has the following key objectives:

- To create a vibrant, attractive and sustainable environment in which the community can thrive.
- To ensure that the plan meets all the needs (including housing, infrastructure, services, employment, social and cultural) of the future population of the sub-region.
- To ensure that the sub-regions natural and cultural assets are fully protected, and that the biodiversity of the sub-region is enhanced.
- To ensure the most efficient use of land and infrastructure.
- To coordinate development through integrated land use and infrastructure planning and development, ensuring that best and maximum use is made of well located and unconstrained urban land and infrastructure.
- To ensure that growth is directed to areas where land is not constrained by environmental factors, by drainage issues or by potential for flooding as a result of weather events or due to climate change.
- To facilitate the economic wellbeing of the community through the provision of sufficient and diverse employment opportunities in planned and integrated activity centres.
- To provide for a coherent, efficient, safe and reliable transport network throughout the structure plan area, and to facilitate increased use of public transport services.
- To facilitate an increased range of housing options – types, densities and affordability.
- To provide the strategic context within which government and private enterprise can plan, assess options and make informed investment decisions.
- To provide the strategic context within which local government can prepare district and local structure plans.

The objectives are reflected in the Southern Metropolitan and Peel Sub-Regional Structure Plan, figure 7.
Possible new route and intersection
Possible future rapid transit route
Development subject to resolution of drainage, water management and environmental constraints
Proposed change in zoning from parks & recreation to urban to support Karnup precinct development

Legend
- Developed urban
- Undeveloped urban and urban deferred
- Industrial
- Industrial investigation
- Bush forever, parks, open space, recreation and reserves
- Public purposes
- Rail reserves and port facilities
- Rural
- Railways
- Non area
- Economic region
- Existing rail stations
- Proposed rail stations
- Railway line

FIGURE 7: SOUTHERN METROPOLITAN SUB REGIONAL STRUCTURE PLAN
5.1.1 Southern Metropolitan and Peel Sub-Regional Structure Plan

Figure 7 shows broad land use and the major transport network. Included in the identified existing and future land uses are the following categories of land:

- Developed urban. This refers to existing townsites or developed areas.
- Undeveloped urban and urban deferred. This describes land currently zoned urban and urban deferred but not yet developed.
- Future urban. This describes land, currently zoned rural, which is proposed in the structure plan for future urban development.
- Urban investigation. This describes land areas potentially suitable for future urban development, but with significant development constraints (drainage, water management, other environmental) that need to be assessed in order for the land to be considered for future urban development.
- Industrial. This describes existing zoned industrial land, both developed and undeveloped, and land proposed for industrial development in the structure plan. Applications for amendment of the MRS and/or PRS to rezone land for the creation of a new industrial area is to be supported by a business case that includes the future intended land use categories, the market demand and the land supply/demand situation.
- Industrial investigation. This describes land areas potentially suitable for longer term industrial development, but with significant development constraints (drainage, water management, other environmental) that need to be assessed. In addition to the need to address these constraints, applications to rezone the land to create a new industrial area are required to be supported by a business case that includes the future intended land use categories, the market demand and the land supply/demand situation.
- Primary and strategic city centre precincts. Figure 7 shows the indicative land areas in Rockingham and Mandurah to be designated as city centre precincts. The provisions of State Planning Policy 4.2 or such interim policy statement as approved by the WAPC, shall apply to these areas. The final extent of the areas, is to be approved by the WAPC on submission by the local government, of an activity centre plan as envisaged in section 10.2.3.
- Regional and district town centre precincts. Figure 7 shows the indicative land areas in the regional centres of Kwinana and Pinjarra, and the district centres of Byford, Mundijong, Baldivis, Karnup, Lakelands, Halls Head and Falcon. The provisions of State Planning Policy 4.2 or such interim policy statement as approved by the WAPC, shall apply to these areas. The final extent of the areas, is to be approved by the WAPC on submission by the local government, of an activity centre plan as envisaged in section 10.2.3.
6. Population

6.1 Current population and population projections

The population in the five local government areas making up the sub-region, has risen from approximately 148,000 in 1997 to approximately 222,600 in 2008, representing an annual average growth rate of 3.78% per annum in this period.

In terms of WA Tomorrow population estimates and Directions 2031, the population of the sub-region is projected to grow to 315,700 by 2031 as reflected in table 1.

Table 1: Sub-regional population: current projections

<table>
<thead>
<tr>
<th>Local government</th>
<th>2008</th>
<th>2031</th>
<th>Growth 2006 to 2031</th>
<th>Proportion of growth 2006 to 2031</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kwinana</td>
<td>26,900</td>
<td>37,000</td>
<td>10,100</td>
<td>10.8%</td>
</tr>
<tr>
<td>Rockingham</td>
<td>96,400</td>
<td>128,500</td>
<td>32,100</td>
<td>34.5%</td>
</tr>
<tr>
<td>Mandurah</td>
<td>71,900</td>
<td>105,700</td>
<td>33,800</td>
<td>36.3%</td>
</tr>
<tr>
<td>Murray</td>
<td>13,000</td>
<td>22,500</td>
<td>9,500</td>
<td>10.2%</td>
</tr>
<tr>
<td>Serpentine Jarrahdale</td>
<td>14,400</td>
<td>22,000</td>
<td>7,600</td>
<td>8.2%</td>
</tr>
<tr>
<td>Total</td>
<td>222,600</td>
<td>315,700</td>
<td>93,100</td>
<td>100%</td>
</tr>
</tbody>
</table>

It is projected that the additional population, will be accommodated in an additional 54,900 dwellings as summarised in table 2.

Table 2: Projected additional dwellings required

<table>
<thead>
<tr>
<th>Additional dwellings 2008 to 2031</th>
<th>Kwinana</th>
<th>Rockingham</th>
<th>Mandurah</th>
<th>Murray</th>
<th>Serpentine Jarrahdale</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>6,000</td>
<td>18,900</td>
<td>19,900</td>
<td>5,600</td>
<td>4,500</td>
<td>54,900</td>
</tr>
</tbody>
</table>
7. **Economy and employment**

The economy and issues relating to employment in the sub-region have been addressed through a sub-regional economic assessment and strategy (part 1) study which is the subject of a separate report.

7.1 **Understanding the economy**

The Southern Metropolitan Sub Region is currently characterized by an employment self-sufficiency (ESS - see over for definition) of 64%, and employment self containment (ESC - see over for definition) of 55% (ABS Census 2006). The combination of the levels of employment self sufficiency and self containment results in 9,332 workers currently commuting into the sub-region to work, and 34,725 commuting out to employment centres including Cockburn, Fremantle, Canning, the Perth CBD and to places further away such as the Pilbara.

Modeling suggests that 12% of jobs within the sub region are export oriented, 39% are characterized as consumer services, 35% as producer services, 13% as knowledge intensive consumer services, and 5% as knowledge intensive producer services. This results in 83% of jobs in the sub-region being characterised as population driven (mainly serving the regular basic needs of the population), and 17% being characterised as strategic (higher levels of skills and training and with revenue being derived outside the sub region). It is generally within the strategic economy/employment that innovation and productivity are found, with growth in these factors being key determinants of economic development and rising levels of prosperity.

The cities of Rockingham and Mandurah dominate the population driven economy and together account for approximately 70% of the population driven employment. The predominance of strategic economic activity occurs in the Kwinana and Rockingham industrial areas, and the resource rich south-eastern Murray, Boddington and Waroona local governments. Strategic industry is predominately resource related, with non-ferrous metal product manufacturing alone contributing 52% of all strategic jobs in the sub-region. Investment in new port infrastructure in the Kwinana complex, and rising levels of investment in upgrading industrial plant and introducing new technologies suggests continued strength and growth in the Kwinana/Rockingham industrial complex.

Significant population growth is projected to occur in the structure plan area to 2031 and beyond. Economic, environmental and social imperatives mean that the rate of employment growth must correspond, and should ideally exceed the population growth rate.

While population driven employment will naturally expand with population growth, the extent that this will occur is ultimately limited to the available expenditure of residents, workers and visitors. This expenditure is estimated to result in a maximum of 58% of total employment in the sub-region being population driven. Beyond this point, strategic employment needs to be generated through the development of industries.
that create goods and services of perceived value to external markets (intrastate, interstate and international). In addition, a business environment that facilitates the export of these goods and services needs to be developed.

Faced with a rapidly expanding urban area, increasing commuter distances and increasing costs of travel, the increasingly global nature of the metropolitan economy, and the recent fundamental shifts in global economic structure and systems, it is imperative to better understand the metropolitan economy, its processes and its requirements. Economic development is driven by four main inputs - land, labour, capital and enterprise, and planning has a key role in ensuring that these are adequately addressed.

**Definitions**

- **The participation rate** represents the proportion of the population either working or actively seeking work.
- **Employment self-sufficiency** describes the number of jobs available as a percentage of the working population.
- **Employment self-containment** describes the proportion of the local working population that actually work locally.
- **Population-driven employment** describes employment in businesses and services that serve the local population, and which generally include retail (shops), consumer services (business to consumer transactions), producer services (business to business transactions), and some knowledge intensive consumer services.
- **Strategic employment or knowledge-intensive and export oriented employment** describes employment in knowledge-intensive producer services (with higher levels of skills and training) and export oriented business (where revenue is generated outside the area). Innovation and productivity, as key generators in the economy, are generally associated with this form of employment.

### 7.2 Employment

In 2006, with an economic participation rate in the sub-region of 55%, 81,734 people out of a population of 188,178 were working or actively seeking work (labour force). ABS statistics for 2006 indicate that there were 52,360 jobs in the sub-region in a range of industries, indicating an employment self-sufficiency of 64%. On this basis, there was a “jobs gap” of 29,374 jobs, meaning that if all available jobs in the sub-region were filled by the resident labour force, then 29,374 residents would need to leave the region for work.

The ABS journey to work data indicates an employment self-containment rate of 55% for the sub-region, meaning that although there were enough jobs locally for 64% of the working population, only 55% of the resident working population actually occupy local jobs – or 43,028. This means in 2006 that there were actually 34,725 residents commuting out of the sub-region each day for work, and 9,332 people from outside commuting into the sub-region each day for work. This is summarised in table 3.
Table 3: Sub-regional employment characteristics (2006)

<table>
<thead>
<tr>
<th>Sub-region resident workforce</th>
<th>Working residents (a)</th>
<th>Total jobs (b)</th>
<th>Employment self-sufficiency % (c)</th>
<th>Working locally (b)</th>
<th>Employment self-containment % (c)</th>
<th>Commuting from outside sub-region (b) – (c)</th>
<th>Commuting out of sub-region (a) – (c)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>81,734</td>
<td>77,753</td>
<td>52,360</td>
<td>64%</td>
<td>55%</td>
<td>9,332</td>
<td>34,725</td>
</tr>
</tbody>
</table>

The type of employment existing in the sub-region has a significant impact on the living, working and travel decisions of local residents. Analysis of data indicates the following employment levels by type (table 4) within the sub-region in 2006:

Table 4: Employment by type (2006)

<table>
<thead>
<tr>
<th>Export</th>
<th>Consumer services</th>
<th>Producer services</th>
<th>Knowledge-intensive consumer services</th>
<th>Knowledge-intensive producer services</th>
<th>Unknown</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,182</td>
<td>19,949</td>
<td>17,429</td>
<td>6,391</td>
<td>2,722</td>
<td>687</td>
<td>52,360</td>
</tr>
</tbody>
</table>

Consumer services, producer services and knowledge intensive consumer services combine as “population-driven employment” and represent approximately 83% of all employment. Knowledge intensive producer services and export employment combine as “strategic employment” and make up the balance of 17% of employment.

List of terms for employment planning

**Retail**
Retail jobs have high transaction intensity and are driven by the needs of the local population. Retail tenancies must locate in close proximity to their consumer catchment, to facilitate the purchase of retail goods on a frequent basis.
This can be daily or weekly for convenience goods (groceries, newspapers) or less frequently for comparison goods (clothing, homeware). Retail is generally concentrated in centres with a supermarket anchor, to maximise transactions and reduce consumer trips.

**Consumer services**
Consumer services have a high transaction frequency, need to locate in close proximity to their customer base and often locate in commercial centres. These services typically include estate agents, travel agents and shoe repair.

**Producer services**
These services deal directly with other businesses rather than consumers, and need to locate close to the businesses they serve. Typically these services include distribution of goods, manufacturing and construction.

**Knowledge-intensive consumer services**
These are specialist services dealing directly with consumers, yet typically have a higher productivity and lower transaction frequency. Depending on the scale of operations the service may choose to locate in commercial centres or in town centre locations. Typically include general medical practitioners, accountants, veterinarians and legal services.
Knowledge-intensive producer services

These services involve business to business transactions, often less frequent but with a higher monetary value due to the intellectual property or knowledge involved. Generally locate near their client businesses, although they can be relatively “footloose” due to the frequency of transactions and where good communication infrastructure allows. Typically include engineers, architects, scientists, IT software developers.

Export

Export refers to business in which Perth or WA has a comparative advantage, where growth and development is through exports and revenue from outside. Export jobs are producer services occurring in strategic industries – mining, oil, gas and marine. In WA, these strategic industries tend to require significant supporting physical infrastructure.

Table 5 indicates the local government distribution of the population-driven and strategic jobs as well as the level of commuting determined by the employment self-sufficiency and employment self-containment levels:

Table 5: Employment and related commuting levels by local government (2006)

<table>
<thead>
<tr>
<th>Sub-region</th>
<th>Kwinana</th>
<th>Rockingham</th>
<th>Mandurah</th>
<th>Murray</th>
<th>Serpentine Jarrahdale</th>
<th>Employment Self-Sufficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>113%</td>
</tr>
<tr>
<td>Employment Self-Sufficiency</td>
<td>50%</td>
<td>67%</td>
<td>90%</td>
<td>40%</td>
<td>64%</td>
<td></td>
</tr>
<tr>
<td>Employment Self-Containment</td>
<td>22%</td>
<td>53%</td>
<td>39%</td>
<td>25%</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>Local workforce</td>
<td>9,828</td>
<td>38,117</td>
<td>22,311</td>
<td>4,949</td>
<td>6,529</td>
<td>81,734</td>
</tr>
<tr>
<td>Working residents</td>
<td>9,260</td>
<td>36,314</td>
<td>21,087</td>
<td>4,718</td>
<td>6,368</td>
<td>77,747</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local jobs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Occupied by locals</td>
<td>1,999</td>
<td>14,195</td>
<td>11,137</td>
<td>1,854</td>
<td>1,584</td>
<td>30,769</td>
</tr>
<tr>
<td>• Occupied by people from other parts of the sub-region</td>
<td>4,561</td>
<td>2,265</td>
<td>3,049</td>
<td>2,022</td>
<td>362</td>
<td>12,259</td>
</tr>
<tr>
<td>• Occupied by people from outside the sub-region</td>
<td>5,589</td>
<td>2,637</td>
<td>813</td>
<td>602</td>
<td>691</td>
<td>9,332</td>
</tr>
<tr>
<td>• Total</td>
<td>11,149</td>
<td>19,097</td>
<td>14,999</td>
<td>4,478</td>
<td>2,637</td>
<td>52,360</td>
</tr>
<tr>
<td>Types of local jobs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Population driven</td>
<td>8,613</td>
<td>16,618</td>
<td>13,841</td>
<td>2,456</td>
<td>2,241</td>
<td>43,769</td>
</tr>
<tr>
<td>• Strategic</td>
<td>2,309</td>
<td>2,286</td>
<td>990</td>
<td>1,963</td>
<td>357</td>
<td>7,905</td>
</tr>
</tbody>
</table>

Table 5 continued on next page
The relationship between place of work and place of residence is dynamic. The level of commuting is a combination of a variety of factors, including individual choice of location of residence relative to place of employment, level and type of skills of residents relative to employment opportunities in that area, and the level and type of employment available in different locations. It is unlikely that there will be an exact match between the local workforce and the local jobs available, but clearly it is appropriate to be planning for manageable levels of commuting relative to the cost of provision of major road and public transport infrastructure.

### 7.3 Future economic development and employment

The key economic challenge for the sub-region lies in bringing key stakeholders together under strong leadership to facilitate a vibrant and prosperous environment that supports a rising standard of living and high quality of life – through strengthening of economic productivity, innovation and competitiveness (that will enable the sub-region to thrive), while continuously ensuring social equity and inclusiveness for the sub-regions people, protection of key natural assets and sustainability in development.

Table 6 illustrates the employment requirements for the sub-region to 2031, under two different scenarios;

**Scenario A:** based on a situation in which the levels of employment self-sufficiency and the employment self-containment remain the same as they are now, at 64% and 55% respectively

**Scenario B:** based on a situation where the employment self-sufficiency increases to 75% and the employment self-containment increases to 66%.
Table 6: Future employment scenarios (to 2031)

<table>
<thead>
<tr>
<th></th>
<th>2006</th>
<th>2031: Scenario A</th>
<th>2031: Scenario B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment self-sufficiency</td>
<td>64</td>
<td>64</td>
<td>75</td>
</tr>
<tr>
<td>Employment self-containment</td>
<td>55</td>
<td>55</td>
<td>66</td>
</tr>
<tr>
<td>Local labour force</td>
<td>81,734</td>
<td>137,127</td>
<td>137,127</td>
</tr>
<tr>
<td>Local jobs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• occupied by locals</td>
<td>43,028</td>
<td>71,746</td>
<td>86,096</td>
</tr>
<tr>
<td>• occupied by people from outside</td>
<td>9,332</td>
<td>16,015</td>
<td>16,750</td>
</tr>
<tr>
<td>• total</td>
<td>52,360</td>
<td>87,761</td>
<td>102,845</td>
</tr>
<tr>
<td>Types of local jobs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• population driven</td>
<td>43,769</td>
<td>79,534</td>
<td>85,865</td>
</tr>
<tr>
<td>• strategic</td>
<td>7,905</td>
<td>8,227</td>
<td>16,980</td>
</tr>
<tr>
<td>Commuting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• commuting in</td>
<td>9,332</td>
<td>16,015</td>
<td>16,750</td>
</tr>
<tr>
<td>• commuting out</td>
<td>34,752</td>
<td>58,702</td>
<td>44,352</td>
</tr>
</tbody>
</table>

In table 6, the number of population driven jobs in 2031 (to serve a projected population of 315,700) peaks at slightly over 85,000. Strategic employment grows marginally from current levels in scenario A, but requires a quantum leap of two times the current amount of strategic jobs by 2031 under scenario B. The levels of commuting grow by 1.7 times under scenario A and at a lesser 1.4 times current commuting levels under scenario B. Levels of commuting have significant implications for future planning and provision of transport infrastructure (see section 8 for more details).

7.4 Key policy principles

In meeting the challenges for economic development and job creation, the structure plan identifies a number of key policy principles (figure 7 (b) and plan b: economy and employment)

**Policy principle 7.1: the role of the sub-region in the greater metropolitan economy**

The future economic role of the sub-region in the context of the greater Perth metropolitan economy, must be determined as a priority.

**Policy principle 7.2: the structure, processes and needs of the sub-regional economy**

Planning in the sub-region must be based on a clear understanding of the structure, workings and requirements/needs of the sub-regional economy. The main elements of economic development are land, labour, capital and enterprise. Land and land management increasingly needs to be integrated with all of these elements.
Policy principle 7.3: governance structure
The local governments in the sub-region, together with government departments and other institutions mandated to deal with and support economic development, must reach agreement on the formation of a governance structure to develop and implement economic strategy, and drive economic development and employment creation in the sub-region.

Policy principle 7.4: increasing employment self-sufficiency and employment self-containment
Economic strategy must have a key focus on increasing the levels of employment self-sufficiency by increasing the number of employment opportunities in the sub-region, and increasing the local workforce take up of local employment opportunities through training and education programs that more closely align local skills levels with employment opportunities, and through the attraction of business enterprise that is aligned with local skills levels.

Policy principle 7.5: maximise population driven employment
Population driven employment must be optimised, through the application of the activity centres policy and the application of Liveable Neighbourhoods into district and local structure plans.

Policy principle 7.6: facilitate growth in strategic employment
Strategic employment must be facilitated through: (a) enhancing and widening supply chains and competencies associated with existing strategic enterprise; (b) attracting new anchor investment projects; (c) enhancing the local ability to innovate through initiatives such as commercialised research facilities, attraction of venture capital, and establishment of business incubators; and (d) the provision of appropriate infrastructure in support of all the above.

Policy principle 7.7: district and local structure plans to set employment targets
District and local structure plans must set targets for the creation of population driven and strategic employment and demonstrate how these targets are to be achieved.

Policy principle 7.8: district and local structure plans to identify diverse range of employment areas
District and local structure plans must plan for a diverse range of business and employment generating activities (including commercial, industrial, institutional, special/mixed business and home-based). Different sites for specific uses in the broader categories of employment should be identified in accordance with the principles established in Liveable Neighbourhoods.
**Policy principle 7.9: areas of employment to be connected by public transport**

Individual areas of employment must be connected with high-frequency public transport services to one another and to major public transport facilities (train and/or bus stations).

**Policy principle 7.10: development opportunities associated with railway and bus stations**

Railway and bus stations hold strategic development opportunity and must be investigated and considered for appropriate development in the context of their proximity to, and relationship with, adjacent activity centres.
8. The natural environment

The sub-regional structure plan has been informed by an extensive assessment of the natural environment. The area contains a number of environmental assets which are statutorily protected, and it contains a number of environmental constraints to future development. The most significant environmental issues relate to the management of water and natural areas within the context of proposed future urban development. Importantly, the natural environment has strong connections to that of the wider landscape of the sub-region, predominantly characterised by the seasonally inundated palusplain which is a critical flood plain area for the Peel-Yalgogup system.

The structure plan area is immediately adjacent to the internationally recognised Peel-Yalgogup Ramsar-registered site. The Peel-Yalgogup system comprises a large number of inter-connected wetlands, rivers and other drainage features and groundwater sources that contribute to the complex hydrology of the area. The system is highly vulnerable to nutrient discharges from urban and rural land uses, and the future health of the waterways requires adequate flow regimes and hydrological connection with floodplains. State and local governments are responding to these issues through the preparation of various urban water management strategies and plans that integrate land use and water planning processes.

The structure plan area also contains regionally significant bushland, some of which is protected in Bush Forever sites, regional parks and the state conservation estate. Other areas containing regionally significant bushland are located in the structure plan area and across the sub-region, and these are referred to as ‘local natural areas’. Careful planning for the retention and protection of local natural areas is required through future structure planning processes, especially for areas containing under-represented vegetation complexes, threatened ecological communities, declared rare flora and habitat for specially protected fauna. Local governments are planning for the conservation of these areas through the preparation of local biodiversity strategies and incorporation into local planning strategies, schemes and policies. An initiative to identify regional ecological linkages across the Peel and South-West regions is also underway, which will assist future land use planning in the sub-region.

8.1 Environmental legislation and policy context

A number of acts of legislation, policies, strategies and other initiatives, at the Federal, State and local government levels, are relevant to environmental management in the sub-region. The main legislation and policies relevant to the southern metropolitan and Peel regions are outlined in the following sections.

8.1.1 Federal Government

The Environmental Protection and Biodiversity Conservation Act 1999 is the Australian Government’s central piece of environmental legislation, which is administered by the Department of Environment, Water, Heritage and the Arts. The Act provides for
the protection of ‘matters of national environmental significance’, the conservation of biodiversity, and a national environmental assessment and approvals process. The southern metropolitan and Peel regions contains species, ecological communities and wetlands listed under the Act. Any proposed action that is likely to have a significant impact on environmental matters listed is required to be referred to the Federal Minister for the Environment, Heritage and the Arts for a decision on whether an assessment is required. A major potential trigger for referral of proposals is the Peel-Yalgogorup system Ramsar site.

The National Strategy for the Conservation of Australia’s Biological Diversity is the primary policy for the conservation of Australia’s biodiversity, which has been prepared as a requirement of the international Convention on Biological Diversity. The national strategy adopts several principles as a basis for its objectives and actions, which should be taken into consideration for land use planning and biodiversity conservation.

The National Objectives and Targets for Biodiversity Conservation 2001-2005 aim to prevent clearing of ecological communities with less than 30% of the original extent remaining; recover ecological communities with less than 10% of the original extent remaining; and protect threatened species and ecological communities. Land use planning for the southern metropolitan and Peel regions should take these national objectives and targets into account.

8.1.2 State Government

The Wildlife Conservation Act 1950, administered by the Department of Environment and Conservation (DEC), provides for the protection of native flora and fauna in Western Australia. Threatened species listed under the Act, as well as a non-statutory list of threatened ecological communities being maintained by DEC, are categorised as critically endangered, endangered or vulnerable. The southern metropolitan and Peel regions contain threatened species and threatened ecological communities that should be taken into consideration in land use planning. Importantly, unknown locations of threatened species and threatened ecological communities should be carefully taken into account through adequate survey at the appropriate stage of the planning process.

The Environmental Protection Act 1986, administered by the Environmental Protection Authority (EPA) with support from DEC, is the principal piece of legislation governing environmental protection in Western Australia. The main purposes of the Act are to provide for conservation, preservation, protection, enhancement and management of the environment; and deal with prevention, control and abatement of pollution and environmental harm. The Act provides for the assessment of environmentally significant projects by the EPA, and it contains provisions that protect native vegetation while allowing for approved clearing activities. Land use planning in the southern metropolitan and Peel regions should seek to minimise environmental harm (including removal of native vegetation) so as to avoid the requirement for environmental impact assessment by the EPA.
The Planning and Development Act 2005, as the principal piece of legislation governing land use planning and development in Western Australia, is an important consideration in environmental protection and management. The Act establishes the preservation and conservation of the natural environment as “matters which may be dealt with by planning scheme”. This includes the protection of natural resources, the preservation of trees, vegetation and other flora and fauna, the maintenance of ecological processes and genetic diversity, and the conservation of water. These matters apply to region planning schemes (including the MRS and PRS), local planning schemes and conditions of subdivision.

Bush Forever is a whole-of-government initiative designed to identify, protect and manage regionally significant bushland on the Swan Coastal Plain portion of the Perth metropolitan region. Bush Forever identifies 287 sites containing 51,200 hectares of bushland for protection. Metropolitan Region Scheme Amendment 1082/33 Bush Forever and Related Lands was endorsed for public comment in 2004, supported by Planning Bulletin 69 Proposed Bush Forever Protection Areas. The amendment, scheduled for finalisation in 2009, will identify Bush Forever areas on the MRS map, including 94 sites to be designated to parks and recreation.

State Planning Policy 2.8 Draft Bushland Policy for the Metropolitan Region, released in 2004 and scheduled for finalisation in 2009, provides a statutory policy and implementation framework to address bushland protection and management issues in Perth. The policy provides policy measures for Bush Forever protection areas and local bushland (all areas of native vegetation outside Bush Forever in the Perth metropolitan region). The southern metropolitan and Peel regions contains Bush Forever sites that must be taken into consideration in future land use planning. In addition, the DEC’s Swan Bioplan identifies regionally significant natural areas that require consideration for protection.

Directions 2031 is an important consideration in managing future development and environmental protection and contains strategies and actions relating to environmental management, including biodiversity conservation, water resource protection, and reducing the ecological footprint of Perth, Mandurah and Murray.

State Planning Policy 2 Environment and Natural Resources Policy is the principal state planning policy dealing with environmental management through land use planning in Western Australia. The policy contains provisions relating to water resources, biodiversity, agricultural land, basic raw materials, landscape and energy efficiency, which should be taken into consideration in land use planning.

State Planning Policy 2.1 Peel-Harvey Coastal Plain Catchment Policy aims to ensure that land uses within the Peel-Harvey estuarine system likely to cause environmental damage to the estuary are brought under planning control and prevented. The policy contains provisions relevant to different land uses (residential, rural-residential, recreation, commercial, industrial and intensive agriculture) and provides guidance for implementation of the policy provisions through local planning schemes.
EPA Position Statement No. 2 Environment Protection of Native Vegetation in Western Australia provides an overview of the EPA position on the clearing of native vegetation in Western Australia. The EPA expects that the State Government would take account of the principles and objectives of the National Strategy for the Conservation of Australia's Biological Diversity prior to making decisions in relation to proposals. The position statement adopts the 30% and 10% thresholds contained in the National Objectives and Targets for Biodiversity Conservation 2001-2005, which should be taken into consideration for land use planning in the southern metropolitan and Peel regions.

EPA Guidance Statement No. 10 Level of Assessment for Proposals Affecting Natural Areas within the System 6 Region and Swan Coastal Plain Portion of the System 1 Region provides guidance for schemes and proposals potentially impacting on regionally significant natural areas within the System 6 Region and Swan Coastal Plain portion of the System 1 Region. The statement was developed because the Swan Coastal Plain is the focus for the largest number of development proposals brought to the EPA for assessment of environmental impacts. Much of the Swan Coastal Plain is altered to such an extent that all remnant vegetation from many of the vegetation complexes is regionally significant and in need of retention and some level of protection. However, the statement recognises the importance of land uses other than conservation within the Perth metropolitan and Greater Bunbury regions, stating that the 30% retention target may be modified for constrained areas (urban, urban deferred and industrial zoned land), and land with development approvals. The modified target for constrained areas of Perth and Bunbury is to seek to retain at least 10% of the pre-clearing extent of each ecological community.

Environmental Protection Policy (Peel Harvey Estuarine System) 1992, sets out the environmental quality objectives for the Peel Harvey estuary, which if achieved will serve to rehabilitate the estuary and protect the estuary from further degradation. The policy also sets out the means by which the environmental quality objectives are to be achieved and maintained.

State of Play: Peel-Harvey Eastern Estuary Catchment Environmental Assessment Discussion Paper was developed as a key information source for planners and landowners intending to develop land within the study area. The report provides guidance on environmental management priorities and development constraints, including wetlands and waterways, water and nutrient management, and native vegetation and fauna.

State Planning Policy 2.7 Public Drinking Water Source Policy addresses land use and development in public drinking water supply areas – and protects and manages public drinking water source areas from incompatible land uses and pollution.

State Planning Policy 2.3 Jandakot Groundwater Protection Policy ensures that development over the Jandakot groundwater mound is compatible with the long term use of the groundwater for human consumption.
State Planning Policy 2.9 Water Resource Policy provides clarification and additional guidance to planning decision-makers for consideration of water resources in land use planning.

Rights In Water and Irrigation Act 1914, under which the Department of Water (DoW) is responsible for the management and allocation of Western Australia’s terrestrial water resources – including water entitlements, permits to interfere with a water course, and licences to construct a well.

8.1.3 Local government

Perth Biodiversity Project and South West Biodiversity Project are initiatives of the Western Australian Local Government Association (WALGA) that support local governments with the identification, planning, protection and management of local natural areas. Local governments are encouraged to develop local biodiversity strategies in accordance with the Local Government Biodiversity Planning Guidelines for the Perth Metropolitan Region and the Local Government Biodiversity Planning Guidelines: Addendum to the South West Biodiversity Project Area published by WALGA. Local biodiversity strategies include targets and strategies for the retention, protection and management of local natural areas by local governments.

Four local governments are developing local biodiversity strategies:

- Town of Kwinana released its Stage One Local Biodiversity Strategy: Draft for Public Discussion in July 2007, and its Draft Local Planning Policy - Natural Areas in November 2008. The Town is also preparing a summary of its local biodiversity strategy for incorporation into the local planning strategy.

- Serpentine Jarrahdale Shire released its final Local Biodiversity Strategy in July 2008, following a period of public consultation. The Shire is also preparing a private land conservation incentives strategy and a local planning policy to guide implementation of the local biodiversity strategy.

- City of Rockingham has prepared a draft Local Biodiversity Conservation Policy Review and Identification of Issues. It is intended that the report will inform the review of the town planning scheme, preparation of the local planning strategy, and future structure planning.

- City of Mandurah released its Bushland Protection Strategy: Discussion Paper for public consultation in February 2003. The City is now preparing a local biodiversity strategy and a local planning policy to provide further direction on local biodiversity conservation.

The South West Biodiversity Project is also coordinating the South West Regional Ecological Linkages project in conjunction with DEC and other stakeholders. Ecological linkages are defined as a series of contiguous and non-contiguous patches, which by virtue of their proximity to each other, act as stepping stones to facilitate the maintenance of ecological processes and the movement of organisms within and across the landscape. The linkages project aims to identify a series of ecological linkages between Mandurah and Manjimup, in order to guide future land use and conservation planning in the South-West. Regional ecological linkages have already been mapped by Perth Biodiversity Project for the Perth metropolitan region.
8.2 Environmental issues and applicable policies

The environmental issues outlined in the following sections are critically important in determining future development within the structure plan area. It is proposed that the environmental issues be managed in accordance with the stated policy principles.

8.2.1 Wetlands and waterways

Figure 8 identifies the key wetlands and waterways in the sub-region. Key issues for development relevant to wetlands and waterways include:

(i) The Peel-Yalgorup system, which is a site registered under the 1971 International Ramsar Convention. Under the Environmental Protection and Biodiversity Act, it is an offence to undertake any activity that has or will have a significant impact on a Ramsar site.

(ii) Environmental protection policy lakes, which are protected under the Environmental Protection (Swan Coastal Plain Lakes) Policy 1992. The filling, draining, excavating, polluting and clearing of these lakes is an offence.

(iii) Conservation category wetlands, which are recognised under the Environmental Protection Act. The wetlands have a high level of ecological attributes and functions, and are the highest priority wetlands for protection.

(iv) Resource enhancement wetlands and multiple use wetlands, are recognised under the Water and Rivers Commission Position Statement on Wetlands (2001). Resource enhancement wetlands have a substantial level of ecological attributes and functions and are a priority for protection. The management of multiple use wetlands should be considered within the context of ecologically sustainable development.

(v) Floodplains which comprise both floodway and floodfringe, as mapped by the DoW. Development that is located within the floodway and is considered obstructive to major flow is not acceptable as it would increase flood levels upstream. No new dwellings are acceptable within the floodway. Development that is located within the floodfringe is considered acceptable with respect to major flooding. However, a minimum habitable floor level of 0.50m above the adjacent 1:100 annual recurrence interval flood level is recommended to ensure adequate flood protection.

Policy principle 8.1.1: Peel-Yalgorup system

All planning and development proposals for the structure plan area must clearly demonstrate that potential impact on the Peel-Yalgorup Ramsar-registered site, including its catchment, will be appropriately managed so as to avoid significant or cumulative impact on the wetlands.

Policy principle 8.1.2: wetlands

Any planning or development proposal affecting conservation category wetlands and resource enhancement wetlands within the structure plan area must demonstrate that the wetlands are to be retained with appropriate buffers from adjoining land uses, including retention and re-establishment of upland vegetation contiguous with the wetlands. Any proposals that pose unavoidable impacts should establish appropriate offsets to achieve the EPA's published objectives (EPA Position Statement No.9 – Environmental Offsets).
FIGURE 8: WETLANDS AND WATERWAYS

- Byford
- Mundijong
- Kwinana
- Rockingham
- Mandurah
- Pinjarra
- Murray
- Serpentine-Jarrahdale
- Waroona
- Mandurah
- Rockingham
- Kwinana
- Armadale
- Cockburn
- Sub-Regional Planning Area

Features:
- Structure Plan Boundary
- Local Government Boundaries
- Rivers
- Reservoir
- Lakes, Estuary

Geomorphic Wetlands:
- Conservation
- Resource Enhancement

Floodway:
- Priority 1
- Priority 2
-Priority 3
Policy principle 8.1.3: waterways

Development that is located within the floodway and is considered obstructive to major flow is not acceptable as it would increase flood levels upstream. No new dwellings are acceptable within the floodway. Development that is located within the floodfringe is considered acceptable with respect to major flooding. However, a minimum habitable floor level of 0.50m above the adjacent 1:100 annual recurrence interval flood level is recommended to ensure adequate flood protection.

8.2.2 Water, nutrient and soil management

Figure 8 shows key issues for development in the structure plan area relevant to water and nutrient management include:

(i) Public drinking water source area. Although only a small portion of the study area is overlapped by the Jandakot priority 2 source protection area, State Planning Policy 2.7 outlines several policy measures that apply to land within all public drinking water source areas. Priority 2 source protection areas are defined to ensure that there is no increased risk of pollution to the water source and declared over land where low-risk development already exists. Protection of public water supply sources is a high priority in these areas. These areas are managed in accordance with the principle of risk minimisation and so conditional development is allowed. The most relevant one being that land uses and developments in all priority source protection areas that have the potential to impact detrimentally on the quality and quantity of public drinking water supplies should not be permitted unless it can be demonstrated that such impacts can be satisfactorily managed.

(ii) Climate change. Potential symptoms of climate change within the sub-regional plan area may include but not be limited to:

- reduced annual rainfall
- increased frequency and intensity of major storm events
- increased occurrence of temperatures above 40°C
- sea level rise
- increased frequency and intensity of storm surge.

Appropriate management of the risks associated with these changes is critical in all subsequent stages of the development process.

The DoW is expected to include consideration of the likely impacts of climate change on developments within the Murray Drainage and Water Management Plan. This will include a review of available tidal/storm surge water level information. This component involves a review of available information regarding expected tidal storm surge levels in the ocean and Peel Inlet/Harvey Estuary to determine the extent of further work required. Work will include but is not limited to:

- Review of previous work/studies on a local and national scale.
- Collation of relevant tidal/storm surge water level information for Fremantle and Peel Inlet/Harvey Estuary.
- Analysis of data to determine the 5, 10, 25, 100 and 500 year annual recurrence interval tide levels with associated storm surges.
• Assessment of the magnitude of likely wind and wave driven set-up effects on the Peel Inlet/Harvey Estuary water levels.
• Impact of global sea level rise and tsunamis.
• Interpretation of and reasoning for the assumptions used to determine design sea level rise and other factors.

The tidal/storm surge information for the ocean and estuary will be used as a downstream boundary condition for the floodplain mapping component of the study. Where a drainage and water management plan exists, developments should comply with the strategies and objectives presented. In the absence of a drainage and water management plan, individual developments should demonstrate that the potential impact of climate change has been considered and that infrastructure and assets are adequately protected.

(iv) Acid sulphate soils (figure 9). WAPC Planning Bulletin 64/2009 Acid Sulphate Soils provides advice and guidance on matters that should be taken into account in the rezoning, subdivision and development of land that contains acid sulphate soils.

Policy principle 8.1.4: climate change
Proponents of a proposed change in use, including rezoning and/or development, must demonstrate to the satisfaction of the local government and the WAPC, that the potential impact of climate change has been considered and that infrastructure and assets are adequately protected.

Policy principle 8.1.5: acid sulphate soils
At the district and/or local structure plan stage, preliminary site assessments that provide a greater understanding of the risk of acid sulphate soils, must to be submitted for approval.

Policy principle 8.1.6: urban water management
The relevant water management planning process is to be undertaken in support of all future planning and development proposals, in accordance with the Better Urban Water Management guidelines.

8.2.3 Drinking water source protection

Figure 8 identifies the Jandakot public drinking water source area. The state’s public drinking water source are protected and managed by the DoW by using a combination of legislative measures:
• Proclamation under either the Metropolitan Water Supply Sewerage and Drainage Act 1909 or Country Areas Water Supply Act 1947 as a water reserve, catchment area or underground water pollution control area (collectively known as public drinking water source areas).
• Planning controls under the MRS or local planning schemes.
FIGURE 9: ACID SULPHATE SOILS

FEATURES
- Structure plan boundary
- ACID SULPHATE SOILS
  - High to moderate risk of ASS disturbance risk (>3m from surface)
  - Moderate to low ASS disturbance risk (>3m from surface)
  - No known ASS disturbance risk (<3m from surface)
• State planning policies (e.g., 2.7 Public drinking water source, 2.9 Water resources, and 2.3 Jandakot groundwater protection policy).

• Preparation and implementation of drinking water source protection plans (this includes the implementation of existing land use and water management strategies).

The level of protection for a public drinking water source area is determined using a system of land use compatibility linked to protection classification areas and zones.

For land planning and development purposes three protection classification areas (P1, P2 and P3) have been defined based on strategic importance of land or water source, local planning scheme zoning, approved land uses/activities and tenure. Reservoir and well-head protection zones are also defined around areas within the immediate surrounds of reservoirs and water production wells where special by-laws can be applied. These priority areas and protection zones are prepared in consultation with state government agencies, landowners, local government, industry and community stakeholders.

The objectives of the protection classification areas and protection zones are outlined in the DoW's water quality protection note 25 Land use compatibility in public drinking water source areas.

The compatibility of proposed land use developments in a public drinking water source area are guided by State Planning Policy 2.7 (which in turn refers to water quality protection note 25). However, specific state planning policies may be developed that incorporate an individual negotiated land use compatibility guide. This occurred within the Jandakot underground water pollution control area within which State Planning Policy 2.3 applies.

Currently five source protection plans have been developed in the southern metropolitan sub-regional area. A program for the development of the remaining plans will occur after the department has assessed the need for each public drinking water source areas. The implementation of recommendations in these protection plans will help protect water quality now and in the future. In particular, the recognition of proclaimed drinking water sources as special control areas (figure 8) within the MRS and local planning schemes. This approach is supported by State Planning Policy 2.7 for public drinking water sources.

To ensure the ongoing integration of land use planning and drinking water source protection, the following actions should be assessed by the DoW:

1. Review list of public drinking water sources in the southern metropolitan sub-region with a view to prioritising those sources that need a protection plan developed.

2. Implement drinking water source protection plan recommendations to help protect water quality and public health.

3. Work with state and local government planners to show proclaimed public drinking water source areas in the MRS as special control areas, local planning schemes and other planning strategy documents.
The DoW’s drinking water source protection plans, water quality protection notes and other documents related to the management of the state’s drinking water sources can be obtained from the department or viewed on-line at www.water.wa.gov.au select <Drinking water>. Scroll down to the bottom of the drinking water page for quick links to available documents.

8.2.4 Natural areas

The conservation priorities for the structure plan area and the wider sub-region include the continued management of existing protected natural areas, and the identification, protection and management of local natural areas. Figure 10 shows the current extent of native vegetation (categorised by priority for protection in accordance with the 10% and 30% thresholds adopted in national and state policy) within and outside protected areas, as well as declared rare flora, protected fauna, and threatened ecological communities. Key issues for development relevant to natural areas include:

(i) Protected natural areas, comprising Bush Forever sites (on public and private land), regional parks (usually managed by DEC in conjunction with local government) and state conservation estate (managed by DEC).

(ii) Local natural areas, comprising all areas of native vegetation outside protected areas. The highest priority local natural areas for protection are those that meet one or more of the regional significance criteria contained in EPA Guidance Statement No. 10. Planning and decision-making affecting local natural areas should be undertaken in accordance with local biodiversity strategies prepared by local government, as provided for in State Planning Policy 2.8.

(iii) Vegetation complexes where less than 10% of the original extent remains vegetated within the bioregion, or where less than 10% is protected for conservation purposes on the Swan Coastal Plain portion of the Perth metropolitan region, in accordance with EPA Guidance Statement No. 10.

(iv) Vegetation complexes where less than 30% of the original extent remains vegetated within the bioregion, in accordance with EPA Position Statement No. 2.

(v) Threatened ecological communities, including those listed under the Federal Environmental Protection and Biodiversity Conservation Act or recognised at the State level by DEC. Priority ecological communities should also be taken into consideration.

(vi) Threatened flora and fauna species (figure 11), including those listed under the Federal Environmental Protection and Biodiversity Conservation Act or the State’s Wildlife Conservation Act. Priority species should also be taken into consideration.

(vii) Ecological linkages, including those defined by Perth Biodiversity Project for the Perth metropolitan region, and those defined by South West Biodiversity Project for the Peel and South-West regions (figure 12).

---

¹ The recent decision by the DoW not to proclaim the Karnup-Dandalup area as a public drinking water source protection area, should not be construed as suggesting that this area is not subject to the need for drainage and water planning as envisaged in the BUWM and other related policies.
varies according to local government boundaries

- Rockingham (2005)
- Serpentine-Jarrahdale (2007)
- Kwinana (2006)
- Mandurah (2008)

Priority 1 (<10% pre-European extent remaining in the IBRA region)
- Beemulath
- Cannington
- Dandalup
- Forrestfield
- Gwelup
- Serpentine River
- Swan

Priority 2 (<30% pre-European extent remaining in the IBRA region)
- Bassendean Central and South
- Dalling Scarp (G2)
- Herdman
- Karrakatta Central and South
- Guindalup
- Southern River
- Vale

Priority 3
- Cooke
- Collie
- Dalling (G2)
- Dandalup 1 (D1)
- Dandalup 2 (D2)
- Helena 1 (H1)
- Murray 1 (M1)
- Pindalup (Pn)
- Swamp (S)
- Yarralup 1 (Y1)
- Yarralup 2 (Y2)

This summary of the native vegetation extent mapping was developed by the Department for Planning and Infrastructure, South West Biodiversity Program (2007). Source: Western Australian Government (2007) Living with Our Land

FIGURE 10: PRIORITY LOCAL NATURAL AREAS
FIGURE 11: RARE SPECIES and THREATENED ECOLOGICAL COMMUNITIES
FIGURE 12: ECOLOGICAL LINKAGES

Southern Metropolitan and Peel Sub-Regional Structure Plan
Policy principle 8.1.7: protected natural areas
All development must seek to minimise the impact on protected areas.

Policy principle 8.1.8: local natural areas
Any planning or development proposal affecting local natural areas within the structure plan area must demonstrate its compliance with targets for conservation, as contained in the local government’s biodiversity strategy.

Policy principle 8.1.9: threatened vegetation complexes
No further clearing is to occur within the structure plan area for vegetation complexes where less than 10% of the original extent remains vegetated within the bioregion.

Policy principle 8.1.10: under-represented vegetation complexes
Clearing of vegetation complexes is to be minimised within the structure plan area where less than 10% is protected for conservation purposes on the Swan Coastal Plain portion of the Perth metropolitan region, or where less than 30% of the original extent remains vegetated within the bioregion. Development must be located within cleared and degraded areas, or offset by environmental gains elsewhere in the sub-region.

Policy principle 8.1.11: threatened species and ecological communities
Vegetation, flora and fauna surveys must be undertaken at appropriate stages of the planning process, so as to identify the locations of threatened ecological communities, threatened flora species, and habitat for threatened fauna species within the structure plan area. Land use planning must minimise clearing, and retain threatened ecological communities and threatened species within viable natural areas.

Policy principle 8.1.12: ecological linkages
All planning and development proposals for the structure plan area must demonstrate contributions towards the establishment of a network of protected natural areas across the sub-region over the long-term. Contributions may include retention of local natural areas in public open space, formal protection of local natural areas on private property, or management, restoration and re-establishment of native vegetation to form ecological linkages.

8.2.5 Landscape protection and urban design

There are a number of landscape protection and urban design issues that will need to be considered:

(i) Natural landform and visual amenity, including the high coastal dunes along Mandurah Road between Golden Bay and Madora.
(ii) Transit oriented development opportunities.
(iii) Energy and water efficient design of urban areas.
(iv) Opportunities for environmental offsets and enhancement, including possible environmental gains elsewhere in the sub-region to accommodate necessary development within the structure plan area, such as:
• the Karnup station transit oriented development at the Mandurah Road and Paganoni Road intersection, and land contained in the protected area to the south of Paganoni Road;
• linking Anstey Road in Secret Harbour to Henderson Road in Karnup to create improved access for the Karnup area to the coast;
• road access through protected areas to increase north-south road linkages in the Mandurah area between Gordon Road and Paganoni Road.

Policy principle 8.1.13: urban form
Urban structure and built form within the structure plan area must be designed to minimise energy and water usage, and retain the natural landscape features where possible. Subsequent district and local structure plans must provide the most efficient and effective urban form to minimise environmental impact with regard to:
• solar orientation
• increasing use of renewable energy systems
• water management – including protecting water quality, managing water quantity, and integrating stormwater
• water conservation – including use of rain water, re-use and recycling of wastewater, reducing irrigation requirements and promoting opportunities for local supply.
• shading and breezeways
• retention of existing contours
• building materials – sourcing and construction.

Policy principle 8.1.14: environmental offsets and enhancement
Where it is recognised that existing land use arrangements are significantly impeding the efficiency and effectiveness of the urban form, and where opportunities exist to improve the network of protected natural areas within the sub-region, consideration must be given to trade-offs between areas for development and conservation.

8.3 Regional water management strategy
A regional water management strategy is currently being prepared as part of this structure plan. Part one of a two-part regional water management strategy has already been prepared and is the subject of a separate report. This section contains extracts from part one which describes the policy context, design and performance criteria, and key policy principles relating to regional water management. Part two will be developed in parallel with the public consultation process for this structure plan, and will model the drainage and water management implications of the development proposed in the structure plan. The results of this modelling and the implications thereof will be taken into account in the finalisation of this structure plan.
8.3.1 The policy context

State Planning Policy 2.9 and the Better Urban Water Management guidelines describe how land and water planning should be integrated, through the development of water management strategies for each stage of the planning process/cycle (illustrated in figure 13).

Figure 13: Planning framework: integrating drainage and water management planning with land planning processes
Under the Better Urban Water Management guidelines a district water management strategy is required to be prepared by the proponent to support a district level planning proposal such as a district structure plan and related regional scheme amendment. A district water management strategy focuses on post-development scenarios and its primary purpose is to demonstrate that the area is capable of supporting urban development and to identify land areas required for water management.

The Better Urban Water Management guidelines requires that a district water management strategy is informed by a drainage and water management plan, which is usually undertaken by the DoW on behalf of government. The drainage and water management plan describes the pre-development environment and catchment information to guide future land use planning in areas earmarked for development. It establish principles and parameters to ensure the hydrological stability of the catchment during future development.

In areas where drainage and water management plans are proposed, or under preparation, a precautious approach to land use planning is necessary. The DoW's preference is that in such instances (such as the case of the Murray drainage and water management plan) the initiation of amendments to the relevant region planning scheme should not commence until such time as the drainage and water management plan has been significantly progressed, at least to draft for public advertising stage.

For areas where a drainage and water management plan is not proposed in the near future, proponents are typically required to undertake the pre-development studies relevant to their landholding and identify the required principles and parameters derived from those studies as part of a DWMP equivalent DWMS.

Within this context, drainage and water management plans been completed by the DoW for the following locations:
- Byford townsite
- Jandakot structure plan area

Drainage and water management plans and district water management strategies (where drainage studies have been undertaken in conjunction with district structure planning) have also been progressed in several locations:
- Mundijong Whitby
- Murray
- North-East Baldivis

Furthermore, the DoW, in consultation with stakeholders from the development industry, is considering the production of drainage and water management plans in the following areas:
- Serpentine
- Jarrahdale
- Karnup
The Perth-Peel Regional Water Plan will link land and water planning and give key direction for how water should be considered in land planning activities on the strategic level.

**Policy principle 8.2.1: compliance with water management design and performance criteria and strategies**

All water management strategies, structure plans, local planning schemes and subdivision plans prepared for areas of proposed development must demonstrate compliance with the design and performance criteria and strategies articulated in the following sections. No amendments to relevant planning schemes will be considered or made until drainage and water management plans for proposed development areas have been significantly/sufficiently advanced.

8.3.2 Design and performance criteria

The following generic design and performance criteria are to be used as a guide for the development of water management strategies and plans. Other, more detailed design and performance criteria will apply where they have been defined in approved water management strategies and plans. Demonstration of compliance with these design objectives may be through appropriate computer modelling or other assessment methods acceptable to the DoW.

(i) **Protection of environmental assets**

To ensure protection of the numerous water dependent ecosystems in the structure plan area, studies to establish the ecological, hydrological and hydrogeological regimes of these ecosystems and determine appropriate site specific environmental water requirements must be undertaken.

(ii) **Water conservation**

The State Government has identified demand reduction and efficient use of potable water as a priority. The *State Water Plan* sets household consumption targets of less than 100 kilolitres per person per year (kL/person/year) and not more than 40 to 60 kL/person/yr of scheme water.

(iii) **Surface water management**

The one-year, one-hour annual recurrence interval event shall be detained at source for the duration of the event through the use of retention (soakage) or storage devices. Refer to chapter 9 of the *Stormwater Management Manual for Western Australia* for devices suited to the soil types for this catchment. The manual contains guidance for the appropriate design of retention and detention systems.

For the critical one-year annual recurrence interval event, the post development discharge volume and peak flow rates shall be maintained relative to predevelopment conditions in all parts of the catchment. Where there are identified impacts on significant ecosystems, desirable environmental flows and/or hydrological cycles shall be maintained or restored as outlined in this report and approved by the DoW.
The catchment run-off shall be managed for all annual recurrence interval events up to and including the 100 year event within the development area to predevelopment peak flow rates.

Floodways contain the regional 100 year annual recurrence interval event flow. Floodways may not be developed or obstructed in any way.

Developments outside the floodway should ensure finished floor levels at a minimum of 0.5 m above the 100 year flood level.

The existing cross-sectional area of waterways must be maintained. Restoration of waterways is essential and in some cases channel realignments and channel profile modifications may be carried out, provided it is demonstrated that the predevelopment cross-sectional area has been preserved. A permit may be required to alter the beds and banks of waterways under the Rights in Water and Irrigation Act 1914.

Defined major arterial roads should remain passable in the 100 year annual recurrence interval event and minor roads should remain passable in the five-year annual recurrence interval event. Emergency evacuation areas should be defined at least 2.0 m above the 100 year annual recurrence interval event level.

(iv) Groundwater management.

Where a perched water table exists or the predicted maximum groundwater level is at or within 1.2 m of the natural ground level, the importation of clean fill and/or the provision of subsurface drainage will be required to ensure that adequate separation of building floor slabs from groundwater is achieved. In such instances, the subsurface drainage will need to be placed at or above the approved controlled groundwater level.

The bio-retention system and drainage inverts are set at or above controlled groundwater level although existing inverts below the level may remain.

Subsurface drainage is to be installed at or above controlled groundwater level.

Subsurface drainage must be designed with free-draining outlets.

Development should ensure finished lot levels at a minimum of 0.8 m above the phreatic line.

(v) Water quality management.

The Water Quality Improvement Plan for the Rivers and Estuary of the Peel/Harvey System – Phosphorous Management has been developed to address catchment management measures and control actions relating to phosphorus, but does not specify site specific design criteria. Until the outcomes of other investigations are known, and site specific targets have been developed, interim targets will be adopted.
Median loadings of total phosphorus to estuarine waters should be less than 75 tonnes per annum in an average year with:

- The median load of total phosphorus flowing in the estuary from the Serpentine River being less than 21 tonnes.
- The median load of total phosphorus flowing in the estuary from the Murray River being less than 16 tonnes.
- The median load of total phosphorus flowing in the estuary from the Harvey River being less than 38 tonnes.

Water qualities in streams in winter are to meet mean concentrations of 0.1 mg/L TP at current mean flows.

The water quality improvement plan specifies reductions for total phosphorous load and concentration that are required to meet its objectives and recommends the best management practices for urban areas, as contained in table 7:

**Table 7: Recommended water quality best practice (EPA 2008)**

<table>
<thead>
<tr>
<th>Best Management Practice</th>
<th>Recommended Actions</th>
</tr>
</thead>
</table>
| **Residential Fertiliser** | • Use low water soluble fertiliser applied to sandy textured soils, applied sparingly to gardens and turf.  
• Minimise lawn areas or plant an alternative lawn.  
• Fertilise only when symptoms of nutrient deficiency occur e.g. yellowing.  
• Use a complete lawn fertiliser containing nitrogen, phosphorus and potassium, if fertiliser is required.  
• Apply fertiliser at the maximum individual application rate that is 25 grams per square metre for couch and 12 grams per square metre for kikuyu and buffalo grass.  
• If fertiliser is required apply in spring or early autumn (Sept, Oct, Nov, Mar and Apr).  
• Do not fertilise during summer or winter months.  
• Do not over-water |
| **Full sewer connection** | • Connect all new urban developments to sewerage.  
• Build into approvals conditions by decision-making authorities for all new subdivisions and new homes to be connected to reticulated sewerage. |
| **Soil Remediation** | • Ensure all new urban developments in areas with sandy soils undergo soil remediation at the estate scale.  
• At the lot scale blend or apply a layer of higher PRI soil 050 cm beneath the finished ground level to provide increased phosphorus retention.  
• Use soil amendment materials such as yellow Spearwood sands, Karrakatta soils or brown loams.  
• RemEDIATE soil in accordance with Peel/ Harvey coastal catchment water-sensitive urban design technical guidelines.  
• Take care to maintain soil permeability. |
| **Water and Nutrient Sensitive Principles** | • Decision-making authorities should take a lead planning role in incorporating best management practices including water-sensitive urban design principles, criteria and outcomes in its strategic land use planning, policies structure plans and subdivision conditions. |

Table 7 continued on next page
### Best Management Practice

<table>
<thead>
<tr>
<th>Water Sensitive Urban design</th>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Comply with environmental quality criteria should be incorporated in local planning policy</td>
</tr>
<tr>
<td></td>
<td>• Ensure design complies with stormwater management policies</td>
</tr>
<tr>
<td></td>
<td>• Apply water-sensitive urban design treatment trains</td>
</tr>
<tr>
<td></td>
<td>• Prepare water management strategies</td>
</tr>
<tr>
<td></td>
<td>• Undertake soil amendment.</td>
</tr>
<tr>
<td></td>
<td>• Ensure total phosphorus and total nitrogen import and export criteria are met.</td>
</tr>
<tr>
<td></td>
<td>• Meet the minimum percentage area of deep-rooted perennial vegetation</td>
</tr>
<tr>
<td></td>
<td>• Impose building and landscaping covenants</td>
</tr>
<tr>
<td></td>
<td>• Ensure sound construction and building site management.</td>
</tr>
</tbody>
</table>

### Drainage Reform

<table>
<thead>
<tr>
<th>Recommended Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Modify drainage management practices to reduce in-channel sediment movement as opportunities arise.</td>
</tr>
<tr>
<td>• Manage drainage as part of the total water cycle with the dual objectives of optimizing stormwater run-off and reducing nutrient flows into the rivers and streams.</td>
</tr>
</tbody>
</table>

The EPA recognises that there are other problems within the Peel/Harvey system. These include the nitrogen concentrations in estuarine waters; estuarine and riverine habitat loss; acid soil drainage; and bacteria concentrations – animal and human effluent. All of these problems require action.

Further investigations are already underway on these issues and will become components of a catchment management plan, as required in the 1989 environmental conditions, subsequently amended in 1991 and 1993.

Water quality treatment systems and water sensitive urban design structures to meet these objectives must be designed, implemented and managed in accordance with the *Stormwater Management Manual for Western Australia* and *Australian Run-off Quality*.

**(vi) Surface water quality**

The DoW is currently developing water quality targets. In the interim, designs may be based on the methodology established in the *Stormwater Management Manual for Western Australia*.

Targets are to be achieved through adopting a treatment train approach including:

- nonstructural measures to reduce applied nutrient loads;
- onsite retention of one-year one-hour annual recurrence interval events;
- bioretention structures/systems, (also referred to as ‘rain gardens’) to be sized at two per cent of connected impervious areas.

If it is proposed to use a computer stormwater modelling tool to assess a proposed water quality management strategy, the following design targets are recommended:

As compared with a development that does not actively manage water quality, developments must achieve:

- at least 80 per cent reduction of total suspended solids;
• at least 60 per cent reduction of total phosphorus;
• at least 45 per cent reduction of total nitrogen;
• at least 70 per cent reduction of gross pollutants.

(vii) Groundwater quality.

The clean fill imported onto the site is to incorporate a band of material that will reduce phosphorus export via soil leaching, while also meeting soil permeability and soil compaction criteria specified by the local government.

Where development is associated with any new or existing waterway or open drain that intersects the shallow water table, and that may discharge pollutants from the shallow groundwater to receiving environments, the following interim targets will be adopted until such time as appropriate site specific targets are developed:

As compared with a development that does not actively manage water quality, the following should be achieved:

• at least 60 per cent reduction of total phosphorous;
• at least 45 per cent reduction of total nitrogen.

Where development is associated with an ecosystem that is dependent on a particular hydrologic regime for survival, the water quality discharged to the groundwater must be in accordance with the requirements of the DEC.

8.3.3 Key policy principles

The following key policy principles will apply to further planning (district and local structure plans) and development within the sub-regional structure plan area.

(i) Protection of the environmental assets

The sub-regional structure plan area contains a large number of inter-connected conservation category wetlands, resource enhancement wetlands and multiple use wetlands as well as numerous environmental protection policy lakes, rivers, drainage features and underground potable water sources that contribute to the complex hydrology of the area. Surface water management must ensure that urban development does not result in unsustainable changes to the hydrology of receiving environments. Development must also ensure that watercourses and wetlands do not dry out due to over abstraction of water resources or lowering of groundwater levels.

There are numerous declared rare and priority flora and fauna species that inhabit these environments and they also play a critical role in supporting migratory bird populations. To ensure protection of water dependent ecosystems, the ecological, hydrological and hydro-geological regimes of these ecosystems must be maintained by the development of and subsequent compliance with site specific environmental water requirements.

The Aboriginal Heritage Act 1972 recognises Aboriginal peoples’ strong relationships to the land, which may go back many thousands of years. The Act
provides automatic protection for all places and objects in Western Australia that are important to Aboriginal people because of connections to their culture. These places and objects are referred to as Aboriginal sites, are frequently associated with wetlands and waterways and as such these environmental assets have been, and continue to be of particular importance to Aboriginal people.

Changes in land use from rural to urban may lead to local increases in peak flows and volumes of run-off due to increases in impervious area. Large increases in peak flows and volumes have the potential to adversely impact on receiving environments by causing erosion and increasing the period of inundation of vegetation. Surface water management must ensure that urban development does not increase the peak flows discharging to receiving environments although there may be increases in total run-off volumes. Development must also ensure that watercourses and wetlands do not dry out due to over abstraction of water resources or lowering of groundwater levels.

Water management strategies, local structure plans, local planning scheme amendments and subdivision plans prepared in accordance with the Better Urban Water Management guidelines for areas of proposed new development must demonstrate compliance with the following key strategies:

- manage and restore watercourses and wetlands;
- assess and manage impacts on sites of indigenous significance;
- minimise changes in hydrology and hydro-geology to protect water dependent ecosystems;
- assess and manage impacts on native flora and fauna.

**Policy principle 8.2.2: protection of environmental assets**

*Developments must seek to minimise the impact they have on the ecological, hydrological, hydro-geological and social values of environmental assets, and opportunities should be sought to restore and rehabilitate environmental assets wherever possible.*

(ii) **Urban water use**

The State Government has identified demand reduction and efficient use of potable water as a priority. The *State Water Plan* sets an action to reduce annual household use of scheme water in Perth to less than 100 kilolitres per person per year. To achieve an aspirational household consumption of 40 to 60 kL/person/yr of scheme water a third pipe for garden watering using non-potable from either recycled wastewater or groundwater would be required. There are two challenges to this – the substantial cost of an additional third pipe system and the likely additional draw on groundwater which is already under pressure from a drying climate.

Gardens (private and public) and public open space areas need to be waterwise in design to minimise irrigation requirements. Low water requirement plants should be predominantly used and turf areas should be kept to a minimum.

Fit-for-purpose water is often used in applications outside buildings, commonly for maintenance of public open space and passive and active recreation areas. Traditionally demand has been met by groundwater resources.
Development pressure and the drying climate have influenced the need for smarter urban form design and use of water in the urban landscape. Various programs are in place to build in water conservation and efficiency measures for public facilities and space.

The State Water Recycling Strategy identifies opportunities for new housing developments in Western Australia to access a variety of alternative water supplies. Innovative alternative water supply projects will come to the fore in a time when traditional water sources reach maximum allocation limits. Assessment of risk, cost-benefit and practicality of these projects will be critical to the success of alternative water supply proposals.

Water management strategies, local structure plans, local planning scheme amendments and subdivision plans prepared in accordance with the Better Urban Water Management guidelines for proposed new development areas must demonstrate compliance with the following key strategies:

- maintain opportunities for future generations by using water more efficiently;
- ensure the efficient use of all water resources and aim to achieve highest value use of fit-for-purpose water.

**Policy principle 8.2.3: urban water use**

*The design, construction and ongoing management of developed and developing areas must seek to minimise water use and aim to meet the targets of the State Water Plan.*

(iii) Surface water management

Urbanisation results in an increased impervious area. Increased rates and volumes of stormwater run-off must be managed to protect infrastructure and assets from flooding and inundation, while at the same time making use of this water as much as possible so other scarce water resources can be used for public open space or other uses.

Water quantity and quality must be managed to protect wetlands and waterways from risk of increased inundation and contaminant loads. Surface water management must ensure that urban development does not increase the peak flows discharging to receiving environments.

Surface water quantity management is not only restricted to preventing run-off from increasing due to development, but must also manage the maintenance or even restoration of desirable environmental flows and/or hydrological cycles where potential impacts on significant ecosystems such as wetlands are identified.

Where development is associated with an ecosystem that is dependent on a particular hydrologic regime for survival, the water quality discharged to the groundwater must be in accordance with the requirements of the DEC.

Water management strategies, local structure plans, local planning scheme amendments and subdivision plans prepared in accordance with Better Urban Water Management for areas of proposed new development must demonstrate compliance with the following key strategies:

- manage surface water flows from major events to protect infrastructure and assets
- protect wetlands and waterways from the impacts of urban run-off.
Policy principle 8.2.4: surface water management

Surface water from developed areas as well as water from upstream catchments must be managed to protect infrastructure and assets as well as to support and enhance the values of receiving environments (including the urban design principle of infiltration at source).

(iv) Groundwater management

To protect infrastructure and assets from flooding and damage from groundwater, sufficient clearance from maximum groundwater levels must be provided and maintained. However, to ensure that dependent wetlands or waterways are protected, water levels must also be kept above the minimum required to sustain these features as established through allocation plans or otherwise by the DoW.

This may be achieved by the importation of clean fill and/or the provision of subsurface drainage. The selected management method must comply with site specific ecological water requirements of groundwater dependent ecosystems and be in accordance with the requirements of the DoW and the DEC.

Groundwater in the sub-regional structure plan area is currently used for domestic and commercial purposes and is potentially an important source of water for new development in the area. Groundwater management should ensure that the value of groundwater resources are protected and where possible enhanced.

Water management strategies, local structure plans, local planning scheme amendments and subdivision plans prepared for areas of proposed new development must demonstrate compliance with the following key strategies:

- manage groundwater levels to protect infrastructure and assets;
- maintain groundwater regimes for the protection of groundwater-dependent ecosystems;
- manage the shallow aquifer to protect the value of groundwater resources;
- manage groundwater for environmental requirements and possible extraction for non potable water supply.

Policy principle 8.2.5: groundwater management

Groundwater management must provide protection to infrastructure and assets, support and enhance the values of receiving environments and ensure the sustainability of groundwater resources.

(v) Water quality management

To minimise the average annual load of pollutants discharged by stormwater management systems into receiving environments, appropriate site specific targets will be developed and adopted as indicated by the water quality improvement plan for the Rivers and Estuary of the Peel-Harvey system and other investigations underway.

In order to meet these targets, water sensitive urban design and best management practices must not only promote infiltration to aid in prevention of possible local flooding from increased run-off due to urbanisation but must also treat the water prior to its discharge to waterways, wetlands and to groundwater.
Maintaining predevelopment discharge rates and volumes from developed catchments is expected to prevent the majority of contaminants from reaching downstream environments by ensuring that the majority of flows from high-frequency events are retained or infiltrated on site. Provided that the initial flow of more significant events is subject to the same detention and treatment received by high-frequency events, surface run-off that occurs during more significant events represents a lower risk to downstream water quality. This is because nutrients and other contaminants that represent a threat to downstream water quality are typically transported within the first flush of an event.

As well as addressing water quality in the design and management of developed areas it is also critical to ensure that the development process itself does not result in the deterioration of downstream water quality. This should be achieved by careful management of the risks of acid sulphate soil exposure and disturbance of contaminated sites. In addition, the provision of suitable wastewater management facilities will be necessary.

Water management strategies, local structure plans, local planning scheme amendments and subdivision plans prepared in accordance with better urban water management for areas of proposed new development must demonstrate compliance with the following key strategies:

- minimise the average annual load of pollutants discharged by stormwater management systems into receiving environments;
- maintain and, if possible, improve surface and groundwater quality to maintain and restore ecological systems;
- minimise the risk of exposure of acid sulphate soils to the air;
- manage contaminated sites in accordance with the Contaminated Sites Act 2003;
- provide sewerage connection for all new developments.

**Policy principle 8.2.6: water quality management**

The design, construction and ongoing management of developed and developing areas must demonstrate that the environmental values of downstream wetlands and waterways within, and surrounding, the sub-regional structure plan area will be upheld.
9. Traffic and transport

9.1 Technical investigations and staging of new transport infrastructure

Sub-regional traffic and transport issues have been addressed through a sub-regional traffic and transport assessment, which is the subject of a separate report. Using existing regional operational modelling for the sub-region, the study has identified the extent to which the current and planned transport network is able to meet the needs of the projected urban growth to 2031. An indicative staging strategy is presented in section 9.5.

Longer-term and more detailed planning of the movement network, based on strategic transport evaluation modelling (DPI) and regional operational modelling (MRWA) modelling is to commence in 2009, led by DPI in consultation with stakeholders. This exercise will assess the adequacy of the existing and planned strategic transport network, identify gaps, and recommend measures to address any deficiencies.

Policy principle 9.1: staging and developer contributions

A developer contributions plan must be developed. The DPI strategic transport evaluation modelling process due to commence in 2009 will inform the developer contributions plan.

9.2 The movement network

The movement network in the structure plan area must support a balanced transport strategy that provides a safe, efficient and accessible network supporting the movement of passengers and goods.

The movement network must be able to support a significant reduction in car-based travel and increased walking, cycling and public transport mode share. Currently approximately 80 per of travel is by car trips, however studies indicate only half of this is constrained by lack of public transport service, distance to travel or carriage of goods. The urban structure needs to facilitate a substantial increase in shorter, rather than longer trips, for daily activities. This will be through increased overall density and increased local provision for jobs in employment centres of different types.

Attracting members of the public into alternative modes can be facilitated with better land use planning which integrates with the movement network. These factors will combine to reduce pollution and car kilometres travelled while simultaneously producing better public health, environmental outcomes and public transport boardings; contributing to sustainable objectives.

The primary public transport routes (and stops) will provide the backbone of the urban structure, and will determine or strongly influence the location of (regional, arterial and
local) roads, centres and corridors and resident and worker density, to ensure that a major shift to public transport is facilitated.

**Policy principle 9.2: public transport as the backbone to the urban structure**

The existing primary public transport routes and facilities will provide the backbone of the urban structure and will strongly influence the location of the road network, activity centres, activity corridors and resident and worker density.

### 9.3 Public Transport

Planning for public transport modes and routes should be undertaken at the regional and district structure plan level. At these levels the density, mix and distribution of land uses are also established. Detailed design to support the use of public transport services is achieved in the local structure plans and subdivision process.

*Development Control Policy 1.6 Planning to Support Transit Use and Transit Orientated Development and Planning Bulletin 79 Designing Out Crime Planning Guidelines* are relevant, along with Liveable Neighbourhoods.

The Public Transport Authority (PTA) is the peak public transport body. A public transport strategy to 2031 is being prepared by the PTA and is due for completion by the end of 2009. It will define the mass transit network for 2031, determine priorities for investment in infrastructure, rail cars and the bus fleet, examine funding opportunities and consider how the public transport system is influenced by, and can influence urban form.

#### 9.2.1 The public transport network

The Transperth public transport network includes an integrated bus, rail and ferry system which links all services from Mandurah in the south to Yanchep north of Perth. A regional rail service, operated by Transwa, also runs between Bunbury and Perth. This service enables inland passengers in the Shires of Murray and Serpentine Jarrahdale the opportunity to travel twice daily on the Australind.

#### 9.2.2 Current and projected passenger rail operations

The Perth-Mandurah rail line is the primary urban public transport spine in the sub-region. It currently has five stations at Mandurah, Warnbro, Rockingham, Wellard and Kwinana.

The Mandurah line has had a significant impact on commuter patterns and travel trends since its opening in December 2007. In its first year of operation it reached 96% of projected demand, and it will to continue to play a significant role in the future as new stations and additional railcars are added to the system.
The service operates three and six car sets every ten minutes during the AM and PM peak periods and every 15 minutes at inter peak times. It is capable of handling 22,000 passengers per hour, though this would require significant investment in stations, railcars and interchange facilities. The current peak passenger numbers are 7,000 per hour – meaning that the railway line is capable of carrying three times the current peak hour passenger numbers.

As was indicated in section 7 (table 6) of this report, a business as usual scenario in employment projections suggests that overall commuting into and out of the sub-region for work will more than double by 2031, and would be less than double if employment self-sufficiency and employment self-containment can both be increased. At current levels of commuter capture, the train would be operating at between 50% and 60% of ultimate capacity by 2031.

While recognising that not all employment opportunities will necessarily be located at individual employment centres, structuring strategic employment opportunities at activity centres located along the transport corridor is likely to reduce commute out of the sub-region, facilitating a more efficient two way use of the rail service.

Rail stations need to provide bus interchanges, car parking and kiss and ride facilities as well as encourage pedestrian and cyclist users and accommodate short and long journeys. Local structure plans and subdivision plans encompassing rail precincts need to accommodate these intermodal facilities to assist in meeting service capacity and community expectation.

9.2.3 Future rail stations and linkages

Integrating land use with public transport to accentuate the principles of Liveable Neighbourhoods in activity centres and to provide connection points along the activity corridors, as defined in section 4.2, will facilitate potential expansion of rail passenger services as population increases. Transit oriented development facilities, or specialised activity centres, at some rail stations will form an important element of the transit and land use system.

Potential stations may be considered at Karnup, Stakehill and Mandogalup following extensive investigation of environmental and engineering issues, passenger demand modelling and the impact on railway operations. Within the 2031 timeframe, Karnup and Mandogalup present the most likely opportunities for station development.

9.2.4 Bus Services

A reliable, frequent and high amenity bus service, together with appropriate ancillary services such as seating, shelter and good levels of personal safety, is central to increased public transport patronage and providing a viable alternative to private transport usage.

Consultation with the PTA at an early stage of district and local structure plan design is required to enable most efficient use of the street network and to encourage public transport patronage.
Subject to the scale and density of urban development in the Baldivis area, a more frequent bus service with on-road infrastructure priority may be needed to access a future Stakehill station. Within Rockingham, a new transit system is being implemented to link Rockingham station with the medium-higher density developments on the coast and in the emerging city centre. In the longer term, this could be further developed to a light rail service.

**Policy principle 9.3: strengthening public transport**

*Planning must facilitate the continued strengthening of public transport infrastructure and services. It is important that the public transport system provides a viable alternative to the private vehicle and, where needed, priority is given for buses at key pressure points on the road network (eg access to railway stations and though major intersections).*

**Policy principle 9.4: strategic employment**

*Strategic employment must be encouraged and integrated along the transport corridor, and concentrated at activity centres to facilitate more efficient use of rail services and bus feeder systems.*

**Policy principle 9.5: intermodal facilities**

*District and local structure plans will incorporate Liveable Neighbourhood principles to encourage public transport patronage and facilitate a reduction in car based travel.*

### 9.4 Regional road network

The regional road network plays a fundamental role in catering for inter and intra-regional traffic and road freight. The responsibility for the planning of regional roads rests with DPI, and the approval thereof, with the WAPC. The implementation, construction and maintenance of the primary regional roads is the responsibility of MRWA, while the implementation, construction and maintenance of the other regional roads is the responsibility of the respective local governments. The Commissioner of Main Roads retains the responsibility for the approval of access points onto controlled access freeways. The proposed regional road network is shown in figure 14.

#### 9.4.1 Primary regional roads

(i) **Kwinana Freeway/Perth-Bunbury Highway:** The opening of this regional road in mid-2009 will provide a four-lane controlled access freeway standard road between Perth and Bunbury. This regional road has been planned to cater substantially for longer distance regional traffic rather than local traffic, and controlled access points are planned for Anstey Road, Karnup Road, Paganoni Road, Mandurah Access Road, Lakes/Gordon Road, Pinjarra Road, Greenslands Road and Heron Road. Any additional access points would be subject to approval by the Commissioner of Main Roads and subject to Commonwealth Government environmental assessment through the *Environmental Protection And Biodiversity Conservation Act 1999*. This latter aspect is one of the environmental conditions attached to the Perth-Bunbury Highway. Development adjacent to the Perth-Bunbury Highway must have an efficient local transport network that provides suitable access without requiring the use of the highway for localised travel.
FIGURE 14: REGIONAL ROAD NETWORK

FEATURES:
- Structure plan boundary
- Primary regional roads
- Other regional roads

Source: base data supplied by the Western Australian Land Information Authority, GL248-2007-2
(ii) **Tonkin Highway:** is currently constructed as a four-lane controlled access road, to Thomas Road. There is a road reservation from Thomas Road to Mundijong Road at which point it is planned that Tonkin Highway will then link into the South Western Highway.

(iii) **South Western Highway:** is the primary north-south road corridor for areas located to the east in the structure plan area. This route provides an important regional function and carries a significant number of heavy vehicles. Any future development along the South Western Highway will need to be carefully planned and managed to ensure that it does not compromise the regional transport function of this route. In the future there may be a need to plan for some deviations around some of the built areas.

(iv) **Mandurah Road/Ennis Avenue:** this coastal corridor provides an important regional function separate from the function of the Perth-Bunbury Highway. Even with the Perth-Bunbury Highway constructed, this road will continue to carry significant volumes of traffic and therefore it is important that the regional transport function of this route is protected. Proposed development along this road will require access from side/rear roads.

(v) **Thomas Road:** MRWA has taken over the responsibility for this road between the Kwinana Freeway and Tonkin Highway, and it is proposed that this road be upgraded to a primary regional road to reflect its importance as a major freight route.

(vi) **Rowley Road and Anketell Road:** are both considered to be major freight routes to support the Kwinana industrial area, Australian Marine Complex, Latitude 32, Kwinana quays, and the planned James Point private port. The structure plan proposes both of these roads as primary regional roads.

(vii) **Mundijong Road:** the structure plan proposes this road as a primary regional road over its entire length from the South Western Highway to Rockingham to reflect its importance as a freight route. A proposal is currently under consideration to connect this road directly into the proposed Fremantle Rockingham controlled access highway as part of the process of increased/improved freight access into the various industrial complexes.

(viii) **Pinjarra Road (east of Mandurah Road):** this road remains a primary regional road.

(ix) **Greenlands Road:** this road is to be upgraded to a primary regional road, and is an important direct east-west link between the South Western Highway and the Perth-Bunbury Highway.

(x) **Pinjarra West Bypass:** this proposed road has been removed from the structure plan. It has been agreed that this road is no longer required with the advent of the upgrading of Greenlands Road.

(xi) **Pinjarra East Bypass:** A revised alignment at the southern end is currently under consideration

**Policy principle 9.6: primary regional road network**

The primary regional road network has been planned to cater for regional traffic rather than local traffic, and the location and construction of controlled access points on this regional network is subject to approval by the Commissioner of Main Roads WA and further subject to the Commonwealth Government environmental assessment process.
through the Environmental Protection And Biodiversity Conservation Act 1999. All district and local structure plans are to reflect the primary regional road network and associated functions.

9.4.2 Other Regional Roads

The structure plan proposes the following roads as other regional roads:

(i) Wellard Road and Gilmore Avenue in the Town of Kwinana.

(ii) Read Street, Warnbro Sound Avenue, Anstey Road, Mandurah Road, Eighty Road, Safety Bay Road, Stakehill Road, and Paganoni Road in the City of Rockingham.

(iii) Gordon Road, Mandurah Terrace, Pinjarra Road (West of Mandurah Road), and Old Coast Road in the City of Mandurah.

(iv) Lakes Road in the Shire of Murray.

(v) Thomas Road (east of Tonkin Highway) in the Shire of Serpentine Jarrahdale.

Policy principle 9.7: other regional roads

Other regional roads may need to play a combination of collector and distributor functions, as determined by the DPI in consultation with the respective local governments and with due consideration to the structure plan proposals, the need for public transport and the traffic volumes. All district and local structure plans are to reflect the other regional road network.

9.5 Regional road network assessment and staging of new transport infrastructure

The assessment of the capacity of the regional road network has been based on the regional operational modelling, the latest output from which was based on revised WA Tomorrow population data, incorporating estimates of residential growth in different parts of the local government areas in a pre-structure plan scenario.

Once this structure plan is adopted with its final development proposals, the new information on development areas, population projections, employment projections, and areas of economic activity, will be introduced into the strategic transport evaluation modelling process to be managed by the DPI. This exercise will assess the adequacy of the existing and planned strategic transport network, identify gaps, and recommend measures to address any deficiencies.

9.5.1 The current and planned regional road network to 2021

The MRWA regional operational modelling indicates that acceptable operation of all regional roads is expected to 2021, although levels of service on the Kwinana Freeway north of Safety Bay Road, Mandurah Road (from Paganoni Road to the estuary bridge) and Gordon Road (west of the Perth-Bunbury Highway) will have reached levels of
service close to the limit of stable flow (drivers severely restricted to select desired speed and achieve manoeuvrability in traffic). There are certain key actions required:

(i) Construction of the Mandurah entrance road as a four-lane divided carriageway will be a crucial project in this period, and will have a significant impact throughout the network.

(ii) Widening of Mandurah Road is not indicated in this period under the regional operational modelling results.

(iii) Widening of the Kwinana Freeway in this period is not indicated under the regional operational modelling results.

9.5.2 The current and planned regional road network: 2021 to 2031

The MRWA regional operational modelling indicates that by 2031, poor operation of the regional road network can be expected in a number of key locations. These include:

(i) Widening of Mandurah Road to six lanes from Paganoni Road to the Estuary Bridge is indicated in order to ensure acceptable levels of service, although the modelling is also indicating that the lack of sufficient north-south roads links between Paganoni Road and Mandurah will continue to put pressure on that section of Mandurah Road. Planning decisions on the role and function of Mandurah Road, the possible establishment of a significant public transport (bus) link on this road, progress with employment creation in the sub-region, and the proportional share of the commuter market using the Mandurah rail service, will combine to significantly influence the actual conditions.

(ii) The regional operational modelling shows that widening of the Kwinana Freeway and Perth-Bunbury Highway to six lanes from Paganoni Road northwards will return the freeway to acceptable levels of operation – although this will simply have the effect of further congestion on the freeway in its approaches to the Perth central business district (where similar widening will not be possible). As with Mandurah Road, the actual situation will be significantly influenced by the sub-regions ability to grow its employment base, as well as the extent to which commuters might make the shift to public transport (train and bus) as an option to car-based travel.

(iii) Regional operational modelling shows Lakes Road East failing to operate to acceptable levels by 2031 as a single carriageway road. As part of the planning for the Kwinana Freeway and Perth-Bunbury Highway, Lakes Road East has been identified as requiring a four-lane divided road into Mandurah.

(iv) Regional operational modelling indicates a localised problem with the South Western Highway immediately south of Mundijong. Completion of the Tonkin Highway through to its junction with the South Western Highway is indicated.

Policy principle 9.8: staging of road infrastructure improvements

While a number of improvements to the road transport infrastructure network are indicated in the period to 2031, these must be continuously evaluated against ongoing strategic transport evaluation modelling and against the evolving performance of the public transport system. Where the public transport system is capable of accommodating excess peak flows on key routes, expenditure on new road infrastructure should focus on optimising the use of existing road infrastructure.
10. Activity centres and activity corridors

10.1 Activity centres: definition and type

Broadly defined, activity centres are “community focal points for people, services, employment and leisure that are highly accessible. Key characteristics include their levels of diversity, accumulation of activities and access to public transport. Commercial, retail, higher density living, entertainment, tourism, civic/community, higher education, and major or specialised medical services are just a few such activities”.

In the context of this structure plan, an activity means a transaction or exchange of goods and/or services. These activities vary according to the environment within which these transactions or exchanges take place, such as city or town centres precincts (eg commercial including office and retail activities and cultural/civic activities), institutional precincts (health and/or educational activities), industrial precincts, and recreational precincts.

The configuration of these activity centre precincts may vary between single compact nodes or a centre of activities dispersed across a number of proximate nodes. Similarly, the shape of these activity centre precincts may vary widely from roughly circular to a linear or irregular shape.

Certain existing activity centres may be comprised of a limited combination of land use functions, such as health related functions such as hospitals and universities, or a recreation related functions such as parks, conservation areas or sporting facility. These activity centres may have been inadvertently isolated from other compatible activities due to historical availability, or may be intentionally isolated due to the potential for land use conflict, such as major industrial precincts with manufacturing processes requiring noise or other buffers.

In planning for existing and new activity centres in the sub-region, there are a number of important policy principles that are required to be addressed:

**Policy principle 10.1: equitable access of activity centres according to position in the hierarchy**

Activity centres must be located so as to provide equitable access to goods and services throughout the structure plan area in accordance with its position in the hierarchy.

**Policy principle 10.2: strong public transport connections**

Activity centres must be connected by activity corridors to ensure maximum accessibility by public transport, ie they must be connected by a good level of public transport service.

The agglomeration of compatible land uses and activities within activity centres improves access to goods and service opportunities and contributes to the increased viability of services provision such as public transport and a range of community facilities and amenities.
Policy principle 10.3: **encourage agglomeration of compatible land uses/activities within activity centres**

Activity generating land uses must be encouraged to concentrate within identified activity centres, to maximise the agglomeration advantages, synergies and convenience, and to minimise the number and length of trips undertaken (particularly those by private motor vehicle).

Policy principle 10.4: **encourage diversity within activity centres**

Activity centres must be encouraged to attract and serve a wide diversity of complementary land use functions to maximise the positive externalities associated with the co-location of complementary land uses and to provide for employment diversity.

10.2 **Activity centres hierarchy**

The metropolitan spatial framework – Directions 2031- designates the Perth central area as the highest level of activity centre. The subsequent levels in the hierarchy within the southern metropolitan sub-region are described in table 8 and shown in figure 15.

Table 8: The activity centres hierarchy of the southern metropolitan and Peel regions

<table>
<thead>
<tr>
<th>Activity centre hierarchy</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary centre</td>
<td></td>
</tr>
<tr>
<td>– City of Rockingham</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This primary centre is the highest order of centre in the sub-region, and will attract the highest order of activities (eg both high and low order) across the full range of functions (ie goods, services, employment and amenity) required by the resident population, visitors and workers within the large service catchment.</td>
</tr>
<tr>
<td>Strategic city centre</td>
<td></td>
</tr>
<tr>
<td>– City of Mandurah</td>
<td></td>
</tr>
<tr>
<td>Strategic industrial centres</td>
<td></td>
</tr>
<tr>
<td>– Kwinana, Latitude 32, Henderson, Oakley</td>
<td>The term strategic designates Mandurah as a centre providing a full range of services, facilities and activities to support a large catchment.</td>
</tr>
<tr>
<td>Regional town centres</td>
<td></td>
</tr>
<tr>
<td>– towns of Kwinana and Pinjarra</td>
<td>The regional designation of these towns indicates that they are destined to serve the traditional town centre role with service catchments that serve the weekly and monthly requirements of the resident population, visitors and workers.</td>
</tr>
<tr>
<td>Regional industrial centres</td>
<td></td>
</tr>
<tr>
<td>– Nambeelup, East Rockingham, East and West Mundijong</td>
<td>Primarily focused on providing industrial products and services in the metropolitan region. Including manufacturing, processing, fabrication and overseas export.</td>
</tr>
<tr>
<td>District centres</td>
<td></td>
</tr>
<tr>
<td>– Balddivis, Karnup, Byford, Halls Head, Lakelands, Falcon and Mundijong</td>
<td>These centres contain a lesser proportion of activities and functions serving smaller population catchments than the preceding levels in the hierarchy, with a high proportion of activities to serve the weekly requirements of the resident population, visitors and workers within their respective service catchments.</td>
</tr>
<tr>
<td>District industrial centres</td>
<td></td>
</tr>
<tr>
<td>– Gordon Road, Pinjarra, Port Kennedy, Rockingham</td>
<td>Primarily focused on the provision of general and light industrial services and products to meet the needs of the local population.</td>
</tr>
<tr>
<td>Neighbourhood centres - various</td>
<td>Important local community focal points performing a vital role in providing for the main daily shopping and community needs. Primarily within walkable catchments.</td>
</tr>
<tr>
<td>Local centre – various</td>
<td>Incidental convenience shopping needs of local communities within walkable catchments.</td>
</tr>
</tbody>
</table>
FIGURE 15: ACTIVITY CENTRE HIERARCHY
The designation of a hierarchy of activity centres serves two key purposes:

- Firstly, at a strategic planning level, to establish a policy position that guides decision-making on the level and type of investment in and development of land and infrastructure in central areas and key locations within the sub-region.
- Secondly, to facilitate decision-making on the consolidation or expansion of existing activity centres and the location of new activity centres to accommodate the various land use functions on a level consistent with each activity centres place in the hierarchy.

10.2.1 The activity centres hierarchy informs strategic planning, development and investment decisions

A distinct hierarchy of urban areas has emerged across the Perth metropolitan and Peel regions, reflecting amongst others, past population growth and urban development, land use decisions, levels of decentralisation of activities out of the metropolitan core, levels of strategic investment and employment creation, and the development of major transport infrastructure. This has given rise to urban areas of varying scale, functional complexity and economic capability, which informs decision-making on future planning, investment and development of land and infrastructure in the sub-region, by both the public sector and the private sector.

**Policy principle 10.5: activity centre hierarchy designation to guide decision-making**

The designation of activity centres in the hierarchy provides a state government policy position that aims to guide decision-making on the level and type of investment in and development of land and infrastructure in central areas and key locations within the sub-region.

10.2.2 The activity centres hierarchy informs decision-making on the scale and type of land and infrastructure development of existing activity centres and of the location of new activity centres on the desirability of accommodating various land use functions at a level consistent with the designated position of each activity centre in the hierarchy

The designation of a hierarchy of activity centres also aims to encourage the following:

- efficiencies in transactions within the urban economy;
- equitable access by communities to a range of services and goods;
- concentration of activities that encourage strong agglomeration economies and facilitate employment; and
- concentrations of activities that can be better serviced by public transport.
Policy principle 10.6: designation of the activity centres land use function

Activity centres in the structure plan are designated in accordance with their land use function, i.e. relating to the following: central city/town with its predominant retail and commercial functions, including cultural/civic land uses, institutional (health and/or educational land uses), industrial (varying by type of operation and service area), and recreational (varying by service catchment and type and scale of facilities). These activity centre designations must be reflected in the more detailed district and local structure plans, and be included in the MRS and local planning schemes.

Goods and services have a population threshold

The minimum population required to justify the provision of certain goods or services is referred to as the population threshold, and high order goods and services have a higher threshold population and generally provide a wider range as opposed to that of lower low goods and services. Examples of high order goods include those of a higher value or importance such as furniture, electrical goods, and financial expertise, whereas low order goods demonstrate the converse, having a low threshold population and range of goods and include convenience goods such as newspapers or bread. Similarly, services exhibit an increasing threshold population as the sophistication of the service provided increases; e.g., from a single GP, to a group practice or clinic, to a hospital with consultants, and finally to a specialist hospital, such as Princess Margaret children’s hospital.

The highest ranking activity centres, being Rockingham and Mandurah respectively, will contain land use activities ranked as primary across all the land use functional designations. Similarly, activity centres with the lower regional and district activity centre designations will contain land use activities ranked as secondary across all the land use functional designations. And, the lowest ranked activity centres, being neighbourhood and local will contain land use activities ranked as local across all the land use functional designations. This is captured in table 9.

Policy principle 10.7: ranking of land uses within the activity centres hierarchy

Each land use within activity centres is positioned in a hierarchy in accordance with its level of operation or service offering, which is in direct proportion to the size of the activity centres service catchments.

Policy principle 10.8: identification and early securing of sites for activity centres

In planning for future development, sites with characteristics required for specific functions and activities (as is shown in table 9) need to be identified and secured in advance of urban development and must remain reserved and suitably protected (in terms of the MRS, PRS and local schemes). In the above regard due cognisance must be given to:

- The function and size of the activity centre, the population it is to serve, and the influence of, and impact on, existing and proposed activity centres within the same catchment area.
- The nature of the processes within the activity centre and the need for buffers or other specific location requirements.
- The type of employment (population-driven or strategic) within the activity centre.
**Policy principle 10.9:** permitted land uses in activity centres, and the location of activity centres

The highest level of land use permitted in the different types (function) of activity centre, for all centres from the primary centre to district centres inclusive, is summarised in table 10. The indicative location of the major activity centre precincts in the cities of Rockingham and Mandurah, and the towns of Kwinana and Pinjarra are shown in figures 16(a), 16(b), 16(c) and 16(d). These activity centres designations must be reflected within the more detailed district and local structure plans, and be included within the MRS and local planning schemes.

**Table 9: The ranking and description of land use activities in the activity centres hierarchy for the southern metropolitan sub-region**

<table>
<thead>
<tr>
<th>Activity centre hierarchy by function</th>
<th>Ranking of land use activities</th>
<th>Description of land use activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary city</td>
<td>Primary</td>
<td>Mixed use centre servicing large catchment. Similar retail activities to strategic centre. Major offices, commonwealth and state government agencies. Major sport stadiums, hotels, museums, concert halls, theatres and cultural institutions High level and range of government, administrative, commercial and retail, civil and cultural functions. Substantial amount of higher density housing with a range of housing choices</td>
</tr>
<tr>
<td>Strategic city centres</td>
<td>Primary</td>
<td>Mixed use centre servicing large catchment. Similar retail activities to regional town centre but at larger scale. Major offices and state government agencies. Sporting arenas, museums, concert halls, theatres, cultural institutions. Hotels, regional sport, recreation, entertainment and community facilities. Substantial amount of higher density housing with a range of housing choices</td>
</tr>
<tr>
<td>District town centres</td>
<td>Secondary 2</td>
<td>Mixed use centre. Discount department store, supermarkets, convenience goods, personal services, some comparison shopping, mixed business/showrooms. District level office development and local professional services. Libraries, social services, health, sport and other community facilities. Some higher density residential development with housing choice.</td>
</tr>
<tr>
<td>Neighbourhood centres</td>
<td>Local 1</td>
<td>Supermarket, convenience goods and personal services. Local professional services, community facilities and civic spaces. Doctors consulting rooms and minor medical clinic.</td>
</tr>
<tr>
<td>Local centres</td>
<td>Local 2</td>
<td>Small retail facilities providing for limited incidental convenience shopping needs and situated within walkable catchments.</td>
</tr>
</tbody>
</table>

Table 9 continued on next page
<table>
<thead>
<tr>
<th>Activity centre hierarchy by function</th>
<th>Ranking of land use activities</th>
<th>Description of land use activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Institutional (health and educational)</td>
<td>Primary</td>
<td>Major health centres with major medical facility such as a hospital with a research function. One or more major tertiary facility such as a full university campus and/or TAFE associated land uses and regional library. Where such an activity centre is situated in isolation, compatible primary city centre land uses may locate within the activity centre, within limits to be set.</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>District hospital or health centres with medical facilities such as clinics and/or minor medical centres. Tertiary educational facility such as a regional branch of university campus and/or a regional branch of a TAFE and district library. Where such activity centres exist in isolation, compatible secondary city centre land uses may locate within the activity centre, within limits to be set.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td>Doctors consulting rooms or minor medical centre. High schools, primary schools and childcare facility. To be located in accordance with Liveable Neighbourhoods policy</td>
</tr>
<tr>
<td>Strategic industrial centre</td>
<td>Primary</td>
<td>Major industrial precinct serving state, national and international markets. Potentially high levels of impact on surrounding land uses. Substantial proportion of knowledge-intensive and export related jobs. Compatible primary city centre land uses may locate within these activity centres, within limits to be set.</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>Light industrial precinct. Light manufacturing at a predominantly metropolitan level. May impact on surrounding land uses depending on processes. Mixed population-driven and knowledge-intensive/export related jobs. Compatible secondary (1 and 2) town centre land uses may locate within these activity centres, within limits to be set.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td>Service industrial needs of local population. Proximity to residential areas and public transport. Largely population driven employment. Located in or near city and town centres. Where these activity centres are located in isolation, compatible local centre land uses may locate within these activity centres, within limits to be set.</td>
</tr>
<tr>
<td>Sport/recreational</td>
<td>Primary</td>
<td>Regional sport/recreational facilities. Where such an activity centre is situated in isolation, compatible primary city centre land uses may locate within the activity centre, within limits to be set.</td>
</tr>
<tr>
<td></td>
<td>Secondary</td>
<td>City or town sports/recreational facility. Where such an activity centre is situated in isolation, compatible secondary (1 and 2) town centre land uses may locate within the activity centre, within limits to be set.</td>
</tr>
<tr>
<td></td>
<td>Local</td>
<td>Local sports/recreational facility to be located in accordance with Liveable Neighbourhoods.</td>
</tr>
</tbody>
</table>
Table 10: Indicative highest level of land use permitted within the primary centre, strategic centre, regional centres and district centres.
(note the designated higher land use activities also contain the land use activities of the lower ranking locations)

<table>
<thead>
<tr>
<th>Activity centre function</th>
<th>Rockingham Primary Centre</th>
<th>Mandurah Strategic Centre</th>
<th>Kwinana Regional Centre</th>
<th>Pinjarra Regional Centre</th>
<th>Byford District Centre</th>
<th>Baldivis District Centre</th>
<th>Karnup District Centre</th>
<th>Lakelands District Centre</th>
<th>Falcon District Centre</th>
<th>Halls Head District Centre</th>
<th>Mundijong District Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>primary</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>secondary 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Southern Metropolitan and Peel Sub-Regional Structure Plan
Table 10: Indicative highest level of land use permitted within the primary centre, strategic centre, regional centres and district centres.  
(note the designated higher land use activities also contain the land use activities of the lower ranking locations)  
Continued

<table>
<thead>
<tr>
<th>Activity Centre Hierarchy</th>
<th>Rockingham Primary Centre</th>
<th>Mandurah Strategic Centre</th>
<th>Kwinana Regional Centre</th>
<th>Pinjarra Regional Centre</th>
<th>Byford District Centre</th>
<th>Baldivis District Centre</th>
<th>Karnup District Centre</th>
<th>Lakelands District Centre</th>
<th>Falcon District Centre</th>
<th>Halls Head District Centre</th>
<th>Mundijong District Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity centre function</td>
<td>Land use activity ranking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Institutional (health)</td>
<td>secondary existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>local</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10: Indicative highest level of land use permitted within the primary centre, strategic centre, regional centres and district centres.
(note the designated higher land use activities also contain the land use activities of the lower ranking locations) Continued

<table>
<thead>
<tr>
<th>Activity Centre Hierarchy</th>
<th>Activity centre function</th>
<th>Rockingham Primary Centre</th>
<th>Mandurah Strategic Centre</th>
<th>Kwinana Regional Centre</th>
<th>Pinjarra Regional Centre</th>
<th>Byford District Centre</th>
<th>Baldivis District Centre</th>
<th>Karnup District Centre</th>
<th>Lakelands District Centre</th>
<th>Falcon District Centre</th>
<th>Halls Head District Centre</th>
<th>Mundijong District Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>primary existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>institutional (education)</td>
<td>secondary existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>local</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10: Indicative highest level of land use permitted within the primary centre, strategic centre, regional centres and district centres.
(note the designated higher land use activities also contain the land use activities of the lower ranking locations) Continued

<table>
<thead>
<tr>
<th>Activity Centre Hierarchy</th>
<th>Rockingham Primary Centre</th>
<th>Mandurah Strategic Centre</th>
<th>Kwinana Regional Centre</th>
<th>Pinjarra Regional Centre</th>
<th>Byford District Centre</th>
<th>Baldivis District Centre</th>
<th>Karnup District Centre</th>
<th>Lakelands District Centre</th>
<th>Falcon District Centre</th>
<th>Halls Head District Centre</th>
<th>Mundijong District Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity centre function</td>
<td>Land use activity ranking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>industrial</td>
<td>secondary</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>local</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 10: Indicative highest level of land use permitted within the primary centre, strategic centre, regional centres and district centres.
(note the designated higher land use activities also contain the land use activities of the lower ranking locations) **Continued**

<table>
<thead>
<tr>
<th>Activity Centre Hierarchy</th>
<th>Rockingham Primary Centre</th>
<th>Mandurah Strategic Centre</th>
<th>Kwinana Regional Centre</th>
<th>Pinjarra Regional Centre</th>
<th>Byford District Centre</th>
<th>Baldivis District Centre</th>
<th>Karnup District Centre</th>
<th>Lakelands District Centre</th>
<th>Falcon District Centre</th>
<th>Halls Head District Centre</th>
<th>Mundijong District Centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity centre function</td>
<td>Land use activity ranking</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>primary</td>
<td>existing</td>
<td>[Image]</td>
<td>[Image]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td>[Image]</td>
<td>[Image]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>recreational</td>
<td>secondary</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>local</td>
<td>existing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>proposed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
FIGURE 16a: ROCKINGHAM PRIMARY CENTRE

ROCKINGHAM PRIMARY CENTRE
Indicative location of Main Activity Centre Precincts

Features:
- Indicative location of Activity Centres
  - Primary City Centre Precinct
  - Regional Industrial Centre Precinct
  - Institutional: Educational Centre Precinct (Primary land use)
  - Institutional: Health Centre Precinct (Primary land use)
MANDURAH STRATEGIC CENTRE
Indicative location of Main Activity Centre Precincts

FEATURES
Indicative location of Activity Centres

- Strategic City Centre Precinct
- District Industrial Centre Precinct
- Institutional: Educational Centre Precinct (Primary land use)
- Institutional: Health Centre Precinct (Primary land use)
FIGURE 16c: KWINANA REGIONAL CENTRE

KWINANA REGIONAL CENTRE
Indicative location of
Main Activity Centre Precincts
FIGURE 16d: PINJARRA REGIONAL CENTRE

PINJARRA REGIONAL CENTRE
Indicative location of
Main Activity Centre Precincts

FEATURES
Indicative location of Activity Centres

- E  Institutional: Educational Centre Precinct (Secondary land use)
- H  Institutional: Health Centre Precinct (Secondary land use)

Regional City Centre Precinct
Strategic Industrial Centre Precinct
District Industrial Centre Precinct
10.2.2 Managing activity centres

(i) Context

Directions 2031 defines the hierarchy and distribution of activity centre types to achieve an equitable distribution of goods, services and amenities for the benefit of activity centre users.

The urban centres are organised into a hierarchy. Each level of the hierarchy exhibits a set of characteristics, comprising its spatial size, employment, activity diversity, activity intensity and centre accessibility.

The performance of the designated activity centres will be measured in terms of these characteristics, and the performance of each activity centre will inform the local and state government management and decision-making on the development of land and infrastructure within each of these centres.

The successful realisation of the activity centre network as shown in figure 15 requires investment in and effective management of the development of land and infrastructure within each of the activity centres. This management will include the application of specific sets of interventions (controls, incentives, guidelines etc.) that aim to guide the operation of each activity centre so that it contributes to the implementation of the activity centre network as a whole. Metrics are to be applied to measure progress towards an optimal state.

In general, higher order centres in the hierarchy must achieve higher standards against these characteristics, and therefore these activity centres must be larger in spatial extent (area); while lower order centres are expected to achieve lower standards and therefore will be smaller in size. Further, higher order centres will attract greater investment (public and private) and will serve larger service catchments.

The arrangement of these activity centres within a hierarchy supports increased efficiencies and lower transaction costs within the urban economy which facilitates equitable access to goods and services across the community. This is achieved through the nesting of lower order centres within the catchments of higher order centres. For example the day to day goods and service requirements of the community need to be located within close proximity; therefore these service catchments are smaller than those catchments servicing the higher order week to week or monthly requirements.

A key characteristic of activity centres is activity diversity. Activity diversity is divided into specific activity types that equate to typical land use classifications, which are commonly used to describe activity centre functions. Centres include a range of land uses such as: commercial (retail and office), institutional (health and education), industrial, recreational, and cultural and civic, which are most often co-located to form a mix of these land uses that give rise to a range of activity types. As a consequence, the functions and inter-relationships within and between these activity centres are generally more complex than that allowed for in the current policy environment.
(ii) Policy objectives

The structure plan articulates a set of policy objectives and principles for the five key characteristics identified, in order to:

- guide investment and development decision-making by local and state government;
- optimise the planning, development and management of activity centres.

Employment

This characteristic recognises the importance of employment concentration and diversity in nominated activity centres. The employment concentration and diversity of an activity centre will vary in accordance with its place in the hierarchy.

Objectives

Whereas previous policies have guided the development of centres primarily on the basis of floor space and limits thereto, this policy aims to enhance local employment outcomes.

- Maximise employment concentration and diversity in nominated centres according to its position in the hierarchy to lift employment self-sufficiency to a sustainable level for the sub-region.
- Maximise the high quality employment content for nominated centres in accordance with their position in the hierarchy.

Policy principle 10.10: maximise employment concentration, employment diversity and employment quality

Activity centre plans, local commercial strategies and local economic development strategies must identify employment targets for activity centres, together with strategies to support employment creation, concentration, diversity and quality. A proponent of development within the activity centre must demonstrate how a proposed development within an activity centre will contribute to employment, to enhance both the employment self-sufficiency in the sub-region and the provision of high quality employment (eg knowledge intensive and export oriented jobs).

Diversity

This characteristic recognises the importance of achieving a diverse mix of activities within activity centres consistent with their function and position in the hierarchy.

Objectives

- Maximise multipurpose user trips.
- Maximise the positive externality benefits associated with the co-location of complementary activities.

Policy principle 10.11: diversity of activities

- Activity centre plans must plan for a diverse mix of activities in activity centres consistent with their function and position in the hierarchy. This diversity of activities should arise from as diverse a range of land use functions as possible (such as retail and commercial land use; institutional – relating to health and/or education; industry; recreation and residential land uses).
• Activity centre plans must demonstrate how a proposed development within an activity centre will contribute to achieving a diverse range of activities consistent with the centres function and position in the hierarchy.

• Activity centre plans must demonstrate how a proposed development in an activity centre development incorporates residential components in the activity centre or its area of influence.

• Activity centre plans must demonstrate how the development incorporates non-retail activities in close proximity to retail activities so as to maximise complementarities.

**Intensity of activities**

This characteristic recognises the economic and social benefits of complementary uses located in close proximity, and scale of such uses consistent with the centres function and position in the hierarchy.

**Objective**

• Maximise the intensity and scale of proximate complementary activities and infrastructure within the activity centre.

**Policy principle 10.12: intensity of activities**

• Activity centre plans must contain an intensity of activities consistent with the centres function and position in the hierarchy.

• Activity centre plans must contain a scale of development (bulk and height) that is complementary to the proximate activities within the centre.

• Activity centre plans should maximise the use of existing land and infrastructure within activity centres.

**Accessibility**

This characteristic recognises that accessibility is critical to the efficient operation and function of a centre within the hierarchy. Accessibility can mean user access to activity centres, user movement within activity centres, and user movement between activity centres.

**Objectives**

• Maximise the ability of target users to access activity centres, through the provision of a wide range of high quality transport options, including rail, bus, ferry, cycling and walking.

• Maximise the ease and safety of movement for users within the centre and its area of influence.

• Optimise the ability of users to move between activity centres with a choice of modes and standard of service consistent with the centre functions and level in the hierarchy.

**Policy principle 10.13: activity centre accessibility**

Activity centre plans must maximise user access to activity centres, user movement within activity centres, and user movement between activity centres. A proponent of development within an activity centre must demonstrate how the development will contribute to and support accessibility.
Spatial extent (spacing and size)

This characteristic recognises that activity centres must be appropriately spaced and sized in accordance with their function and position in the hierarchy to ensure equitable access by all users. This results in the need to manage a balance between the sizes of centres versus the size of the service catchments through the introduction of maximum thresholds under specific circumstances.

Objectives

- Minimise distance travelled to access neighbourhood centres consistent with Liveable Neighbourhoods.
- Minimise distance travelled to local activity centres consistent with their function and position in the hierarchy.
- Maximise multi-purpose trips at district, regional, strategic and primary centres.

Policy principle 10.14: spacing and size of activity centres

- The spacing of activity centres at the different levels of the hierarchy will be in accordance with State Planning Policy 4.2 or such interim policy statement as approved by the WAPC.
- The retail component size must be consistent with State Planning Policy 4.2 or such interim policy statement as approved by the WAPC.

10.2.3 Implementation of activity centres

Refer to figures 16(a), 16(b), 16(c) and 16(d)

(i) Activity centre plans

Activity centre plans (as envisaged in State Planning Policy 4.2 or such interim policy statement as approved by the WAPC) are to be prepared by the respective local governments for all categories of activity centres from primary centre to district centre inclusive, and submitted to the WAPC for endorsement.

Policy principle 10.15: activity centre plans

Activity centre plans must delimit the activity centre boundary and demonstrate how the plan responds to the policy objectives in section 10.2.2 of the structure plan and the performance criteria established in State Planning Policy 4.2 (or such interim policy statement as approved by the WAPC). Development within the activity centre shall be consistent with an approved centre plan.

Policy principle 10.16: activity centre design

The design of activity centres will be based on main street design principles, with buildings addressing and fronting onto adjacent streets. City and town centre activity centres are not intended to be designed as or function merely as shopping centres, but must provide for a mix of commercial, residential and community uses consistent with transit oriented design principles. The urban design framework of activity centres must be included as part of activity centre plans.
10.3 Activity corridors

Activity corridors are movement corridors servicing or connecting activity centres, and are principally concerned with establishing good access (including strong public transport), higher residential densities and increased housing choice, along the corridor.

Policy principle 10.17: activity corridors
The following must be investigated further for consideration as the regional activity corridors in the sub-region:

- City of Rockingham - Warnbro Sound Avenue, Baldvis Road, Eighty Road
- Town of Kwinana - Gilmore Avenue and Sulphur Road
- City of Mandurah - Lakes Road South, and Lakes Road East.
11. Land use and density considerations

11.1 The urban form

The structure plan seeks to ensure that an urban framework is provided that facilitates a much more sustainable urban and environmental outcome in all new developments. Within this framework it is essential that there is improved social sustainability (social capital and community development), improved levels of affordability (in housing and in general costs of living) and better equity and choice.

The Liveable Neighbourhoods approach to urban development calls for an urban form based on walkable, mixed-use towns and neighbourhoods, within which there is to be significantly greater emphasis on:

- Enhancing local identity through site responsive design, integrated network of streets (with a high degree of accessibility), wider housing choice and increased residential density.
- Designing integrated communities, with an appropriate level and distribution of mixed use centres, public transport, and adequate and appropriate provision for a range of employment opportunities.
- An increased emphasis on natural resource conservation and management.
- Greater consideration to the integration between new and existing urban development.
- An urban design which is supportive of pedestrian movement (walking) and cycling, and which encourages public transport use.

Policy principle 11.1: the urban form/framework

The urban form/framework must facilitate a more sustainable urban and environmental outcome, providing improved social sustainability, improved levels of (housing and living) affordability and better equity and choice.

11.2 Housing density and diversity

11.2.1 Housing density.

The Liveable Neighbourhoods policy requires housing densities of an average of at least 15 dwellings per urban hectare (and an average of 22 dwellings per site hectare), in the structure plan area. Lower densities may be appropriate in urban fringe areas or in physically constrained areas, while higher density opportunities will be present in higher order centres, along key activity corridors/arterials, and in proximity to railway stations.

Policy principle 11.2: planning for increased housing density

The residential densities within the structure plan area must be consistent with that articulated in the Liveable Neighbourhoods, Directions 2031 and local government policies, ie a minimum average of 22 dwellings per site hectare (being the net area of
land to be developed for residential purposes and excluding non-residential uses such as streets, laneways, open space and activity centres).

**Policy principle 11.3: higher residential densities in strategic locations**

Residential densities must be significantly higher in strategically located areas, such as in and close to activity centres, and railway and bus stations, and along key activity corridors such as high-frequency bus routes. For example, residential densities within activity centres with primary land use activity ranking should range between 80 and 120 dwellings per site hectare. Activity centres with secondary land use activity ranking should contain residential densities ranging between 50 to 80 dwellings per site hectare and residential densities in activity centres with local land use activity ranking should range between 30 to 50 dwellings per site hectare. (refer to table 9 for land use activity rankings)

11.2.2 Housing Diversity

In addition to increased housing density, future development also needs to give attention to increased housing diversity and the planning and development of an increased choice in housing to meet an increasingly diverse range of household sizes and configurations.

**Policy principle 11.4: planning for increased housing diversity**

The quality and diversity of housing provided must strive to meet the needs of the sub-regional population, in locations that provide equitable access and lifestyle opportunities, through best practice urban design, architecture, and building that creates and maintains diverse, more attractive, safer and more liveable urban environments.
12. Public utilities

12.1 Water supply

12.1.1 Current services

The sub-region is well serviced with appropriate levels of water supply. The major existing water infrastructure is shown in figure 17. The sub-region is currently supplied off the southern sources system which runs through the sub-region. The southern sources system integrates all water sources south of the Serpentine Dam into the integrated water supply system.

12.1.2 Capacity

There are no overall water capacity issues for the sub-region, although investigations are still underway to determine the possibility of the Karnup underground water source area becoming a part of the bulk water supply for the sub-region. This area is currently under detailed investigation by the DoW and the Water Corporation as to its future use as a scheme water. Should this not be viable, scheme water will be obtained from other sources, and the local groundwater can be used for secondary purposes. Since the local supply would be low, in the order of 5 to 7 Gl/annum, it would have to be augmented from elsewhere. Major headworks would need to accompany any such plans.

There are some areas where infrastructure improvements will be required in order to ensure adequate water supply for urban development. These include:

- The Baldwins corridor, where a pump station will be required near the Rivergums development to enable further development to occur.
- The Karnup area, where a new reservoir will be required to ensure adequate water pressure for urban development in the area.
- The south-east corridor, where the construction of additional major headworks such as tanks and large pipelines before 2020 to enable development on the eastern side of the corridor.

The key water infrastructure required to service the structure plan area is listed in table 11, which details all water, wastewater and drainage infrastructure required in the sub-region over the next 20 years. In order to facilitate the efficient and timely provision of infrastructure it is necessary to do so through orderly and integrated land and infrastructure planning. If development is not in a frontal and orderly sequence, capital funding will need to be increased – as larger upfront investments will be required.

12.1.3 Other planning considerations

Water mains have specific alignment and hydraulic characteristics, which must be accommodated in greenfield and urban situations alike. It is important that these strategic routes and key sites are mapped and protected in advance of development.
The state needs to facilitate strategic planning and implementation, particularly in an urban intensification project, through structure plans and other forms of planning assistance. Wherever feasible a common trench approach must be adopted in the interests of land use efficiency. There may be a need to do detailed infrastructure plans at points where services have little room.

12.1.4 Key Policy Principles

Policy principle 12.1: utilities: water supply

Once identified, all strategic service routes as well as sites for tanks and pumping must be protected in advance of development in order to provide certainty of water supply infrastructure.

Service fronts must, where possible, be adjacent to, and sequenced off, existing development.

Wherever feasible a common trench approach (for pipes and other infrastructure) must be adopted, in the interests of land use efficiency.

The design of residential areas and housing units must facilitate a reduction in water consumption, through (amongst others) the use of suitable fittings, rainwater tanks, appropriate landscaping and the re-use of wastewater.

Water management plans to address water conservation and efficiency, to minimise the importation of water supplies from outside the area, are to be drawn up.

12.2 Wastewater treatment

12.2.1 Current services

Current sewer services including treatment works, sewer mains and pumping stations are shown in figure 18.

12.2.2 Capacity

The existing wastewater treatment infrastructure is only sufficient to meet development requirements in the short term.

Development of the new East Rockingham wastewater treatment plant is crucial for medium to longer terms development of the Kwinana, Rockingham and Serpentine and Jarrahdale areas. This new facility is planned for completion by 2015, and the Water Corporation is currently seeking project approvals for the plant and a service corridor to accommodate the main sewer terminating at the site.

The Gordon Road wastewater treatment plant is nearing capacity and will be upgraded by 2009, with statutory protection of the buffer zone being a key requirement of this upgrading.
The Point Peron wastewater treatment plant has a license until 2010 and was due to be decommissioned at this time. This is now not possible and the plant will be required to remain operational until the East Rockingham wastewater treatment plant can be substituted. Permission from the EPA will be required to obtain a license for Point Peron to operate beyond 2010.

The Halls Head wastewater treatment plant is at capacity. If any urban intensification occurs in this area, a major upgrade may be required.

The Caddadup (Dawesville) wastewater treatment plant is nearing capacity.

The site identified at Tims Thicket for a future wastewater treatment site has constraints which need to be investigated.

Key wastewater treatment infrastructure planned is shown in table 11.

12.2.3 Other planning considerations

The Water Corporation requires that the planning for wastewater treatment be done well in advance. As with water supply, security of treatment plant sites including buffers is required in order to provide certainty of effective future wastewater treatment infrastructure provision.

The Water Corporation is currently reviewing its wastewater strategy for the greater Mandurah region, which will include an assessment of the Gordon Road, Halls Head and Caddadup plants. The future plant site at Tims Thicket and other potential sites will also be investigated to ensure that the region has a secure long term strategy to meet future servicing requirements.

According to the State Infrastructure Report Card 2005 only 3.4% of sewer effluent was reused or recycled in Perth during 2003–04, compared with an 48% average for other regional centres. The remainder of the sewer effluent in Perth is disposed to ocean outlets. In contrast, Perth reused or recycled 93% of its biosolids (riding to 99.9% in 2005-6), and the only other regional centres that reuse or recycled bio-solids were Bunbury (80%) and Albany (25%). The State Water Strategy adopted a target to establish 20% reuse of treated wastewater by 2012. The Water Corporation is currently planning re-use from its East Rockingham waste water treatment plant site to nearby industry and LandCorp is similarly planning for re-use at Latitude 32.

12.2.4 Key policy principles

Policy principle 12.2: wastewater treatment

The proponents of development must demonstrate compliance with the existing policy provisions pertaining to wastewater treatment and re-use, and in particular:

1. Strategic service routes as well as sites for treatment plants (including buffers) and pumping stations must be protected in advance of development.
2. Service fronts must, where possible, be adjacent to, and sequenced off, existing development.

3. Wherever feasible a common trench approach must be adopted in the interests of land use efficiency.

**Policy principle 12.3: wastewater treatment infrastructure: location**

The following principles are non-negotiable with respect to defining the ultimate location of pumping stations and surrounding land uses.

1. New pumping stations must be located to reduce their visual impact at major intersections and public spaces.

2. New pumping stations must be located appropriately to service their ultimate catchment (in consultation with the Water Corporation).

3. New pumping stations must be located away from the activity corridor and areas of higher density development.

4. Land identified for ultimate substation locations must be owned by the proponents of the district structure plan which first identifies their ultimate location or, if outside the area of the sub-regional structure plan, be suitable for servicing urban development to the satisfaction of the Water Corporation and relevant local authority and not impact on the amenity of the surrounding area.

5. The final location of pumping stations must be determined by negotiation with the relevant local authority and the Water Corporation, and will ultimately be determined during subsequent planning stages.

6. Pumping stations must be planned and provided with adequate buffers for odour, noise and public risk.
### Table 11: Water and wastewater projects – State infrastructure strategy

<table>
<thead>
<tr>
<th>Water and wastewater</th>
<th>Etc ($’000,000)</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Corporation</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Years 1 to 4: 2007 - 08 to 2010 - 11</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rockingham MPS Seabrooke Duplicate PM</td>
<td>7.4</td>
<td>2007</td>
<td>2008</td>
</tr>
<tr>
<td>East Rockingham WWTP: Land Purchase</td>
<td>58.8</td>
<td>2007</td>
<td>2009</td>
</tr>
<tr>
<td>Caddadup WWTP Upgrade</td>
<td>9.6</td>
<td>2007</td>
<td>2009</td>
</tr>
<tr>
<td>Halls Head WWTP - Upgrade to 5.8 ML/d</td>
<td>24.2</td>
<td>2007</td>
<td>2009</td>
</tr>
<tr>
<td>Mandurah Lakes Rd 1400S Link to HSTM -</td>
<td>27.6</td>
<td>2007</td>
<td>2009</td>
</tr>
<tr>
<td>Mandurah WWTP-Gordon Rd Amplification</td>
<td>42.2</td>
<td>2007</td>
<td>2010</td>
</tr>
<tr>
<td>Baldivis SPS Divert- Kwinana M&amp;E upgrade</td>
<td>11.8</td>
<td>2007</td>
<td>2010</td>
</tr>
<tr>
<td>Wungong 1400 Trunk Main</td>
<td>88.8</td>
<td>2007</td>
<td>2011</td>
</tr>
<tr>
<td>Southern Sources Integrate Assets Inves -</td>
<td>7.5</td>
<td>2007</td>
<td>2012</td>
</tr>
<tr>
<td>East Rockingham WWTP 40 ML/d</td>
<td>116.4</td>
<td>2007</td>
<td>2014</td>
</tr>
<tr>
<td>Tamworth Pump Station Upgrade</td>
<td>24.1</td>
<td>2008</td>
<td>2011</td>
</tr>
<tr>
<td>Ravenswood Transfer Pump Station -</td>
<td>58.3</td>
<td>2008</td>
<td>2011</td>
</tr>
<tr>
<td>Preston Beach WW Treatment and Disposal</td>
<td>15.1</td>
<td>2009</td>
<td>2015</td>
</tr>
<tr>
<td>Mandurah Duplicate Nth Mandurah Tk</td>
<td>21.0</td>
<td>2010</td>
<td>2013</td>
</tr>
<tr>
<td><strong>Years 5 to 10: 2011-12 to 2016-17</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amarillo North: Type 90 PS, PM and Main Se</td>
<td>7.8</td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>Mandurah 4467m of 1200S Old Coast Rd</td>
<td>14.5</td>
<td>2011</td>
<td>2013</td>
</tr>
<tr>
<td>Mandurah Fremantle Rd Pipe Upgrades</td>
<td>18.5</td>
<td>2011</td>
<td>2013</td>
</tr>
<tr>
<td>Tamworth Reservoir to Serpentine TM</td>
<td>63.6</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>South West Highway Booster Pump Station</td>
<td>26.7</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>Serpentine TM to SW Hwy DN1400 Link</td>
<td>29.1</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>Serpentine TM/Dandalup TM - Mundijong Rd</td>
<td>27.6</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>South West Highway DN1400 -</td>
<td>82.4</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>Mandurah Nth Mand Tank 1800KW PS</td>
<td>9.8</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>East Rockingham - Main Gravity Sewers</td>
<td>31.8</td>
<td>2011</td>
<td>2015</td>
</tr>
<tr>
<td>Baldivis South Main Sewer Section 2</td>
<td>9.5</td>
<td>2012</td>
<td>2013</td>
</tr>
<tr>
<td>Karnup 1400, Karnup Southern Outlet: Re</td>
<td>10.6</td>
<td>2012</td>
<td>2013</td>
</tr>
<tr>
<td>Murray DN1400 Ravenswd PS - Nth Dand PS</td>
<td>57.9</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>Kwinana Water Reclamation Plant: Stage 2</td>
<td>16.4</td>
<td>2012</td>
<td>2014</td>
</tr>
<tr>
<td>Nth Dandalup: 5th Dand TM Duplication</td>
<td>69.4</td>
<td>2012</td>
<td>2015</td>
</tr>
<tr>
<td>Tamworth Reservoir No. 2</td>
<td>82.0</td>
<td>2012</td>
<td>2015</td>
</tr>
<tr>
<td>East Rockingham WWTP Effluent PS-Stage 1</td>
<td>9.7</td>
<td>2012</td>
<td>2016</td>
</tr>
<tr>
<td>Cape Peron Line Duplication (SV9 - Cape)</td>
<td>31.1</td>
<td>2012</td>
<td>2016</td>
</tr>
<tr>
<td>Serpentine Dam: Stage 2 Remedial Works</td>
<td>31.6</td>
<td>2012</td>
<td>2016</td>
</tr>
<tr>
<td>Baldivis South Main Sewer Section 1</td>
<td>20.0</td>
<td>2013</td>
<td>2015</td>
</tr>
<tr>
<td>Mandurah duplicate Caddadup 25ML Tk</td>
<td>19.6</td>
<td>2013</td>
<td>2016</td>
</tr>
<tr>
<td>Mandurah Pinjarra Headworks Stage 1</td>
<td>12.8</td>
<td>2013</td>
<td>2017</td>
</tr>
<tr>
<td>Wungong Dam Remedial Works - Spillway</td>
<td>18.6</td>
<td>2014</td>
<td>2017</td>
</tr>
<tr>
<td>Serpentine TM Triplcation Mundijong - Arm</td>
<td>64.8</td>
<td>2014</td>
<td>2018</td>
</tr>
<tr>
<td>Warnbro: Safety Bay Rd PS PM Diversion</td>
<td>17.1</td>
<td>2014</td>
<td>2019</td>
</tr>
<tr>
<td>Mandurah Gordon Rd WWTP 18 ML/d</td>
<td>31.6</td>
<td>2014</td>
<td>2019</td>
</tr>
<tr>
<td>Preston Beach WS: Source Augmentation</td>
<td>27.2</td>
<td>2016</td>
<td>2019</td>
</tr>
<tr>
<td>Caddadup WWTP Upgrade to 6 ML/D</td>
<td>28.9</td>
<td>2016</td>
<td>2022</td>
</tr>
</tbody>
</table>

Table 11 continued on next page
# 12.3 Energy (electricity and gas)

## 12.3.1 Electricity

(i) Existing services

Existing electricity supply infrastructure in the sub-region is shown in figure 19

(ii) Capacity

The southern sectors region is well serviced with relatively few issues for power supply. Western Power forecast demand for power out to 25 years and this has resulted in appropriate planning for the required substations in the southern sectors, with additional substations and transformers planned to satisfy forecast demand.

Upgrading of existing at capacity substations in urban or central business district areas requires the use of bigger transformers which require:

- more space;
- more switchgear;
- different technology; and
- are more expensive.

The cost of substations is in the order of $25 to $30 million for a central business district type substation and $17-$18 million for a standard substation. It is often more efficient to build an additional standard substation on another site in order to avoid issues with transformer upgrades such as cable congestion. Planning and building a new substation takes approximately three years and their location generally supports development adjacent to existing development to avoid “leapfrogging.”
In terms of shared services corridors, power cables can co-locate with roads and rail and some sewerage but there are earthing issues. Power cables cannot be co-located with a steel pipeline, Telstra cables or gas pipelines.

New electricity supply infrastructure planned for the sub-region and included in the State Infrastructure Strategy, is shown in table 10.

(iii) Other planning considerations

Substations require a site approximately 100m by 100m (1 hectare total). A site of this size enables expansion to up to three transformers which could supply power to 40,000 to 50,000 dwellings. The main issues for planning of sites include securing the land, congestion of cable and securing the cable routes. Land needs to be identified for substations at 10, 20 and 30 year intervals. Western Power has experienced difficulties in securing sites in a timely manner.

According to Western Power, density can give savings over sprawl due to economies of scale regarding reticulation costs.

(iv) Key policy principles

**Policy principle 12.4: electricity**

*The proponents of development must demonstrate compliance with the existing policy provisions pertaining to electricity, and in particular:*

1. Strategic service routes as well as sites for substations, once identified, must be protected in advance of development.
2. Service fronts must be adjacent to, and sequenced off, existing development.
3. Wherever feasible a common trench approach should be adopted in the interests of land use efficiency.

**Policy principle 12.5: electricity supply and transmission: substation location**

*The following principles are non-negotiable with respect to electricity substation location and surrounding land use.*

1. New substations must be located to reduce their visual impact at major intersections and public spaces.
2. New substations must be located central to their ultimate catchment (in consultation with Western Power).
3. New substations must be located adjacent to or as close as reasonably practical to existing transmission lines located within the load area. These locations must also be accessible for future transmission lines, if required.
4. New substations must be located away from activity corridors and areas of higher density development.
5. Land identified for ultimate substation locations must be owned by Western Power.
6. Final location of substations, transmission lines and any related infrastructure must be determined by negotiation with the relevant local authority and Western Power.
12.3.2 Gas

(i) Existing services

Existing gas supply infrastructure in the sub-region is shown in figure 20.

(ii) Capacity

The general capacity of gas supply to the sector is sufficient for anticipated demand. However, access to it depends on proximity to existing services. The gas market is deregulated and the agency operates on commercial terms. Its practice is to reticulate to new developments adjacent to existing development at little or no cost to the developer. However, development distant from existing services is not serviced unless the developer pays for extension of gas mains to the location. In most cases this has not proved economical and some new developments are undertaken with no gas supply. Hot water heating makes up a substantial proportion (around 60%) of gas use of a typical gas serviced household. The increasing use of solar hot water systems decreases gas demand and reduces the viability of gas extension to remote unserviced areas. Therefore, in general, only developments adjacent to existing gas supply will be gas serviced.

Future gas supply infrastructure for the sub-region, included in the State Infrastructure Strategy, is shown in table 12.

(iii) Key policy principles

Policy principle 12.6: gas

The proponents of development must demonstrate compliance with the existing policy provisions pertaining to gas, and in particular:

1. Strategic service routes as well as sites for substations, once identified, must be protected in advance of development.

2. Service fronts must, where possible, be adjacent to, and sequenced off, existing development.

3. Wherever feasible a common trench approach should be adopted in the interests of land use efficiency.
### Table 12: Energy (electricity and gas) projects – State infrastructure strategy

<table>
<thead>
<tr>
<th>Energy (electricity and gas)</th>
<th>Etc ($'000,000)</th>
<th>Start</th>
<th>Finish</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verve</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Years 1 to 4: 2007 - 08 to 2010 - 11</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kwinana PS</td>
<td>14.1</td>
<td>2007</td>
<td>2015</td>
</tr>
<tr>
<td>Cockburn PS</td>
<td>84.0</td>
<td>2007</td>
<td>2027</td>
</tr>
<tr>
<td><strong>Western Power (Networks)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Years 1 to 4: 2007 - 08 to 2010 - 11</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kwinana: Install 330/132KV Transformer</td>
<td>20.0</td>
<td>2009</td>
<td>2011</td>
</tr>
<tr>
<td>Kwinana to Southern Terminal 81: Convert Line to Double Circuit</td>
<td>5.4</td>
<td>2009</td>
<td>2012</td>
</tr>
<tr>
<td>Landwehr Terminal: Cut In Shotts To Southern Terminal/ALCOA Pinjarra 91 Line</td>
<td>19.2</td>
<td>2010</td>
<td>2013</td>
</tr>
<tr>
<td>Pinjarra To Mandurah 81 Line Uprate</td>
<td>5.0</td>
<td>2009</td>
<td>2011</td>
</tr>
<tr>
<td>Establish Baldivis Substation</td>
<td>9.5</td>
<td>2010</td>
<td>2014</td>
</tr>
<tr>
<td>Mason Road Substation: Fault Level Uprate</td>
<td>5.9</td>
<td>2010</td>
<td>2014</td>
</tr>
<tr>
<td><strong>Years 5 to 10: 2011 - 12 to 2016 - 17</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hopeland: Establish 330KV Terminal</td>
<td>26.5</td>
<td>2011</td>
<td>2014</td>
</tr>
<tr>
<td>Port Kennedy: Establish New Substation</td>
<td>13.8</td>
<td>2014</td>
<td>2018</td>
</tr>
<tr>
<td>Golden Bay: Establish New Substation</td>
<td>14.1</td>
<td>2015</td>
<td>2019</td>
</tr>
<tr>
<td>Baldivis: Install 2nd Transformer</td>
<td>5.2</td>
<td>2015</td>
<td>2018</td>
</tr>
<tr>
<td>Naval Base/Mason Road: Establish 330KV Terminal</td>
<td>52.2</td>
<td>2016</td>
<td>2021</td>
</tr>
<tr>
<td><strong>Years 11 – 20: 2017 - 18 to 2026 - 27</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New South West Transmission Line</td>
<td>276.7</td>
<td>2017</td>
<td>2023</td>
</tr>
<tr>
<td>New South West Transmission Line</td>
<td>391.4</td>
<td>2021</td>
<td>2026</td>
</tr>
<tr>
<td>Kwinana: Install 2nd 330/132KV Transformer</td>
<td>29.3</td>
<td>2021</td>
<td>2025</td>
</tr>
<tr>
<td>Mason Road: Install 3rd Transformer</td>
<td>5.5</td>
<td>2017</td>
<td>2020</td>
</tr>
<tr>
<td>Ravenswood: Establish New Substation</td>
<td>15.0</td>
<td>2018</td>
<td>2022</td>
</tr>
<tr>
<td>CFN: Install 2nd Transformer and 10mvar Capacitor Banks</td>
<td>8.9</td>
<td>2018</td>
<td>2021</td>
</tr>
<tr>
<td>East Rockingham: Establish Substation</td>
<td>15.4</td>
<td>2019</td>
<td>2023</td>
</tr>
<tr>
<td>Ravenswood: Install 2nd Transformer and Capacitor Banks</td>
<td>9.3</td>
<td>2019</td>
<td>2023</td>
</tr>
<tr>
<td>Baldivis: Install 3rd Transformer</td>
<td>5.8</td>
<td>2019</td>
<td>2022</td>
</tr>
<tr>
<td>Port Kennedy: Install 2nd Transformer and Capacitor Bank</td>
<td>9.4</td>
<td>2020</td>
<td>2024</td>
</tr>
<tr>
<td>Golden Bay: Install 2nd Transformer and Capacitor Bank</td>
<td>9.6</td>
<td>2021</td>
<td>2024</td>
</tr>
<tr>
<td>Clifton: Install 3rd Transformer and 10mvar Capacitor Banks</td>
<td>9.6</td>
<td>2021</td>
<td>2024</td>
</tr>
<tr>
<td>Waikiki - 3rd Transformer</td>
<td>6.1</td>
<td>2023</td>
<td>2025</td>
</tr>
</tbody>
</table>
Figure 17: Existing water infrastructure
Figure 18: Existing wastewater treatment infrastructure
Figure 19: Existing electricity infrastructure
Figure 20: Existing natural gas distribution network
13. Social and cultural

13.1 Educational facilities

Educational facilities are an essential part of a community and it is critical that their location, size and number are carefully considered in an urban design context as well as a broader social and economic context.

While there is a correlation between the number of residential lots, population and the simple number of educational facilities to be provided within the sub-region, it is more critical to consider the demographic profile of the community they are to serve. In addition it is critical to gain an understanding of the conditions/circumstances in existing established schools; the educational training requirements of local business, industry or particular comparative advantage, and the role that educational facilities can play in increasing employment self-sufficiency and employment self-containment.

The co-location of educational facilities with other institutional and compatible uses such as passive and active open space, library facilities, sports facilities and other community uses can provide lasting benefits. With careful planning of educational facilities opportunities exist through co-operative planning, design and management to more effectively plan joint provision of facilities particularly for extended community use. This provides the benefit of a more integrated educational system and ensures that wherever possible duplication is avoided and utilisation is maximised.

Policy principle 13.1: planning, identification and provision of school sites

Schools are important elements in the design of urban areas and must be planned and identified in district and local structure plans in consultation with the Department of Education and Training and with reference to the Liveable Neighbourhoods Policy. The co-location of community facilities with school sites should wherever possible be explored and opportunities identified. Primary schools must be located centrally within their residential catchment, secondary schools must be located in proximity to major transport facilities and routes, and interimschools must be considered for location in activity centres.

Policy principle 13.2: location of universities and TAFE’s

Universities and TAFE’s must be located as integral parts of mixed use activity centres.
**Policy principle 13.3: promote the wider use of educational facilities for community use**

Opportunities for the joint provision and dual use of facilities in appropriate locations within or adjacent to educational sites should be considered. Provision is to be determined by an assessment of need and opportunity based on current and future estimated demographics and should determine the ability of an education facility to service a local community with regard to:

- art
- health
- libraries
- sport and recreation
- lifelong learning

### 13.2 Sport, recreation and open space

Sport and recreation facilities, and informal and formal open space contribute significantly to the quality of life. The social and economic role such facilities play in everyday life is often underestimated as they contribute to the legibility, identity and sense of place that helps to build a community. Studies undertaken have demonstrated that access to good community sport and recreation provision is a catalyst for building social capital, improving peoples health and wellbeing, enhancing educational attainment and acting as a diversionary activity from crime and anti-social behaviour.

In addition the provision of sufficient, well-planned and designed public open space, outdoor sports and recreation facilities within the urban growth corridor can help reduce vehicle congestion and associated resultant air pollution by encouraging greener travel modes. Trail and pathway systems located within well-planned urban green spaces can help to save energy and protect air quality by encouraging more environmentally sustainable non-motorised transport modes, such as walking and cycling. Communities will also be encouraged to travel less and discouraged from travelling further distances by the private car if there is already publicly accessible recreational open space adjacent to where they live, shop and work.

Public open space in the urban growth corridor is intended to respond to a number of different requirements including:

- conservation ie bushland, creek systems and other wetlands;
- flood protection and drainage as directed by the drainage and water management plan;
- passive and active public open space requirements (that may be associated with the proposed schools as agreed with the Department for Education and Training);
- providing for climate change mitigation by assisting in reducing extremes in temperature and moderating humidity;
- a source of clean air within the metropolitan area and heavily urbanised environments.
It is not appropriate to designate all sport, recreation and local open space within the sub-regional structure plan as this will be resolved at the local structure planning phase. It is however important to highlight the significant recreation sites of a regional or sub-regional significance (Lark Hill and Fiegerts Road) which have been implemented or identified through current strategic planning processes. The local structure planning process is expected to pay regard to four key principles in determining local provision:

- The protection of existing sites from development or suitable replacement.
- The potential to improve and upgrade existing sites to meet emerging community requirements.
- The provision of new open space or facilities either within new urban areas or on other land
- The provision of accessible open space within close proximity to all residents.

It is also essential to establish the principles which will guide a more strategic and analytical approach to the location and development of accessible community infrastructure. The analysis will expect to address issues relating to managed access to environmentally sensitive areas and the potential use and availability of groundwater resources (or alternative resources) to support active recreation. It is advocated that such analysis should be undertaken as early as possible within the planning process.

It is recognised that presently, there are few studies that would provide a robust evidence base and platform from which sport and recreation facilities and open space access standards can be derived. In the absence of such work, community provision should be provided in accordance with the standards identified in Liveable Neighbourhoods. Liveable Neighbourhoods will be supplemented by work currently being undertaken by the Department of Sport and Recreation in establishing baseline information (through the active places project and an open space analysis) to support a more responsive localised assessment. Once undertaken and adopted, the work will inform the needs analysis and provide the robust evidence on which local standards will be determined.

**Policy principle 13.4: assessment of need and opportunities for the provision of sport, recreation and open space**

A detailed assessment of community facility need and opportunity is required to be undertaken as part of all structure planning processes. The level of sport, recreation and open space provision is to be determined locally in consultation with relevant local governments, and be responsive to existing strategic plans, current and anticipated demographics.

**Policy principle 13.5: the provision of accessible community infrastructure**

All community infrastructure (sports facilities, parks, open space and recreational play space) should be accessible, integrated, well designed and connected in providing for a broad range of community services in accordance with acceptable minimum design specifications. Structure plans will be required to identify the phasing of sport, recreation and community infrastructure based on population growth, demographics.
and potential usage profile. In addition they will be required to demonstrate that developer contributions to local governments are sufficient to construct, maintain and manage the facilities in accordance with existing policy and practices.

Policy principle 13.6: the provision of community sport, recreation and open space within environmentally sensitive areas

Sport and recreation opportunities will be promoted within and adjacent to environmentally sensitive areas where the uses are compatible with long term environmental objectives. Management solutions should be sought to resolve potential conflicts of activity and where it is demonstrated that a management solution is not viable, alternative locations should be identified and provided to accommodate those sport and recreation activities for which a demand has been proven.

Policy principle 13.7: the provision of sport, recreation and open space on land capable of servicing the identified community need

Where sport and recreation facilities are identified in a structure plan it must be accompanied by a detailed assessment of the capability of the land to accommodate acceptable standards of provision; that are capable of being accessed by the community it is proposed to serve and provide flexibility to accommodate changing trends in participation.

13.3 Aboriginal and European heritage

Various sites throughout the sub-regional structure plan area are identified as having heritage value, either by the Department for Indigenous Affairs, Heritage Council of Western Australia or by the local governments.

Known indigenous sites are to be retained and protected in areas of open space or other appropriate areas as approved by the WAPC and the local governments. Full consultation of the Aboriginal community will be required at the time of district and local structure planning. Suitably qualified consultants will be required to conduct ethnographic and archaeological surveys of the development area in accordance with the provisions of the Aboriginal Heritage Act 1972. Assessment of sites of European heritage is to similarly occur at this time to determine the appropriateness of conservation, adaptation or demolition.

Policy principle 13.8: heritage protection

The process of preparation of district and local structure plans must include consultation with the relevant government bodies responsible for heritage protection. Areas needing protection must be identified on each plan as required by the relevant government body. Where heritage sites are identified to be located in areas of public open space, this will be to the satisfaction of DPI, Department of Indigenous Affairs, the Heritage Council of Western Australia and the relevant local government. Appropriate management and maintenance plans for the heritage sites must be prepared at the applicants cost for implementation as determined by the DPI, Department of Indigenous Affairs, Heritage Council of Western Australia and local government.
14. Implementation

14.1 Background

This structure plan has been prepared by the DPI in collaboration with key state government agencies, including the service providers and the five local governments, and various industry related entities. The identification of land and infrastructure locations is underpinned by an urban growth management strategy that identifies the specific areas within the broader study area boundary where the planning, investment in and development of land and infrastructure are either encouraged or discouraged. These planning instruments are prepared and implemented within the broader context of a Perth metropolitan and Peel regional strategy, namely Directions 2031, which together with the urban growth management strategy and the sub-regional structure plan represents the strategic planning framework informing decisions on the planning and development of Perth and Peel. Notwithstanding, the successful implementation of this suite of strategic planning instruments depends on the state government's collective leadership underpinned by an understanding of the competing and complementary planning and development issues, together with the committed involvement of the land development industry, landowners and the wider public.

Past sub-regional structure plans have tended to show where land and infrastructure could be developed with general reference to specific priorities and timeframes. This has been followed by a more detailed planning process by local government, landowners and developers investigating and planning the land in conjunction with the services agencies, in the context of broader strategic considerations. Past sub-regional structure plans have been focussed on delivering a land supply to meet the projected demand. While seeking to meet the projected demand, the approach of this structure plan is to emphasise a planning and development process that addresses the broader aspects of sustainability such as: encouraging accessible and connected urban centres; reducing reliance on private vehicle trips; ensuring infill and the building up of existing centres; using existing infrastructure; ensuring frontal development rather than sprawl; encouraging development that supports local employment creation; applying sustainable design practices; and providing opportunities for diverse and affordable housing while emphasising affordable living rather than simply affordable housing. The formulation of this structure plan has followed a two stage process.

The first stage involved the identification of the land areas capable of delivering a sustainable land supply to meet the projected demand through the preparation of an urban growth management strategy. During the recent past, the southern metropolitan and Peel regions experienced significant urban growth and consequent demand for land and infrastructure. Notwithstanding the fact that the sub-region contains large areas of undeveloped land, much of this area is highly constrained and the WAPC recognised the need to minimise any unrealistic expectations of urbanisation and the consequent negative impacts of any unrealised speculative practices.
Consequently the WAPC initiated the preparation of the urban growth management strategy to provide certainty and clarity to the sub-regions stakeholders via a thorough assessment of the capability and suitability of undeveloped land. This assessment has specifically identified land areas where the planning and development of urban land and infrastructure to meet the demand within the 25 year planning horizon should be either encouraged – in the case of relatively unconstrained land or conversely – discouraged where severe constraints to development exist. In keeping with Directions 2031, this assessment process was based on the following key assumptions: encourage a more compact city; work with the city we have and plan equitably for future communities; make more efficient use of land and infrastructure; and prioritise the planning and development of land that is already zoned for urban purposes under the MRS and PRS.

The second stage has involved the preparation of a sub-regional structure plan for the areas identified in the urban growth management strategy, particularly for those policy areas identified for more immediate urban development and/or protection.

The Southern Metropolitan Sub-Regional Structure Plan, originated from a WAPC resolution in early 2006 to review the strategic planning framework for the southern metropolitan and Peel region. A series of large state and local government workshops were held, with the first being in February 2006, where the major development issues facing the sub-region were identified and the need for alternative development scenarios for the sub-region was agreed. A second state and local government workshop in May 2006 investigated seven alternative scenarios. The workshop identified several gaps including the need to map constraints to development in the sub-region, particularly in respect of water and environmental conditions.

In this regard there was a need to undertake the following:

- prepare drainage and water management plans;
- investigate constraints to transit oriented development in specific locations on the southern rail line;
- identify longer term governance related requirements;
- provide strategic insights to future options for land development within the south-west, south-east and Peel corridors, and
- investigate major urban development proposals, including the proposed Keralup urban development and the expansion of existing Mandurah city centres, and future directions and urban form of the Pinjarra townsite.

The outputs from these workshops initiatives informed the direction and substance of a significant body of additional investigation. A third state and local government workshop was held in March 2007, where three development scenarios were presented and refined, namely: Perth and Peel coastal consolidation; balanced coastal and inland expansion; and a compact metropolitan consolidation scenario.

In addition to the scenarios a number of additional development issues were considered: the longer term development of the Mandurah/Pinjarra corridor; the identification of constrained areas that require more detailed review prior to proceeding
with the development of a structure plan; the identification of key focus areas requiring
detailed investigation and focussed planning attention – namely the location of the
Mandoglaup station and the Mandurah/Pinjarra corridor (and associated development
issues); and the future protection and conditional development of the areas within the
palusplain.

In the period following the March 2007 workshop to January 2008, a number of
technical studies were undertaken to more accurately define areas suitable and capable
for urban development, including:

- land use and infrastructure investigation of the palusplain (including determination
  of appropriate land uses);
- traffic modelling and assessment of different development scenarios;
- economic assessment and employment modelling;
- urban land capability assessment and urban land study for the south-west corridor
  area; and
- rural-residential land development and consolidation.

This was followed by an 18 month period of research, analysis and reporting to
government on the sub-regions land capability, including extensive liaison and
investigation with local government planning and engineering staff and the service
providers to inform the feasibility analysis of the land and infrastructure staging
strategy, the finalisation of the urban growth management strategy, the preparation
of the regional strategy: Directions 2031, and the alignment of the various planning
instruments.

14.2 Implementation components

The fundamental components for the implementation of the sub-regional structure plan
are in place and include the following:

(i) **Directions 2031**: is a regional strategy (ie the Perth metropolitan and Peel region)
    that interprets the overarching planning instrument, namely the State Planning
    Strategy, and provides a basis for cooperative action to be taken by the state and
    local government on land use and development. Directions 2031 provides high
    level strategic direction on the location, nature, size and relative priority of specific
    planning and development related initiatives across the Perth metropolitan and
    Peel region. This regional strategy provides certainty in a number of critical areas,
    including confirming the preferred growth scenario as the connected city with an
    emphasis on limiting urban development, identifying where development should
    be focussed and what patterns of land use and transport will best support this
development pattern; identifying the role, function and hierarchy of activity centres;
and describes six sub-regional planning areas. Three of these sub-regions, namely
south-west, south-east and Peel (which is termed a sub-region in this context due
to its comparative size), are addressed within this Southern Metropolitan and Peel
Sub-Regional Structure Plan.
(ii) **Sub-regional structure plan policy principles:** this sub-regional structure plan has been structured to guide the preparation of the more detailed district and local structure plans that are prepared by the local government in consultation with the service providers and the stakeholders (landowners, land and infrastructure developers). This guidance is provided via a series of policy principles that are statements outlining the requirements and responsibilities on key aspects of the more detailed strategic and statutory planning process. These policy principles will be subject to continuous review and revision by the WAPC.

(iii) **Urban growth management strategy:** the WAPC manages urban growth and development through the application of its strategic and statutory planning processes and instruments, and has expressed the following intentions:

- seek to give certainty and clarity to all stakeholders on the timing and phasing of urban growth and on the optimal spatial location of urban development – so as to minimise any unrealistic expectations of urbanisation and the consequent negative impacts of unrealised speculative practices;
- seek to minimise the loss of farmland, to maintain agricultural production and related jobs;
- ensure that it creates communities, brings local employment, delivers affordable housing, reduces travel demand, supports public transport, minimises impacts on rivers, lakes and estuaries, and protects biodiversity;
- use planning policy and instruments to prevent sprawl and avoid loss of precious environmental assets;
- plan new urban development with the community to ensure that development meets higher standards of design and environmental performance.

In seeking to provide clear policy guidance the WAPC has overseen the preparation of the urban growth management strategy, which is included within this structure plan. The strategy has identified specific land areas where state and local government investment in infrastructure is to be focussed, and where the rezoning, release and development of land for urban or other purposes is to be either encouraged or discouraged.

(iv) **Interim staging strategy:** the implementation of the structure plan requires key decision-makers to identify and manage the future supply of urban land and supporting infrastructure to meet the projected demand. A key element of the preparation process of this sub-regional structure plan has included the identification of land areas, identified as precincts with potential for future urban development. Each of these precincts have been investigated in detail with the key stakeholders, namely: local government planners and engineers; service providers staff; and staff of the key state government agencies such as the DoW, DEC, Main Roads WA, Department of Agriculture and Food and PTA. This information has included collection and collation of detailed information on the land capability, ownership, existing land use and zoning, area, physical characteristics and constraints, intentions and aspirations of the landowners, and supporting infrastructure requirements. This staging strategy has played an integral part in the preparation of this sub-regional structure planning particularly in the development of an interim staging strategy in close cooperation with the local governments and the services agencies. This entailed identifying all land potentially suitable for
development, assessing its infrastructure requirements and identifying existing or required capital programs in the services agencies, quantifying the potential yield of the land areas, and establishing the most likely timing and staging of the land. This interim staging strategy will inform the further determination of development opportunities and priorities in the course of implementing this sub-regional structure plan.

14.3 Development of additional implementation mechanisms, support strategies and technical investigations

In actioning the implementation of this structure plan, a number of additional implementation mechanisms, strategies and technical investigations will be pursued. These include:

(i) Land accumulation strategies: this refers to the need to work proactively with landowners and the development industry to facilitate the accumulation of land for future urban development within the structure plan area, particularly where ownership is fragmented.

(ii) Redevelopment strategies: the cities of Rockingham and Mandurah have identified the possibilities in redeveloping older parts of the existing urban environment, particularly where the urban areas have matured and where change is clearly required. The DPI will work closely with the local governments to explore suitable mechanisms to support this critical aspect of future development.

(iii) Section 16 advice in terms of the Environmental Protection Act: the DPI has already reached agreement with the DEC, that the DEC will provide section 16 advice on the structure plan proposals. This will take place early in implementation of the structure plan, and will serve to give greater clarity to local governments, landowners and developers regarding the environmental issues requiring attention as part of the planning and approval processes. This will also serve to significantly shorten the approval process time.

(iv) Drainage and water management strategies: in terms of the State Planning Policy 2.9 and the Better Urban Water Management policy, the DoW has commenced with a program to prepare drainage and water management plans both within and adjacent to the structure plan area. These will be crucial in informing development in the structure plan area and in areas identified as having possible future potential for longer term development.

(v) Palusplain natural resource management study: although the palusplain does not fall within the structure plan area in the strictest sense, it is nonetheless a very strategic asset in the context of the wider metropolitan region and its future development needs to be carefully considered. Resources have been secured for the preparation of a natural resource management plan for the palusplain, and this process will be advanced by the DPI in the early stages of implementation of the structure plan.

(vi) Regional traffic and transport modelling: in recognition of the need for strategic regional traffic modelling, the DPI has commenced with a strategic transport evaluation modelling initiative for the southern metropolitan sub-region. This will
be developed in the early stages of implementation of the structure plan and will be used to inform review and revision of the plan where necessary.

(vii) Contributions plan: a comprehensive development contributions plan/s is to be prepared in order to ensure the adequate provision of services (community facilities and key infrastructure) to cater for the expected population growth within the region. A final comprehensive developer plan will be implemented prior to the wider development of the corridor. The local governments will lead preparation of development contribution plan/s for the various district and local structure plan areas.

Note: the provision of utilities shall be the subject of separate agreements with individual utility providers.

(viii) District and local structure plans: are an essential element in the development process of the southern metropolitan and Peel regions. The sub-regional structure plan allows for a coordinated approach across the various local governments pertaining to regional planning issues, which the district and local structure plans should adopt where necessary. The DPI will work closely with the local governments.

(ix) Activity centre plans: the successful development and implementation of the envisaged activity centre plans will be critical in achieving the core objectives of the structure plan. The DPI will need to work closely with the local governments and other stakeholders in ensuring the successful development and implementation of these plans.

14.4 Managing a continuous process of structure plan implementation

As the financial, environmental, social and political forces that shape urban growth and the urban form become more complex, there is a growing realisation that a cooperative and proactive approach to managing and supporting growth is necessary across a wide range of stakeholders.

The sub-regional structure plan (incorporating the urban growth management strategy) has been structured as a “living” document, in the sense that it will be proactively managed, monitored, reviewed and revised, on an ongoing or continuous basis.

The DPI will lead this approach by managing the sub-regional structure plan implementation process in close collaboration with the local government, state government agencies and service providers. This process will include an alignment of the construction and development programs and budgets by the state and local governments for the various works through a structured program of monitoring, evaluation and reporting to the WAPC, to inform and guide the continuous review of the structure plan for adoption by the WAPC.

This structure plan review process will be linked to the DPI urban development program as an inclusive process, aimed at reporting on the implementation of a common vision, with clear development priorities and an associated planning and budgeting framework.
Appendix A:

Urban Growth Management Strategy: WAPC strategic policy to be issued in terms of State Planning Policy 1: State Planning Framework Policy (Variation 2) as a B4 strategic policy

Foreword

Over 50 years of regional planning and the operation of the Metropolitan Region Scheme and, more recently, the Peel Region Scheme, has enabled the State’s governments to manage the urban growth of the Perth metropolitan region in the long-term public interest.

The West Australian Planning Commission (WAPC) will continue to manage urban growth and development across the metropolitan and Peel regions, through the application of its strategic and statutory planning processes and instruments, and will:

- seek to give certainty and clarity to all stakeholders on the timing and phasing of urban growth and on the optimal spatial location of urban development – so as to minimise any unrealistic expectations of urbanisation and the consequent negative impacts of unrealised speculative practices;
- seek to minimise the loss of farmland, to maintain agricultural production and related jobs;
- ensure that it creates communities, brings local employment, delivers affordable housing, reduces travel demand, supports public transport, minimises impact on rivers, lakes and estuaries, and protects biodiversity;
- use planning policy and instruments to prevent sprawl and avoid loss of precious environmental assets;
- plan new urban development with the community to ensure that development meets higher standards of design and environmental performance.

Therefore the WAPC now seeks to provide clear policy guidance by identifying specific land areas where state and local government investment in infrastructure is to be focussed, and where the rezoning, release and development of land for urban or other purposes is to be either encouraged or discouraged.
1. **Policy rationale**

1.1. This statement is to be defined as a strategic policy in State Planning Policy 1.

1.2. There are significant pressures on land, infrastructure and water resources in the southern metropolitan and Peel region due to growth in population and demand for urban development.

1.3. The stakeholders involved in land and infrastructure planning and development require a clear policy framework for land use planning and development to guide decisions.

1.4. The Directions 2031 strategic framework has been prepared in close collaboration with government stakeholders and provides the context in which this urban growth management strategy is formulated.

1.5. The wider Perth and Peel community has provided strong support for the management of urban growth, which is reinforced in Directions 2031. This includes a requirement to curb urban sprawl and to enhance opportunities for urban infill and renewal within the existing urban area.

1.6. The designation of specific areas where planning and development is to be either encouraged or discouraged provides a clear guidance for state, local government and private investment in the development of land and infrastructure.

2. **Purpose and application**

2.1. This strategy identifies specific land areas designated as ‘urban growth management policy areas’ where the investment in land and infrastructure development is to be focussed, and other locations where land is to be protected and retained for non-urban purposes.

2.2. The application of this strategy aims to encourage sound and comprehensive planning that manages growth effectively and efficiently, to achieve the sustainable location, use and development of land and infrastructure.

2.3. This strategy will guide the identification of areas for the development of liveable communities ranging from urban consolidation, infill development and regeneration of existing urban areas to the master planning and development of new urban communities.

2.4. The identified policy areas will be addressed via the structure planning process and be designated in the region schemes and applied in conjunction with planning policies, strategies and guidelines relating to the planning, implementation and management of land, the environment, water, the economy, employment, basic raw materials and community building aspects, including all related state planning policies.

2.5. These designated policy areas are to be implemented via sub-regional structure plans and the results are to be monitored by the urban development program and reported to the WAPC. The WAPC will take these results and other factors into account during future amendments to this strategy.
Three urban growth management policy areas are designated as follows:

**Area 1: Areas under immediate consideration for development and protection.** The focus of attention in area 1 is on managing integrated land use and infrastructure development that meets the core objectives of the Directions 2031 regional strategy policy, including:

- intensification of urban development;
- industrial development;
- agricultural production, particularly horticulture;
- environmental protection and management of appropriate assets;
- reservations for public utilities and related use.

**Area 2: Areas for further investigation.** The focus of attention in area 2 is on investigating the suitability and capability of the land for longer-term development including areas under consideration for the following:

- future urban development, incorporating residential, retail and commercial, industrial, community facilities, public utilities and infrastructure, sport and recreation;
- existing and future biodiversity conservation, ecosystem services; and ecological restoration;
- existing and future agricultural production; and
- for subsequent designation as either area 1 or area 3.

**Area 3: Areas not under consideration for urban development.** The focus of attention in area 3 is on growth and development of rural and related activities, including:

- agricultural production;
- strategic infrastructure;
- resource use;
- biodiversity conservation;
- ecosystem services; and
- ecological restoration.
Appendix B: Glossary

Activity centre: location where a range of activities (retail, commercial, civic, institutional, cultural, residential), that result in significant economic activity and job creation, are encouraged to agglomerate.

Activity corridor: are movement corridors servicing or connecting activity centres, and are principally concerned with establishing good access, including strong public transport, and higher residential densities, along the route.

Bioretention structure/system: also referred to as rain garden. (refer page 42)

Consumer services: have a high transaction frequency, need to locate in close proximity to their customer base and often locate in commercial centres. These services typically include estate agents, travel agents and shoe repair.

Development contribution: a fee or contribution charged against a development for the provision of infrastructure.

Employment self-sufficiency: describes the number of jobs available as a percentage of the working population.

Employment self-containment: describes the proportion of the local working population that actually work locally.

Export: refers to business in which Perth or WA has a comparative advantage, where growth and development is through exports and revenue from outside. Export jobs are producer services occurring in strategic industries – mining, oil, gas and marine. In WA, these strategic industries tend to require significant supporting physical infrastructure.

Greenfield development: a large area of undeveloped land zoned for urban development and located on the fringe of an urban area.

Hectare: unit of land area equal to 10,000 m² or approximately 2.47 acres.

Hydrology: the study of water, its properties, distribution and usage on and below the earth’s surface.

Hydrogeology: the study of groundwater, groundwater flows, quality and the distribution of aquifers.

Knowledge-intensive consumer services: are specialist services dealing directly with consumers, yet typically have a higher productivity and lower transaction frequency. Depending on the scale of operations, may locate in commercial centres or in town centre locations. Typically includes general medical practitioners, accountants, veterinarians and legal services.

Knowledge-intensive producer services: these services involve business to business transactions, often less frequently but with a higher monetary value due to the intellectual property or knowledge involved. Businesses generally locate near their client businesses, although they can be relatively “footloose” due to the frequency of transactions and where good communication infrastructure allows. Typically includes engineers, architects, scientists, IT software developers.
**Mixed use development:** the compatible mixing of a range of uses, integrated in close proximity to each other to improve the efficiency and amenity of neighbourhoods, reduce travel demand, increase walkability, and make more efficient use of available space and buildings.

**Participation rate:** represents the proportion of the population either working or actively seeking work.

**Population-driven employment:** describes employment in businesses and services that serve the local population, and which generally include retail (shops), consumer services (business to consumer transactions), producer services (business to business transactions), and some knowledge intensive consumer services.

**Producer services:** these services deal directly with other businesses rather than consumers, and need to locate close to the businesses they serve. Typically these services include distribution of goods, manufacturing and construction.

**Public drinking water source area:** catchment area of a surface water source (reservoir) or recharge area of a groundwater source (borefield).

**Palusplain:** an area which is seasonally inundated by water.

**Residential density:** means dwellings per hectare of a development site or aggregation of sites. It is designated on plans as dwellings per site hectare.

**Retail:** retail jobs have high transaction intensity and are driven by the needs of the local population. Retail tenancies must locate in close proximity to their consumer catchment, to facilitate the purchase of retail goods on a frequent basis. This can be daily or weekly for convenience goods (groceries, newspapers) or less frequently for comparison goods (clothing, homewares). Retail is generally concentrated in centres with a supermarket anchor, to maximise transactions and reduce consumer trips.

**Strategic employment or knowledge-intensive and export oriented employment:** describes employment in knowledge-intensive producer services (with higher levels of skills and training) and export oriented business (where revenue is generated outside the area). Innovation and productivity, as key generators in the economy, are generally associated with this form of employment.

**Structure plan:** means a plan showing in outline the overall development intentions for an area, including land use, major transport and utility networks, drainage and/or urban water management, open space systems and indicative built form. Also known as an outline development plan. Addresses the elements of Liveable Neighbourhoods.

**Urban density:** is the dwelling yield from a hectare of residential land comprising 10% public open space, 25% streets and 65% lots.

**Walkable catchment:** the actual area served in a 400 metre (five minute) or 800 metres (10 minute) walking distance along the street system from a public transport stop, town or neighbourhood centre.
### Appendix C: Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
</tr>
<tr>
<td>BMP</td>
<td>best management practices</td>
</tr>
<tr>
<td>BUWM</td>
<td>Better Urban Water Management</td>
</tr>
<tr>
<td>C</td>
<td>celsius</td>
</tr>
<tr>
<td>CBD</td>
<td>central business district</td>
</tr>
<tr>
<td>CCW</td>
<td>conservation category wetlands</td>
</tr>
<tr>
<td>CS</td>
<td>consumer services</td>
</tr>
<tr>
<td>DAFWA</td>
<td>Department of Agriculture and Food Western Australia</td>
</tr>
<tr>
<td>DEC</td>
<td>Department of Environment and Conservation</td>
</tr>
<tr>
<td>DEWHA</td>
<td>Department of Environment, Water, Heritage and the Arts</td>
</tr>
<tr>
<td>DIA</td>
<td>Department of Indigenous Affairs</td>
</tr>
<tr>
<td>DoE</td>
<td>Department of Environment (Now DEC)</td>
</tr>
<tr>
<td>DoW</td>
<td>Department of Water</td>
</tr>
<tr>
<td>DPI</td>
<td>Department of the Premier and Cabinet</td>
</tr>
<tr>
<td>DRF</td>
<td>declared rare fauna</td>
</tr>
<tr>
<td>DWMP</td>
<td>drainage and water management plan</td>
</tr>
<tr>
<td>EPA</td>
<td>Environmental Protection Authority</td>
</tr>
<tr>
<td>ESC</td>
<td>employment self-containment</td>
</tr>
<tr>
<td>ESS</td>
<td>employment self-sufficiency</td>
</tr>
<tr>
<td>GL</td>
<td>gigalitre (one million kilolitres)</td>
</tr>
<tr>
<td>ha</td>
<td>hectare</td>
</tr>
<tr>
<td>KICS</td>
<td>knowledge intensive consumer services</td>
</tr>
<tr>
<td>KIPS</td>
<td>knowledge intensive producer services</td>
</tr>
<tr>
<td>kL</td>
<td>kilolitre (1 thousand litres)</td>
</tr>
<tr>
<td>m</td>
<td>metre</td>
</tr>
<tr>
<td>ML</td>
<td>megalitre (one thousand kilolitres)</td>
</tr>
<tr>
<td>MRS</td>
<td>Metropolitan Region Scheme</td>
</tr>
<tr>
<td>MRWA</td>
<td>Main Roads WA</td>
</tr>
<tr>
<td>MUW</td>
<td>multiple use wetlands</td>
</tr>
<tr>
<td>PBP</td>
<td>Perth Biodiversity Project</td>
</tr>
<tr>
<td>PDWSA</td>
<td>public drinking water source area</td>
</tr>
<tr>
<td>PEC</td>
<td>priority ecological communities</td>
</tr>
<tr>
<td>PRPC</td>
<td>Peel Region Planning Committee</td>
</tr>
<tr>
<td>PRS</td>
<td>Peel Region Scheme</td>
</tr>
<tr>
<td>PS</td>
<td>position statement</td>
</tr>
<tr>
<td>PS</td>
<td>producer services</td>
</tr>
<tr>
<td>REW</td>
<td>resource enhancement wetlands</td>
</tr>
<tr>
<td>SPF</td>
<td>specially protected fauna</td>
</tr>
<tr>
<td>SPP</td>
<td>state planning policy</td>
</tr>
<tr>
<td>SWBP</td>
<td>South West Biodiversity Project</td>
</tr>
<tr>
<td>SWREL</td>
<td>South West Regional Ecological Linkage</td>
</tr>
<tr>
<td>SWS</td>
<td>State Water Strategy</td>
</tr>
<tr>
<td>TEC</td>
<td>threatened ecological communities</td>
</tr>
<tr>
<td>TOD</td>
<td>transit oriented development</td>
</tr>
<tr>
<td>TP</td>
<td>treatment plant</td>
</tr>
<tr>
<td>WALGA</td>
<td>Western Australian Local Government Association</td>
</tr>
<tr>
<td>WAPC</td>
<td>Western Australian Planning Commission</td>
</tr>
<tr>
<td>WQIP</td>
<td>water quality improvement plan</td>
</tr>
<tr>
<td>WSUD</td>
<td>water sensitive urban design</td>
</tr>
<tr>
<td>WWTP</td>
<td>wastewater treatment plant</td>
</tr>
</tbody>
</table>
Southern Metropolitan and Peel Sub-Regional Structure Plan

Public submission form

The Western Australian Planning Commission is seeking public comment on this draft Southern Metropolitan and Peel Sub-Regional Structure Plan.
All comments received will be considered by the DPI before the final document is released.
All submissions will be treated in the strictest confidence.
When making a submission, it is very helpful to:
- clearly state your opinion and the reasons for your opinion;
- if possible, outline possible alternatives or solutions to your area of interest;
- if possible, include the section or page number which relates to your area of interest; and
- provide any additional information to support your comments.

If you prefer to make a comment in an alternative format, please remember to include the relevant details as outlined on the submission form.

The closing date for submissions is 5 pm 23 September 2009

If you would like more information on making a submission, please contact:
Project Officer
Southern Metropolitan and Peel Sub-Regional Structure Plan
Tel: 08 9264 7777
Fax: 08 9264 7566
Email: corporate@planning.wa.gov.au
Web: www.planning.wa.gov.au

Submissions can be forwarded to:
Southern Metropolitan and Peel Sub-Regional Structure Plan
Department for Planning and Infrastructure
469 Wellington Street
Perth Western Australia 6000

We look forward to receiving your submission
I/we would like to make the following comments on the draft Southern Metropolitan and Peel Sub-Regional Structure Plan and would like them to be considered in the preparation of the final document.

Comments: