



DRAFT ADOPTED BY COUNCIL
subject to WAPC approval

PART TWO EXPLANATORY SECTION



02 INTRODUCTION



2.1 Introduction and Purpose

2.1.1 JOONDALUP ACTIVITY CENTRE HISTORY

The JAC has established itself over the past 45 years as one of Perth's major economic centres and the major employer in Perth's northern suburbs. The successful economic development of the JAC has been based on collaborative private and public sector commitment and forward-looking investment in public infrastructure and services.

As a planned satellite city and employment centre, Joondalup has become a best practice case for planning and delivering employment precincts in suburban locations. It was envisioned more than four decades ago when the Western Australian Metropolitan Regional Planning Authority released the corridor plan for Perth which outlined the strategy for a sub-regional centre to be located within the four corridors of Perth. Each sub-regional centre was to provide an alternative to the Perth Central Business District, with a substantial range of employment, social and educational opportunities.

When the plan was released in 1970, Joondalup was identified as the northernmost of these centres, serving the northwest coastal corridor. It was also the only one of the four centres which did not already exist which lent support to subsequent planning initiatives and investments aimed at developing a greenfield centre. The JAC was held in single government ownership which supported a government-led approach.

In 1975, the State Government, Metropolitan Regional Planning Authority (now WAPC) and Shire of Wanneroo (now City of Joondalup) commissioned Professor Gordon Stephenson to prepare the Joondalup Regional Centre Plan. This plan formed the basis of much of the planning undertaken by the Joondalup Development Corporation (JDC).



Figure 13: Wanneroo Council Building (now City of Joondalup offices) and Wanneroo Hospital, 1984



The JDC was established through an Act of Parliament in 1976 to promote, secure and coordinate development. The self-funded Corporation was vested with more than 1,000 hectares of undeveloped land between 1978 and 1981, with revenue being generated through land sales. The JDC subsequently formed part of LandCorp. The City of Wanneroo retained control of development, however, the JDC maintained a role in planning decisions by advising on planning applications.

A major review of the original development plan was undertaken by Hames Sharley in 1989. The revised plan incorporated planning for the new railway line and bus/rail interchange, the major retail centre, TAFE campus and regional sporting complex. The plan and subsequent supporting development manual divided Joondalup into four main precincts as follows:

- + Core – a mix of retail, civic, cultural and major offices, with open plazas and pitched roofs encouraged;
- + Frame – low rise buildings in spacious, park-like settings;
- + Lakeside – residential development characterised by detached and terrace housing; and
- + Park – a recreational, civic and leisure focus characterised by regional open space, piazza and landscaped areas.

This plan was complemented by Metroplan in 1990 – which reaffirmed Joondalup's role as the city and employment centre of the northern metropolitan region (then expressed as Perth's second CBD).

2.1.2 JOONDALUP ACTIVITY CENTRE PLAN BACKGROUND AND PURPOSE

In 2016, the JAC is a city in transition. Since its inception over 35 years ago, the JAC has become the largest and most established centre in the North West Sub-Region (NWSR), and is therefore identified as a Strategic Metropolitan Centre under SPP 4.2.

The next stage of the JACs evolution is currently underway, supported by the strong foundations that have been established in its original master planning and subsequent development. To embrace this transition, the JAC will need to respond to radically different structures that will shape the 'future city'. As a digital city, real-time connectedness will support ongoing commercial growth, employment diversification and knowledge attraction. Joondalup as a destination will provide a platform for collaboration.

The City of Joondalup (the City) is a rapidly growing local government area at the northern gateway of the Perth Metropolitan Area. The City has a clear vision to become a more sustainable and economically diverse city that is responsive to both local and global issues and opportunities. With an increasingly mobile and economically active population, the City is trying to address unsustainable levels of out-commuting and employment self sufficiency through increasing local employment opportunities. These aspirations are set out in its 10 year Strategic Community Plan 'Joondalup 2022'. The Plan sets a clear mandate to pursue a more regionally focussed partnership approach to economic development, with a greater emphasis on delivery.

By 2031, the aim is to raise the profile of the JAC through establishing over 2,000 new businesses and over 20,000 new local jobs, supporting growth in small to medium sized businesses, attracting large businesses and public sector organisations and increasing resident and visitor numbers.

The role of the Joondalup Activity Centre Plan (JACP) is to acknowledge the history of the JAC, whilst aligning its future role and function with a strengthened identity. With this framework and direction in place, the challenge for the JACP is to articulate a spatial rationale and physical form for the JAC that can harness and support the economic expansion of the centre whilst adding to the character, distinctiveness and qualities of the built and natural environment. In this respect, the City has already made recent progress with a Draft Structure Plan for the JAC. Much of the research and investigations that have gone into the Draft Structure Plan for the JAC can be used to inform the JACP and address the requirements of SPP4.2.

The purpose of the JACP is to provide a strategic planning document that:

- + Clearly defines and articulates a vision for the JAC;
- + Establishes guiding principles and objectives that provide a framework for land use and development in the JAC; and
- + Provides clear and flexible development standards that enable quality planning and design outcomes.



2.1.3 JOONDALUP ACTIVITY CENTRE OBJECTIVES

To achieve the desired activity, movement, character and resource conservation required for the JAC to achieve its vision the following objectives apply:

2.1.3.1 GENERAL

- + Aspire to elevate Joondalup Activity Centre to a primary centre, recognised by the WAPC.
- + Promote employment self-sufficiency, self-containment and inter-regional access.
- + Provide a simple, transparent and flexible planning framework that enables development to respond to investment opportunities.

2.1.3.2 ACTIVITY

Activity refers to what is happening within the buildings (uses) as well as what is happening 'in the street' (activation). Choreography of these two aspects of activity is essential to nurturing a successful place, building capacity and ownership in the local community and attracting investment. Uses that are authentic to Joondalup and will be longer lasting and embedded into the centre are encouraged. Activity centres are always evolving and there will often be gaps in activity as they evolve. These gaps can be filled with temporary activities such as community displays, landscape or retail and commercial 'pop ups' and incubators, which often become catalysts for more permanent uses.

- + Establish significant knowledge intensive industry and employment, complemented by education.
- + Facilitate land assembly and redevelopment that will further intensify development and activity in the city centre.
- + Achieve a diverse mix of compatible uses that generate activity at all times of the day and night.
- + Establish street based retail activity outside of Lakeside Shopping Centre within the city centre.
- + Encourage increased activation of city streets and Central Walk.
- + Facilitate high density residential development in the city centre and a diversity of housing to provide choice for residents.
- + Encourage land uses that generate high concentrations of workers, residents and visitors to improve local employment self-sufficiency and self-containment.
- + Focus travel, employment and user intensive activity around public transport stations and along movement corridors.

2.1.3.3 MOVEMENT

The arrival experience of all users across all modes is an important part of a legible and connected place. A place is experienced through human journeys which are defined by the desire- lines between destinations and activities. The most critical journeys are those on foot, these journeys should be choreographed to be direct, safe and interesting and it may be appropriate to create temporary journeys.

- + Integrate and prioritise transport modes including local area transit to efficiently connect people with attractions, and destinations in the city centre and region.
- + Provide safe, functional and attractive interchange facilities and waiting areas for public transport patrons.
- + Provide safe and attractive streets and public places to enhance the pedestrian experience throughout JAC.
- + Strengthen east-west movement across the city with pedestrian/cycle connections between

Mitchell Freeway, Joondalup West, the CCP and Lake Joondalup.

- + Reduce transport conflict by providing dedicated cycle lanes, footpaths separated from vehicles and minimal vehicle crossovers in the city centre.
- + Provide car parking commensurate with the road network capacity.
- + Promote short-term, public on-street car parking in highly accessible areas.
- + Consolidate car parking, encourage reciprocal public use and consolidate access to reduce the dominance of cars in the urban landscape.
- + Provide adequate bicycle parking and end of trip facilities to promote cycling trips within JAC.

2.1.3.4 URBAN FORM (CHARACTER)

The future place character of Joondalup will be realised through the form and quality of the buildings, the landscape, the streetscape and the public realm. There will be demolition and redevelopment and existing built form will be replaced with more intense and diverse buildings, enabling new investment in the JAC.

- + Create an identifiable and unique civic heart that is enlivened and activated through a series of connected city squares, each with a unique character and function.
- + Create an attractive city centre that sets Joondalup apart through the use of high-quality design, materials, street furniture, public art, landscape and the retention of vegetation where appropriate.
- + Promote buildings with scale and character that reflects JAC's status as the primary centre of the north-west sub-region.
- + Encourage development at gateways to the city to enhance arrival and contribute to the city's character and identity.
- + Encourage increased development intensity, building scale and design quality along transport corridors to appropriately frame the city centre.
- + Encourage buildings and development that are able to adapt to changing economic, technological, environmental and social conditions.
- + Encourage buildings that have a well-considered relationship to the street, enabling the city to become more intense and active while retaining a human scale.
- + Enhance the natural environment and emphasise the existing 'bush' identity and landscape quality throughout the JAC.

2.1.3.5 RESOURCE CONSERVATION

- + Adopt an environmentally sustainable approach to development within the JAC.
- + Create a green open space and landscaped street network to lessen the heat island effect of city development.
- + Encourage conservation of resources, including reduced waste and energy and water use.
- + Encourage solar access, natural cross ventilation and renewable energy use in buildings.
- + Maximise solar access and good microclimate conditions in public open spaces and city squares.
- + Optimise water quality management outcomes.



03 CENTRE CONTEXT

3.1 Planning Framework

3.1.1 ZONING AND RESERVATIONS

3.1.1.1 METROPOLITAN REGION SCHEME

Pursuant to the Metropolitan Region Scheme (WAPC, 2012), the JAC is comprised of two zones:

- + Majority of the subject land is zoned 'Central City Area'.
- + The remainder of the subject site is zoned 'Urban'.
- + Joondalup Drive, Hodges Drive and Shenton Avenue are reserved as 'Other Regional Roads'.

The current MRS zoning allows for the land use and development contemplated in the JACP.

3.1.1.2 CITY OF JOONDALUP LOCAL PLANNING SCHEME NO.3 (LPS3)

The JAC is zoned 'Centre' under LPS3. The intention of the 'Centre' zone is to "accommodate existing and proposed business centres varying in size from local centres to strategic metropolitan centres, and provides for the co-ordinated planning and development of these centres or other planning precincts where the council considers that an Agreed Structure Plan is necessary".

The objectives of the 'Centre' zone under LPS3 are to:

- + Provide for a hierarchy of centres from local centres to strategic metropolitan centres, catering for the diverse needs of the community for goods and services;
- + Ensure that the city's commercial centres are integrated and complement one another in the range of retail, commercial, entertainment and community services and activities they provide for residents, workers and visitors;
- + Encourage development within centres to create an attractive urban environment;
- + Provide the opportunity for the coordinated and comprehensive planning and development of centres through an Agreed Structure Plan process.

Succinctly, the current zoning of 'Centre' allows for the designation of land within the JAC for future development as an activity centre and provides a basis for future detailed planning in accordance with the JACP. Under LPS3, any major development on land within the 'Centre' zone which is partly or wholly within an activity centre shall not be approved unless an activity centre structure plan has been prepared and adopted in accordance with the requirement of SPP 4.2 and the requirements of Part 9 of LPS3 (Structure Plans).

Note: LPS3 is currently going through the final statutory processes prior to final adoption by the City.



3.1.2 STATE AND REGIONAL PLANNING FRAMEWORK

3.1.2.1 *DRAFT STATE PLANNING STRATEGY (2014)*

The Draft State Planning Strategy (WAPC, 2014) is the preeminent strategic planning instrument for Western Australia, providing strategic direction for the State to 2050 and beyond. It informs State, regional and local planning strategies, policies and approvals.

3.1.2.2 *STATE PLANNING POLICY 3.1 – RESIDENTIAL DESIGN CODES (2013)*

The Residential Design Codes (R-Codes) provide a basis for administering the control of residential development in Western Australia. The R-Codes aim to address emerging design trends, promote sustainability, improve clarity and facilitate better residential design outcomes.

The provisions of the R-Codes are supplementary to the LPS3 and apply to certain zones within the JACP area.

3.1.2.3 *STATE PLANNING POLICY 4.2 (SPP4.2) – ACTIVITY CENTRES FOR PERTH AND PEEL (2010)*

Joondalup is classified as a Strategic Metropolitan Centre (SMC) within the Activity Centres hierarchy identified in SPP4.2. SPP 4.2 specifies the broad function, characteristics and performance targets for Joondalup to meet as a SMC. **Table 4** and **Table 5** outline the current performance of Joondalup with regard to the requirements of SPP 4.2.

3.1.2.4 *LIVEABLE NEIGHBOURHOODS (2015)*

Liveable Neighbourhoods is a WAPC operational policy which aims to implement the objectives of the State Planning Strategy, guiding sustainable development in Western Australia. It addresses both strategic and operational aspects and can be applied in the design and assessment of structure plans and subdivision for new urban areas in the Perth Metropolitan Region. Liveable Neighbourhoods is applied in the City of Joondalup in the design and approval of urban development, structure planning and subdivision for greenfield sites and for the redevelopment of large brownfield and urban infill sites.

3.1.2.5 *DEVELOPMENT CONTROL POLICY 1.6 – PLANNING TO SUPPORT TRANSIT USE AND TRANSIT ORIENTED DEVELOPMENT (2006)*

Development Control Policy 1.6 seeks to maximise the benefits to the community of an effective and well used public transit system by promoting planning and development outcomes that will support and sustain public transport use.

The policy applies to all transit precincts within the State and includes land within 10-15 minutes walking time or within an 800 metre radius of Edgewater and Joondalup Train Stations. The policy is applied by the WAPC and as such provides guidance when formulating the development provisions of land in these locations.

3.1.2.6 *DIRECTIONS 2031 AND BEYOND (2010)*

Directions 2031 and Beyond (Directions 2031) establishes a vision for future growth for the metropolitan Perth and Peel region and provides a framework to guide the detailed planning and delivery of housing, infrastructure and services.

Directions 2031 identifies a network and hierarchy of activity centres which are hubs that attract people to live, work and play. Joondalup has been designated as a Strategic Metropolitan Centre within the North-West Sub-Region (NWSR). The NWSRs population is estimated to grow from 285,000 to 395,000 in 2031, requiring an extra 65,000 dwellings (WAPC, 2010). This population estimate may be conservative according to more recent data. The recently released Draft Perth and Peel@3.5million Strategy (WAPC) estimates a population of 546,423 for the NWSR by 2031.

Directions 2031 notes a relatively weak local employment base in the NWSR and seeks an increase in employment self-sufficiency from 41% to 60%, requiring 72,000 additional jobs located in the sub-region. A more balanced distribution of infill and greenfield housing is promoted with a target of 47% of new dwellings provided as part of infill development.

Strategies for the transport network are identified including connecting the community with employment and services, improving public transport to encourage a shift to more sustainable transport options, maximising efficiency of road infrastructure, protecting the movement economy and managing car parking. Directions 2031 also seeks to manage impacts of the growth of Perth and Peel on the natural environment. Public transport strategies from Directions 2031 were further refined in the draft Public Transport for Perth 2031 document.

3.1.2.7 OUTER METROPOLITAN SUB-REGIONAL FRAMEWORK (DIRECTIONS 2031) (2010)

The draft Outer Metropolitan Perth and Peel Sub Regional Strategy, released by the Department of Planning in August 2010, focuses on development opportunities in the outer metropolitan region in support of Directions 2031. The strategy provides guidance at the local level. It seeks to deliver the objectives of Directions 2031 with a primary focus on meeting the housing, employment and economic development needs of the Outer Metropolitan Sub-Regions.

The framework identifies a need for 11,800 to 14,100 additional dwellings in the City of Joondalup to 2031. However, no specific dwelling numbers are allocated to the Joondalup Activity Centre.

3.1.2.8 PERTH AND PEEL@3.5 MILLION AND NORTH-WESTERN SUB-REGIONAL PLANNING FRAMEWORK (2015)

The Draft Perth and Peel at 3.5 million is the most recent strategic document released by the WAPC. It forms part of a strategic suite of documents that examine how Perth will accommodate expected growth from a population of over 2 million people to 3.5 million by 2050. The document is supported by four sub-regional frameworks for the Central, North-West, North-East and South Metropolitan Peel Sub-Regions. Specifically, the strategic suite of documents seek to interpret:

- + Where future homes and jobs should be located;
- + How we can protect important environmental assets;
- + How we can best utilise existing and proposed infrastructure; and
- + Appropriate areas for greater infill development and residential density.

Key implications for JAC:

- + Almost 50,000 of the NWSR's future dwellings will be provided through a greater focus on infill development in activity centres such as Joondalup, along transport corridors and in station precincts which will have a significant impact on the JACs urban form.
- + Estimated employment self-sufficiency for the NWSR is 65% by 2031, a large proportion of these jobs will need to be located within the JAC to capitalise on access to existing services, infrastructure and transport networks.
- + Large amount of future growth in the NWSR will occur in Wanneroo and East Wanneroo, there is a need to explore opportunities to connect Wanneroo and Joondalup, potentially across Lake Joondalup.



Table 4: Activity Centre Functions, Typical Characteristics and Performance

SPP 4,2 Requirement	Strategic Metropolitan Centres	Joondalup Activity Centre				
Main Role / Function	SMCs are the main regional activity centres. They are multi-purpose centres that provide a diversity of uses and the full range of economic and community services.	JAC is the primary centre in the NWSR and main focus of employment and retail activity.				
Transport Connectivity and Accessibility	Focus for passenger rail and/or high frequency bus network.	Joondalup is serviced by two train stations rail and high frequency bus. JAC provides a key interchange for northern suburbs from the rail network to bus feeder services. The JAC has potential to establish a Local Area Transit (LAT).				
Typical Retail Types	Department store, discount department stores, supermarkets and full range of specialty shops.	Lakeside Joondalup is located within the JAC and provides the primary retail focus for the NWSR. Outside of Lakeside, JAC currently provides ancillary retailing including large format retail to the south. The JAC has a diverse retail offering providing multiple department, discount department and supermarkets.				
Typical Office Development	Major offices and State government agencies.	It has been confirmed by the State Government that State Government Agencies including the Department's of Water, Environment Regulation and Environmental Protection Authority will relocate to the JAC. The development will be located at 8 Davidson Terrace and will contain a total floor space of 9,934m ² NLA. In addition, a number of large scale commercial developments have been approved.				
Future Indicative Service Population	150,000 – 300,000 persons.	JAC currently services a catchment of approximately 350,000 people exceeding the service population of an SMC. Catchment to increase to over 500,000 by 2050.				
Walkable Catchment for Residential Density Target	800m	Majority of existing and proposed residential development in the JAC is within an 800m walkable catchment of Joondalup or Edgewater Train Stations. JACP seeks to increase residential density within the walkable catchments of both train stations to meet the density targets for SMCs.				
Residential Density Target per Gross Ha	<table border="1"> <tr> <td>Minimum</td> <td>Desirable</td> </tr> <tr> <td>30</td> <td>45</td> </tr> </table>	Minimum	Desirable	30	45	To achieve the desirable residential density for the JAC, approximately 10,000 dwellings area required within the walkable catchments of Joondalup and Edgewater Train Stations.
Minimum	Desirable					
30	45					

Centre Size: Shop / Retail floor space component	SPP 4.2 Target Mix	Joondalup Activity Centre
>100,000 sqm	50%	In 2015 the JAC had a total retail floorspace of approximately 165,000m ² . The JAC had a total floorspace of 842,400m ² , resulting in 19.5% of the total activity centre floorspace being retail.
>50,000 sqm	40%	
>20,000 sqm	30%	As the JAC provides over 100,000m ² of retail it has a target to provide a target mix of 50% for all other land uses. The JAC outperforms this target by providing a mix of 80.5% for all other land uses (2015). This demonstrates the broad scale of the City's economy and the diversity of its land uses.
>10,000 sqm	20%	
<10,000 sqm	N/A	



3.1.3 LOCAL PLANNING FRAMEWORK

3.1.3.1 STRATEGIC COMMUNITY PLAN (2014)

Joondalup 2022 – Strategic Community Plan 2012 – 2022 is the City’s overarching long term strategic planning guide for the future. It was developed through an extensive community consultation process which helped inform the final document in detail. The Strategic Community Plan sets a framework for how the City will address issues such as increased pressure on transport networks, existing infrastructure and natural assets as well as providing a guide as to how the vision and aspirations of the community and regional stakeholders will be achieved over time.

The Strategic Community Plan aims to build upon Joondalup’s recognition as the “World’s Most Liveable City” in the UN-backed annual International Awards for Liveable Communities and provides a framework to help cater for expected growth and respond to growing challenges relating to climate change, transport congestion, ageing infrastructure, financial sustainability, competition for investment attraction, ageing population and sustainable tourism.

The Strategic Community Plan sets out six key themes of:

- + Governance and Leadership
- + Financial Sustainability
- + Quality Urban Environment
- + Economic Prosperity, Vibrancy and Growth
- + The Natural Environment
- + Community Wellbeing

In terms of the JAC, the Strategic Community Plan provides the following objectives and strategic initiatives for development:

- + Promote and support bold and iconic private building developments;
- + Encourage ground level retail activities;
- + Pursue development of commercial office buildings;
- + Pursue development of a Joondalup Performing Arts and Cultural Centre;
- + Review of District Planning Scheme No.3;
- + Develop an Integrated Transport Planning Plan; and
- + Undertake an asset management review.

3.1.3.2 DRAFT JOONDALUP CITY CENTRE STRUCTURE PLAN

The draft Joondalup City Centre Structure Plan is intended to facilitate the growth of a city that demonstrates an intense mix of opportunities to live, work, play and learn with convenient transport links to the surrounding region. It has been adopted by Council and is required to be endorsed by the Western Australian Planning Commission prior to its finalisation and implementation.

The draft Joondalup City Centre Structure Plan includes provisions that:

- + Encourage commercial development with suitable and substantial height and bulk within the CCP through measures, such as:
 - Removing plot ratio restrictions.
 - Applying minimum heights but no height limits.
 - Amalgamating land to allow for larger development sites.
 - Relaxing parking requirements.
- + Require quality commercial and mixed-use development by way of public art, materials, public spaces and forecourts, and architectural features.
- + Ensure street frontages are pedestrian-friendly and active through a range of measures, such as prohibiting residential uses on ground floors, permitting alfresco areas, providing visually permeable facades, and protecting pedestrians from weather events.
- + Provide an appropriate balance of commercial and residential development in the JAC, with particular emphasis on preventing exclusive residential development at the expense of commercial development.
- + Replace the Residential Design Codes with specific provisions for height, setbacks, amount of residential development permitted, open space, and parking. Investigate removing provisions regarding density, minimum site area per dwelling, or plot ratio to allow more flexible development.

3.1.3.3 CITY OF JOONDALUP LOCAL PLANNING STRATEGY (2014)

The City of Joondalup Local Planning Strategy provides strategic planning direction for the City for the next 15 to 20 years. The strategic direction for the JAC is outlined in the LPS and underpins JACP.

More specifically, the LPS identifies the following actions for JAC:

- + Greater connectivity between major activity generators such as the Joondalup Learning Precinct, Joondalup Health Campus, Lakeside Joondalup Shopping Centre, Joondalup transit hub and CCP.
- + Edgewater Train Station and Joondalup Gate Retail Park to become a future transit orientated development node.
- + Improve activation of streetscapes and public space, including addressing ground floor interface issues associated with Central Walk.
- + JAC to be recognised as a Primary Centre.
- + Development of detailed district specific guidelines to guide the built form within the Centre, whilst maintaining appropriate flexibility to allow non-conventional design and innovation.



3.1.3.4 CITY OF JOONDALUP LOCAL HOUSING STRATEGY (2013)

The Local Housing Strategy (LHS) provides the City with a firm rationale for determining future housing needs and recommends appropriate policy measures for provision of a range of housing types and densities. JAC has been identified in the LHS as the primary focus for high-density residential development, due to its proximity to major transport hubs, employment and retail centres.

The following opportunities have been identified for JAC:

- + High density dwellings to increase over time given the availability of land within JAC.
- + Redevelopment through the demolition of existing buildings, in order to facilitate increased density and building heights.
- + JAC is currently subject to a separate set of planning controls through the Draft Joondalup City Centre Structure Plan, which facilitate high density developments.

3.1.3.5 CITY OF JOONDALUP LOCAL COMMERCIAL STRATEGY (2013)

The Local Commercial Strategy (LCS) provides detailed analysis and information to guide growth and future decision making of activity centres within the City. The strategy provides a framework to inform decision making with respect to the growth and maturation of activity centres within the City.

The following was identified for JAC:

- + JAC is well positioned to take on the role of a Primary Centre. However, it needs to build on existing assets to achieve the scale required of a primary centre.
- + Essential for land uses in JAC to intensify and diversify to maximise the amount of residential infill within the centre catchment. There is a strong focus on increasing employment self-sufficiency with a target of 60% the current employment self-sufficiency for the City is 46.4% and employment self-containment is 26.7%.
- + To meet the City's employment self-sufficiency and self-containment targets JAC must attract economic activity that goes beyond the region. This requires scale and diversity to achieve the agglomeration economies that flow from the vertical and horizontal integration that is possible in a larger, more diverse centre.
- + The JAC has the capacity to reach a total floor space of 860,000 m² within 20 years. With a potential commercial floor space of approximately 2,000 m² per hectare, this is comparable to one third of the commercial floor space density in the Perth CBD.
- + The co-location of health, education and a substantial city centre is uncommon among activity centres within in Western Australia.

3.1.3.6 JOONDALUP ECONOMIC DEVELOPMENT STRATEGY (2014)

The City has prepared an Economic Development Strategy, 'Expanding Horizons'. The strategy considers the issues and challenges that face the City with the primary aim being to attract new investment, encourage innovation and support the growth of the business sector to increase job opportunities for local people.

The Economic Development Strategy aims to leverage the City's physical, technological and intellectual assets and encourage a culture of innovation, investment and entrepreneurship. Ultimately this approach will expand the horizons of the local community, businesses, students, workers and potential investors. It has already attracted positive feedback from stakeholders in the local community, key business and industry associations and major institutions.

3.1.3.7 JOONDALUP: DIGITAL CITY (2013)

The City of Joondalup Digital City (2013) strategy proposes a vision for Joondalup's future, enhanced by broadband and digital technologies, with strategies that tie directly in to the aspirations identified in the Community Plan.

Three key issues for Joondalup as a Digital City are:

1. 60% of Joondalup residents leave the City each day to attend their place of work.
2. Existing small business sector lacks the capacity, capability and skills to participate fully in the digital economy.
3. Opportunities to create and attract new digital economy businesses based on the City's strengths are not being fully realised.

Key strategies for the JAC to meet the key actions for Joondalup are:

1. Lead and position Joondalup as a Digital City.
2. Build infrastructure, platforms and content.
3. Establish a Digital City Hub: as a physical and virtual space, combining telecommuting, start-up and business capacity centre.
4. Establish a virtual and physical space that creates opportunities for start-ups.
5. Deliver capacity building programs and confidence for Joondalup small business.
6. Actively grow the City's internal digital capacity.
7. Realise Joondalup's potential as an Education City.
8. Grow and attract new business in innovative sectors.
9. Build community capacity and innovative government services.

The digital city hub foundation members to include: Joondalup Business Community, State and Federal Government, the City of Joondalup, ECU, WCI, innovative start-up businesses, WA Police Academy, Spacecubed, ICT industry bodies.

Programs - Each member would use the centre to deliver a suite of programs related to business capacity building and innovation support. The State Government and residents would use the centre to enable employees to telework.



3.2 Regional Context

The JAC is located within the City and suburb of Joondalup, approximately 28km north of the Perth CBD. The JAC is well connected to Perth by car and public transport (rail and bus), the Mitchell Freeway and the Perth-Butler train line provide north-south linkages between Joondalup and the Perth CBD. It is also accessed by major east-west distributor roads such as Ocean Reef Road and Burns Beach Road.

3.2.1 CENTRE HIERARCHY

The JAC is designated as a SMC under SPP 4.2 and Directions 2031 and Beyond. Yanchep is the only other SMC in the NWSR, however, it is identified as a future centre which will rely on future population growth. It is situated within the North-West Sub-Region (NWSR). **Figure 16** illustrates the activity centre hierarchy for centres north of the Swan River.

The JAC is the largest and most established SMC in Perth and the NWSR. Due to its existing geographic and economic advantages, the JAC already has a broad economic base and high value-adding industries, with high employment in health, education, and retail sectors, including a growing government administration component. The centre also has an establishing commercial office market, accommodating financial, insurance, law and professional services, and has residential areas that can accommodate additional density. It is a major candidate to be elevated to Primary Centre and become a second CBD in Perth.

3.2.2 CATCHMENT AREA

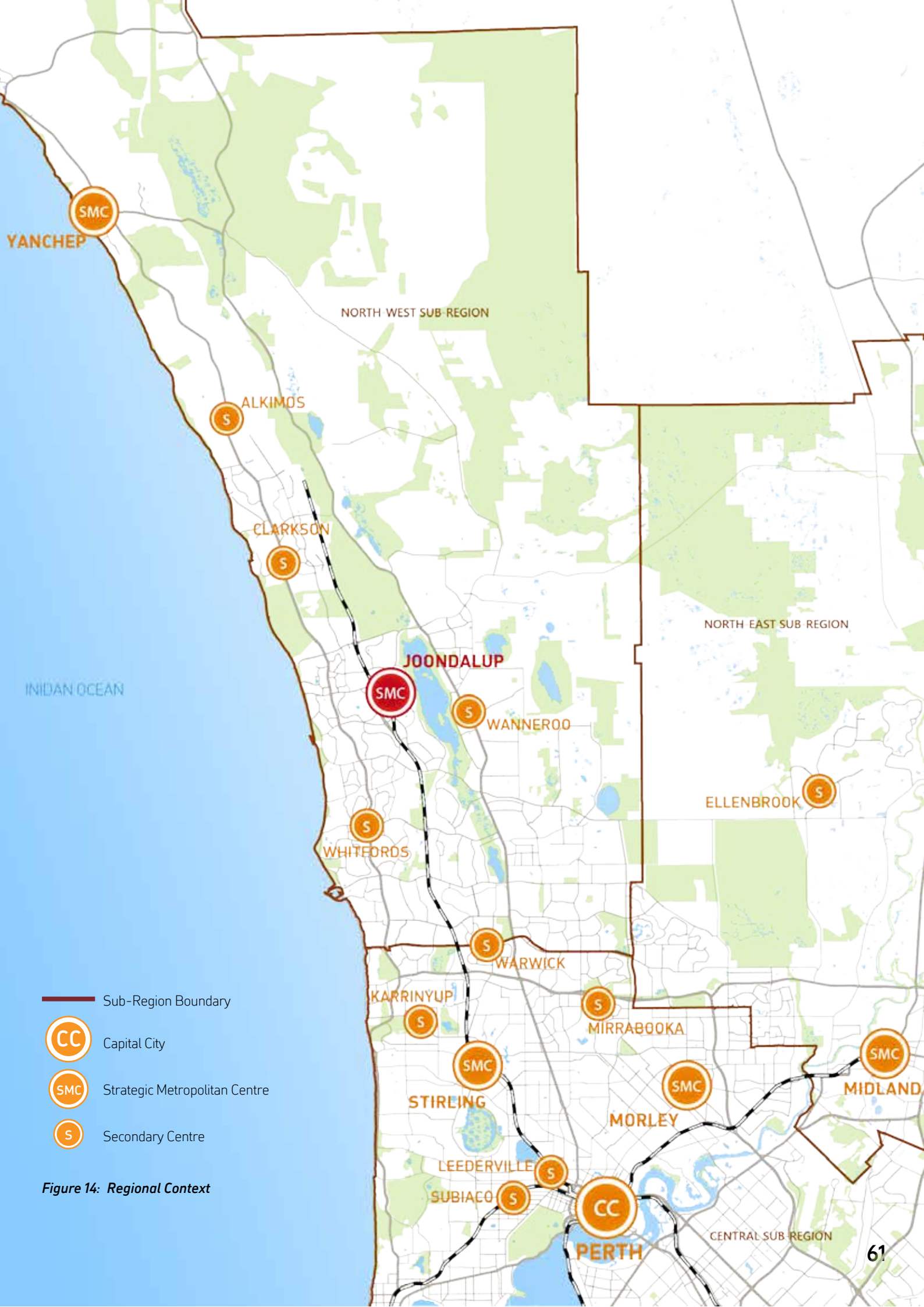
JAC services an extensive catchment of approximately 350,000 residents and 180,000 workers and with 42% of metropolitan Perth's stock of undeveloped zones land in this corridor the region's population will more than double by 2050. The NWSR is one of the fastest growing residential locations in Australia and is projected to accommodate the largest growth in population out of any sub-region in Perth or Peel over the next 35 years. This has significant implications on the future planning of the JAC, with increasing pressure on regional transport networks, existing infrastructure and natural assets.

Perth and Peel@3.5million indicates that the NWSR had a total population of 322,486 in 2011. As the JAC is the primary centre within this corridor it currently services much of this catchment. Lakeside Shopping Centre postcode surveys indicate that the centre is also serviced by a regional population including residents in coastal areas (north of Yanchep) and the Northern Wheatbelt, demonstrating the extent of the existing catchment. It is expected that as Yanchep develops the geographic extent of the catchment may decrease, however, significant infill and greenfield growth planned for the NWSR will see the catchments overall population increase. The Department of Planning project that the NWSR will more than double by 2050 accommodating over 740,000 people, majority of which will service the JAC.

3.2.3 NEIGHBOURING ATTRACTORS

The major attractors in the City of Joondalup include Ocean Reef Marina, Hillarys Boat Harbour, the broader Sunset Coast, Yellagonga Regional Park and Yanchep National Park. These are major attractors for the NWSR and key drivers of the local economy. Due to its proximity the JAC has potential to provide a complementary role in servicing these attractors particularly as public transport connectivity is improved.

A key example of this is the City's vision for a defined public transport connection between the JAC and Ocean Reef Marina. The City holds a vision for the Ocean Reef Marina to become a world class recreational, residential and tourism development that encapsulates high levels of environmental sustainability, community amenity and delivers economic growth and social benefit to the residents of the City and the broader region.







-  Sub-Region Boundary
-  Capital City
-  Strategic Metropolitan Centre
-  Secondary Centre

Figure 14: Regional Context



3.2.4 POPULATION AND DEMOGRAPHICS

A demographic analysis was undertaken to get an understanding of the population and dwelling characteristics for the JAC in comparison to the wider City of Joondalup. Demographic data for the City was obtained from the 2011 census and id. (the population experts) who provide data specific to the JAC.

In 2015 the JAC had a residential population of 4,419 which made up 2.6% of the entire City of Joondalup population.

Demographics Characteristics

The resident population within the JAC has a number of key attributes which have been assessed based on the 2011 Census of Population and Housing and include :

Young adult population

- + 48.4% of residents are aged between 15 and 34 years of age compared to 29.0% across Greater Perth. This includes a high number of young adults living in student accommodation and rental accommodation on the southern portion of ECU;

Few young families and children

- + 7.1% of the population are aged below 15 years of age compared to 19.2% across Greater Perth;

Few indigenous residents

- + 0.4% of residents identify themselves as being Aboriginal or Torres Strait Islanders;

High overseas-born population

- + 57.1% of residents were born overseas compared to 40.4% across Greater Perth. More than one in five residents (23.1%) speak other than English at home and only 63.0% of the population have Australian citizenship.

Smaller households

- + The average household size in JAC is 2.17 people compared to 2.73 people in the broader City. This represents the much smaller proportion of households with children when compared to the broader City.

Higher housing diversity

- + The JAC has a much greater percentage of medium and high density housing when compared to the broader City. This is due to the nature and scale of the JAC which is better suited to higher density dwelling options such as apartments.

Demographic Snapshot - 2011 Census of Population and Housing

	Joondalup Activity Centre		City of Joondalup	
POPULATION	Population 2006	3,150	Population 2006	149,675
	Population 2011	3,979	Population 2011	152,401
	Growth 2006-2011	26.3%	Growth 2006-2011	1.8%
AGE SUMMARY	Age 0-14	7.3%	Age 0-14	19.3%
	Age 15-24	27.2%	Age 15-24	15.1%
	Age 25-44	30.8%	Age 25-44	25.2%
	Age 45-64	23.5%	Age 45-64	29.5%
	Age 65+	11.6%	Age 65+	10.8%
	Median Age	31.7	Median Age	38
HOUSEHOLD	Household Size	2.17	Household Size	2.73
	With Children ¹	21.6%	With Children ¹	51.2%
	Without Children ²	29.7%	Without Children ²	16.6%
	Lone Person	25.1%	Lone Person	16.2%
	Group Household	9.9%	Group Household	2.6%
DWELLINGS	Dwellings 2006	1,594	Dwellings 2006	56,559
	Dwellings 2011	1,921	Dwellings 2011	58,560
	Growth 2006-2011	20.5%	Growth 2006-2011	3.5%
	Separate House	18.6%	Separate House	90.4%
	Medium Density	39.5%	Medium Density	7.7%
	High Density	40.6%	High Density	1.6%
EMPLOYMENT	Work Full Time	56.9%	Work Full Time	58.3%
	Work Part Time	31.6%	Work Part Time	36.3%
	Unemployed	10.6%	Unemployed	3.9%
INCOME	Median Personal ³	\$643	Median Personal ³	\$718
	Median Household ³	\$1,402	Median Household ³	\$1,780
	Median Rent	\$368	Median Rent	\$370

1 - denotes couple and single parent households with children.

2 - denotes couple households without children.

3 - denotes weekly income or payment.



3.3 Local Context

3.3.1 LAND DESCRIPTION

3.3.1.1 LOCATION

The JAC is defined by the boundary indicated on **Figure 17**. The boundary is based on the Joondalup City Centre boundary identified in the Draft Joondalup City Centre Structure Plan, with the added inclusion of the Edgewater Quarry site. The JAC, is generally bounded by the Mitchell Freeway Reserve to the west, Yellagonga Regional Park to the east and the existing residential suburbs of Currambine to the north and Edgewater to the south.

The purpose of the JACP boundary is to:

- + Identify the extent of applicability of the structure plan and policy.
- + Estimate the growth potential and land use mix of the centre.
- + Manage the interface between scaled development and adjacent land.

3.3.1.2 AREA AND LAND USE

The JAC is approximately 488ha in size and is comprised by a variety of land uses. These are detailed in **Section 5 - Activity** and include:

- + Civic;
- + Retail;
- + Commercial;
- + Education;
- + Health;
- + Service Industry;
- + Sports and Recreation;
- + Open Space; and
- + Residential.



Figure 15: Joondalup Activity Centre Plan - Area



3.3.2 SITE CONDITIONS AND CONSTRAINTS

3.3.2.1 BIODIVERSITY AND NATURAL ASSETS

Biodiversity Areas

The City of Joondalup is situated on the Swan Coastal Plain, the City consists of a number of diverse environmental areas including coastal areas, wetlands and bushland. Persistent and ongoing urbanisation of the City has increased pressure on ecological communities within the municipality.

The City's biodiversity areas are categorised into four zones:

- + Wetlands Zone;
- + Coastal Zones;
- + Coastal Bush Zone; and
- + Marine Zone.

Whilst the JAC is predominantly urbanised, the eastern border is situated adjacent to the Wetlands Zone and Yellagonga Regional Park, which incorporates Lake Joondalup. Yellagonga Regional Park has significant importance in relation to the natural amenity of the area, containing some of the oldest remaining freshwater systems on the Swan Coastal Plain. The Park has a dynamic ecosystem which is home to a variety of local flora and fauna. It is also listed as a Bush Forever Site (no. 299).

Threatened Ecological Communities and Flora and Fauna

Joondalup's history as a primary centre for the northern metropolitan area has led to a highly urbanised environment. As a result the area has been extensively cleared over time.

The 'Wildlife Conservation Act 1950' lists threatened native plants and threatened native animals to be specially protected as they are under identifiable threat of extinction; rare; or in need of special protection.

A threatened ecological community (TEC) may be deemed threatened if it is presumed to be, or is at risk of being totally destroyed. Categories include "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable".

A Priority Three category TEC is located within JAC. Priority Three is described as a: Poorly known ecological communities. The Southern Eucalyptus (*gomphocephala-Agonis flexuosa*) woodlands. These communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them. There are five threatened priority flora, the conservation status of all five sites is Priority Four: Rare, Near Threatened and other species in need of monitoring.

The Department of Environment and Regulation has announced that the Federal Minister has approved to list the Banksia Woodlands of the Swan Coastal Plain as an Endangered ecological community under the EPBC Act. The status came into effective on 16 September 2016.

The key objective of the listing is to mitigate the risk of extinction of the Banksia Woodlands of the Swan Coastal Plain ecological community, and maintain its biodiversity and function, through the protections provided under the Environment Protection and Biodiversity Conservation Act 1999 and through the implementation of priority conservation actions.

Banksia Woodland communities is the vegetation type that supports Carnaby's Black Cockatoo within the Swan Coastal Plain.

Banksia Woodlands is a dominant vegetation community within the City of Joondalup which is characterised by a canopy which is dominated or co-dominated by the following species:

- + *Banksia attenuata* (candlestick banksia, slender banksia) and/or *B. menziesii* (firewood banksia).
- + Other trees of a medium height that may be also be present and may include *Eucalyptus tottiana* (blackbutt, pricklybark), *Nuytsia floribunda* (Western Australian Christmas tree), *Allocasuarina fraseriana* (western sheoak), *Callitris arenaria* (sandplain cypress), *Callitris pyramidalis* (swamp cypress) and *Xylomelum occidentale* (woody pear).
- + Emergent taller trees that can occur above the Banksia canopy may include *Corymbia calophylla*(marri), *Eucalyptus gomphocephala* (tuart) and *E. marginata* (jarrah).

Under the EPBC Act proposals that are likely to have a negative impact on the ecological community will need to be referred to the Federal Government for assessment.

Natural Assets

The City is bounded by Yellagonga Regional Park to the east, which provides a unique waterside setting. The establishment of Yellagonga Regional Park has protected much of the natural environment and maintained the opportunity of an extraordinary recreational asset within easy walking distance of the JAC.

Topography

Topography in JAC is significant, the following elements have been identified:

- + Depression towards Lake Joondalup resulting in visibility from City.
- + Lakeside Joondalup Shopping Centre was founded at a lower level than the city centre.
- + Road and site levels differ which impacts visibility and frontage to the street.
- + Train line cutting has formed a significant barrier.
- + Higher areas offer potential for views of Lake Joondalup (east) and the Indian Ocean (west).

Soil Types

The JAC is geologically located on the Swan Coastal Plain. Karrakatta Sand Yellow Phase is the predominant soil type throughout the JAC, additionally some portions of land are comprised by Karrakatta Shallow Soils Phase and Spearwood Sand Phase. Other soil types located within the vicinity include Quindalup South Deep Sand Flat Phase, Quindalup South Second Dune Phase and Spearwood Wet Lake Phase.

Acid Sulphate Soil Risk

There are no areas under the risk of acid sulphate soils (ASS) within the JAC. However, adjacent Lake Joondalup has been classified as Class 1 ASS risk by the Department of Environmental Regulation. The site has a high to moderate risk of ASS occurring within 3m of the natural soil surface.

This is not likely to be an issue as the site is situated outside of the JAC, additionally it is heritage listed and development of any kind is not permitted on the site.

3.3.2.2 GROUNDWATER AND SURFACE WATER

The City's water supply is largely dependent on groundwater resources. There are three ground water formations within the City, these are the Leederville Formation, the Yarragadee Formation and the superficial formation referred to as the Gnangara Mound.



3.3.2.3 BUSHFIRE HAZARD

A Bushfire Management Plan (BMP) and Strategic Bushfire Attack Level (BAL) Contour Mapping has been prepared by Bushfire Prone Planning and represents a Strategic Level Assessment of the JAC. The main purpose of the BMP is to inform future planning by determining or indicating the Bushfire Attack Levels (BAL's) that existing lots and buildings within the JAC are potentially subject to.

It is noted that the JAC currently retains substantial amounts of native vegetation in an unmanaged state resulting in relatively high bushfire fuel loads for the area. These vegetation areas and subsequent BAL contouring significantly impact upon the transport corridors of road and rail, public congregation areas such as sports ovals, critical infrastructure such as health centres and large areas of existing residential development. As a result all future planning envisaged by the JAC needs to be managed and considered carefully in view of the BAL's.

The BMP uses BAL Contour Mapping to present the potential radiant heat impact, as Bushfire Attack Levels, from bushfire prone vegetation within 100 metres of the assessed area. Areas adjacent to and within the Activity Centre are within a designated bushfire prone area and future development within the Activity Centre requires the application of State Planning Policy No. 3.7.

In summary, the assessed bushfire risk is considered to be manageable and will be achieved by the identified stakeholders implementing and maintaining the bushfire risk management measures that are presented in the BMP.

The determination is that compliance with the bushfire protection criteria can be achieved in subsequent planning stages.

3.3.2.4 HERITAGE

Aboriginal Heritage

JAC has been the subject of extensive Aboriginal Heritage assessment. In 1998, an ethnographic survey was undertaken by Lily Bhavna Kauler. The report was titled "Cultural significance of Aboriginal sites in the Wanneroo area" the final report was prepared for Elder Harry Nannup of Aboriginal Community College, Gngangara and was published by the Heritage Council of WA.

There are nine registered Aboriginal Heritage sites related to JAC:

- + Registered Site 3316 - Lake Joondalup West;
- + Registered Site 3504 - Joondalup Waugal Egg;
- + Registered Site 3505 - Joondalup Drive Trees;
- + Registered Site 3532 - Joondalup Caves;
- + Registered Site 3533 - Bonorin Hill;
- + Registered Site 3740 - Lake Joondalup;
- + Registered Site 16273 - Scarred Trees Joondalup;
- + Registered Site 17498 - Waugal Cave, Neil Hawkins Park; and
- + Registered Site 17590 - Edgewater Burial Site.

Each of these sites is registered on the Permanent Register for Aboriginal Sites.

Cultural Heritage

Joondalup was a greenfield development planned 45 years ago. Cultural and historic heritage in JAC is not prevalent because of this. **Table 6** outlines the cultural/historic heritage sites in JAC.

Table 5: Heritage Sites in the JAC

PLACE NO.	NAME	LISTING
8898	Burial Site	Municipal Inventory
9486	Lake Joondalup Reserve, Yellagonga Regional Park	Register of the National Estate
9489	Neil Hawkins Park	Municipal Inventory
14279	Wanneroo Research Station	Register of the National Estate
14292	Ted Gibbs House	Municipal Inventory
17396	Joondalup Police Complex	No Listing

3.3.2.5 LEGAL DESCRIPTION AND OWNERSHIP

The JAC was subdivided during the 1980's and 1990's and is now predominantly under individual land ownership. This fragmentation of land ownership makes cohesive development and redevelopment difficult. Despite this, there are a few sites within JAC which are yet to be subdivided. There are also a number of major landowners (e.g. Lend Lease, LandCorp, ECU and North Metropolitan TAFE) who could assist in providing more cohesive development particularly in the central core of JAC which predominantly owned by five major landowners.

3.3.2.6 KEY STAKEHOLDERS

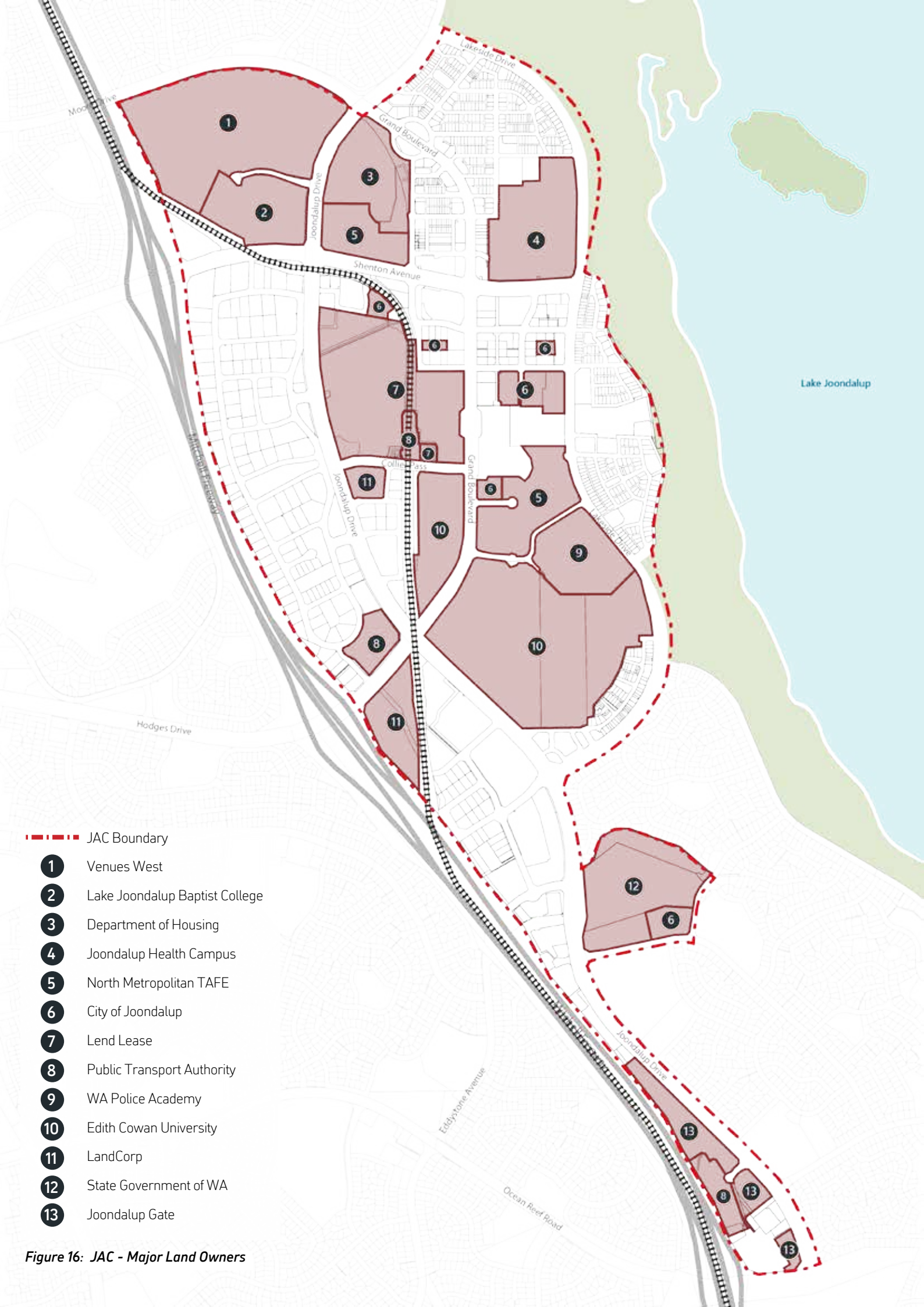
Preliminary stakeholder consultation was undertaken with major land owners identified in **Table 6**. The following considerations for the future urban form of the JAC were identified.

Figure 16 illustrates that there are thirteen significant landholdings in the JAC. The land owners include a mix of public, private and government organisations who are key stakeholders that will have a major influence on development and future urban form of the JAC. **Table 6** indicates that the major landowners identified own approximately 42% of the total JAC area.



Table 6: JAC - Major Land Owners

Landowner	Land Use	Area (ha)	% of JAC	JAC Considerations
1. Venues West	Sport and Recreation	30.12	6.15%	+ Potential for increased recreation, retail, commercial and residential uses. + Improved interface with Lake Joondalup Baptist College.
2. Lake Joondalup Baptist College	Education / Training	8.85	1.81%	+ Address parking, access and congestion issues. + Improved interface with Joondalup Arena.
3. Department of Housing	Undeveloped land	9.68	1.98%	+ Master Plan for site will provide increased residential densities north of Shenton Avenue.
4. Joondalup Health Campus	Health	13.35	2.72%	+ Aspires to be Tertiary Hospital with 1,000 beds. + Private hospital expected to double in 5 years. + Potential to orient new buildings to Shenton Avenue.
5. North Metropolitan TAFE	Education / Training	14.92	3.04%	+ Northern Campus - potential for links to health campus. + Southern Campus - potential for new development creating a new frontage to Grand Boulevard. + Opportunities to link to surrounding education and business as part of a knowledge and innovation hub.
6. City of Joondalup	Public Use (e.g. Civic and Car Parking).	9.68	1.98%	+ Aim to set a precedent in the JAC by supporting intense mixed use development of strategic sites. + Consolidate car parking in the JAC by developing existing parking sites into multi-deck car parks.
7. Lend Lease (Lakeside Shopping Centre)	Retail and Car Parking	23.78	4.85%	+ Improve integration between Joondalup Station and wider JAC + Potential to provide an entrance from Grand Boulevard. + Enhance activation of Boas Avenue and McLarty Avenue, reducing the 'internalisation' of the shopping centre. + Sleeve the shopping centre with new development along Joondalup Drive and Collier Pass frontages.
8. Public Transport Authority	Public Transport and Car parking	9.38	1.91%	+ Optimise transit oriented development potential around Edgewater Train Station. + Consolidate car parking into decks, increasing availability of developable land.
9. WA Police Academy	Education / Training	8.67	1.77%	+ No growth expected, future impact will be minimal.
10. ECU	Education / Training	44.45	9.07%	+ Predominantly internal focus on educational campus. + Support development along Grand Boulevard and Joondalup Drive to frame the JAC edges. + Improved connectivity to Motor Industry Trade Association (MITA) site across Joondalup Drive.
11. LandCorp	Undeveloped land.	11.53	2.35%	+ Opportunity to develop site west of the rail with bridge to unlock development opportunity.
12. State Government of WA	Undeveloped Land	15.3	3.12%	+ Contribute to development of Edgewater Quarry for residential. Potential for land swap with CoJ, to provide intense development fronting Joondalup Drive
13. Joondalup Gate	Bulky Goods and Retail	7.28	1.49%	+ Significant redevelopment opportunity for mixed use and high-density residential around Edgewater Train Station as a transit oriented development.
		206.98	42.24%	



- JAC Boundary
- 1** Venues West
- 2** Lake Joondalup Baptist College
- 3** Department of Housing
- 4** Joondalup Health Campus
- 5** North Metropolitan TAFE
- 6** City of Joondalup
- 7** Lend Lease
- 8** Public Transport Authority
- 9** WA Police Academy
- 10** Edith Cowan University
- 11** LandCorp
- 12** State Government of WA
- 13** Joondalup Gate

Figure 16: JAC - Major Land Owners



3.4 Pre Lodgement Consultation

A number of key stakeholders were involved in the development of the JAC. The key stakeholders were defined as those with significant landholdings or influence on the future planning and development of JAC (including the City of Joondalup). The key stakeholders and their aspirations for JAC are identified below from consultation meetings with Hames Sharley and the City of Joondalup.

3.4.1 DEPARTMENT OF HOUSING

31 March 2015

Owns a significant site adjacent the North Metropolitan TAFE (north) site. A master plan has been prepared for the site's development as a residential and mixed use precinct for approximately 2000 dwellings delivered over a 15-20 year delivery timeframe. Stage 1 will be medium density residential development on McLarty Avenue extended north from Shenton Avenue. Market analysis suggests a stages of 70-90 dwellings and questions the viability of commercial floor space.

- + There is potential for a land exchange with North Metropolitan TAFE for the corner McLarty Avenue/Shenton Avenue to improve the relationship with TAFE's future trade centre, including noise impacts for residents.
- + Topography is a challenge with a 16 metre fall across the site and the karstic terrain offers basement opportunities.
- + Access at Shenton Avenue is important to enable the precinct to be connected and integrated with the CCP.
- + The statutory framework will need consideration by the City, to resolve subdivision issues, including staging to align with road development, minimum building heights and design guidelines.

3.4.2 NORTH METROPOLITAN TAFE (FORMERLY WEST COAST INSTITUTE)

30 March 2015

Owns two sites within JAC. The McLarty Campus, to the north, is focused on health and trades with opportunities to interface with Joondalup Health Campus. Kendrew Campus, is focussed increasingly on innovation and co-working. As this campus is too small for trades to expand, a new trades centre is proposed on the McLarty campus providing an opportunity for a landmark building. Community perception is that TAFE students are school leavers as opposed to mature age, however, many students attend post- university. Courses support the construction industry as the biggest employer in the region and horticulture and landscaping may be added as courses in the future. TAFE are seeking partnerships and synergies with ECU and others – eg, partial move to Auto Institute and health placements with the hospital.

There are no master plans in place for the campuses. TAFE intends to retain all their land and is seeking a better return on assets. They are cognizant of increased residential populations around each of the colleges. Links to learning, education and business as well as public transport are important. Looking for more integration with the CCP and community. The Kendrew campus needs a more clearly defined "entrance" on Teakle Court with a 'main street' quality and 'beautiful buildings. A right hand turn from Grand Boulevard and straightening of Kendrew Crescent could assist in improving way finding and public access through the campus would be beneficial. Safety of students is an issue with a need for more activation around Central Park.

3.4.3 EDITH COWAN UNIVERSITY

31 March 2015

ECU Joondalup is now 25 years old. 12,000 students are enrolled in two semesters over 26 weeks, mainly from Perth's northern suburbs and 65% are mature age. A doubling of international students

and 10% growth of domestic students is projected. Education and nursing are the largest faculties. Customers are seen as both the students and those industries that employ them.

ECU will continue to develop the main campus for educational purposes. ECU seeks opportunity for industry partnerships with connectivity focused on engineering and health where development is capital intensive. Tenure is an issue including the 270L reserved land (ECU management order) to the centre of the campus. The indigenous landscape on campus ties into JAC character.

ECU have recently acquired the Motor Industry Trades Association (MITA) site (10 Injune Way). Opportunities include student housing, nursing and showcase for engineering. It is intended to connect this site to the campus.

3.4.3.1 UNIVERSITY CAMPUS

- + Continued synergies with other JAC uses i.e. Learning Precinct and JHC
- + Increased intensity through additional building heights and building over existing car parks.
- + Great Hall for graduations, events venue (seeking State co-investment) will be located on northwest corner- 270 Joondalup Drive
- + Other campus activity includes 25,000 visitors pa to 'ECU Pines'
- + Current soccer club lease and community based gym facilities-as alternative to Venueswest which is cost prohibitive to many.
- + Student accommodation at 98% capacity.
- + Campus will become pedestrian priority, cars limited to ring road and deck car parks proposed

3.4.3.2 ECU ENDOWMENT PRECINCT

- + Lot 9000 located at 40 Collier Pass on Grand Boulevard
- + Will connect education and research with industry.
- + Seeking private partnerships and opportunities for business enterprises
- + Projected 100,000m² commercial floor space, 6000 employees
- + 5-storey office buildings and multi-storey car park
- + Potential for government offices (State Government EOI)
- + Future use of air rights over rail corridor.

Movement issues include: safety on Joondalup Drive and around bus stops; high speeds on Grand Boulevard; traffic issues at intersection of Hodges and Joondalup Drives; black spot on corner of Grand Boulevard/Kendrew Crescent at campus entry.

50% of students use public transport (travel survey). CAT service is good and well used and ECU operate late night shuttle to train station from ECU library (7-9pm). ECU provide end of trip facilities.

3.4.4 JOONDALUP HEALTH CAMPUS

27 May 2015

Joondalup Health Campus occupies a significant area of land on the north east corner of Shenton Avenue and Grand Boulevard. The public hospital and associated medical uses service the north-west metropolitan area and a substantial expansion of the campus is to occur over the next few years.

Joondalup Health Campus (JHC) is the only major hospital located within the NWSR. The JHC offers procedures over six days with 750 beds and 3,000 staff (2,400 full time equivalent staff).

The JHC master plan (yet to be endorsed) indicates a 5 year aspiration to become a tertiary hospital with 1000 beds (300 private), additional research facilities, new paediatrics and expansion of emergency



facilities. This will be supported by a multi-storey car park on Shenton Avenue with ground floor retail. JHC will continue to strengthen linkages with ECU and Curtin University.

JHC is aware of the traffic generated by single-occupant vehicles to the site. Approximately 900-2000 bays per day are required to accommodate visitors and staff. Traffic signal phasing at the intersection of Grand Boulevard and Shenton Avenue causes queuing at the Shenton Avenue entrance. A travel plan is currently being reviewed and includes secure cycling areas and smart car usage. Pedestrian access to the site via Central Walk is considered important. Bus access is good, with stops located outside JHC on Shenton Avenue.

3.4.5 WA POLICE ACADEMY

31 March 2015

WA Police have no plans for capital expenditure at the site. Some facilities have been relocated to the Maylands facility and existing facilities are adequate. Minor works may include a physical training facility at the south-east corner (215m x 25m).

WA Police are conscious of impacts of their activities on surrounding areas. The site is an open campus, however an increased threat level could change this and require the campus to look at planning solutions (i.e. fencing precincts). Surrounding building heights are not an issue for helicopter flight paths but there are potential noise issues.

WA police have good relationships with TAFE and ECU and have used the ECU gym due to costs at the Arena. They carry out off-site physical training (eg running) in surrounding areas.

There are 150 – 300 persons on site at any time. Student numbers are static at 480 (16 schools of 30), the current natural attrition rate is 150 and numbers may decrease. 30 accommodation rooms house country recruits and international delegations and it was noted residential accommodation nearby is expensive and in short supply. Parking is at capacity and disabled access from the train station is a concern.

3.4.6 VENUES WEST

31 March 2015

HBF Arena (formerly known as Arena Joondalup) is the primary sporting and entertainment venue in Perth's North. Situated to the north of the JAC, the arena is the home ground of WAFL team the West Perth Falcons. The venue also regularly hosts large music festivals which have on occasions attracted more than 40,000 patrons. HBF Arena also provides multi-purpose sport, recreation and aquatic facilities for the local community. Joondalup is also home to the Joondalup Basketball Arena. However, the site is set to relocate to HBF Arena. Landcorp are still involved in development decisions.

The 2012 master plan has not been endorsed (referred to as concept plan only). Funding is being sought for projects including:

- + Western Oval expansion for Rugby (\$400k)
- + Netball (3 new courts and admin building)
- + Joondalup Basketball (4 new indoor courts) – 2017
- + West Perth Football "Centre of Excellence" – upgrades 2017
- + Potential for sports related retail on Joondalup Drive frontage (access and parking required)
- + Potential for residential at corner Moore Drive and Waabyn Way to capitalize on views

Venueswest has an informal parking agreement with the adjoining school and a recent traffic and parking study has identified:

- + No need for upgrades to entry and exit points
- + Peak traffic occurs on Saturday and Wednesday night
- + On- site parking inadequate for peak use (i.e. Sundays when all codes have matches). 500 bay shortfall with options to use: 300 bays around football oval and grassed area south of oval; 200 bays in sump south of Waabyn Way.

Additional issues include:

- + No fencing/security around the site, makes it accessible.
- + Vandalism at Moore Drive underpass
- + Lighting spill from Rugby field to residential properties. (review of height, angle)
- + Significant topography on Moore Drive
- + Sporting associations are located elsewhere making liaison difficult.
- + Fire access road required if Basketball Stadium built
- + Events train station would be supported
- + Summer music events contracted for next 2 years with 4 large events a year and no limit on small events
- + AFL/WAFL spectator capacity is 15,000- with potential expansion to 25,000.

3.4.7 LAKE JOONDALUP BAPTIST COLLEGE

31 March 2015

Lake Joondalup Baptist College is a private K-12 school located on the corner of Joondalup Drive and Shenton Avenue. They are looking at increasing enrolment to 1555 students by 2019 to achieve optimum operational capacity.

The school has no community links with services/businesses within the JAC, however the church uses school facilities and the school uses Joondalup Resort for larger school events.

School is preparing a site master plan and considering issues such as sustainable water use and hiring of facilities such as recreation centre. Proposed development over next 3-4 years includes:

- + Early learning 1-2 years facilities
- + New N-S spine next to recreation oval
- + Refurbishment

Other upgrades may include:

- + Extend western oval-business/hiring options, possible use of adjoining lot.
- + Shenton Avenue entrance
- + Student Central building
- + Library/Resource centre
- + Perimeter fencing

Traffic, access and student safety are key issues. Aspects include:

- + Events held at Arena create issues (vandalism) and traffic congestion.



- + Arena facility use/booking not always beneficial (cancel school if better booking)
- + Peak period congestion at 'kiss and drive'
- + Informal parking agreement (including for staff) with Arena.
- + Safety of pedestrian crossing at Shenton Avenue/Joondalup Drive signals
- + Parents reluctant to let students cycle to school given traffic issues
- + Event station – may generate further traffic, but open to station operating for school travel.

3.4.8 JOONDALUP GATE

31 March 2015

Joondalup Gate was conceived as a mixed business and showroom development and requested by WAPC in 1995 to stimulate the local economy. Land use permissibility on the strategically located 13ha site has not changed since that time. Very eager to see changes to planning framework.

There is market interest in residential on the site and a TOD plan in line with Department of Planning policy has been prepared to redevelop the site in 3-5 year stages with potential for residential up to 18-20 storey. The plan considers:

- + Ocean and lake views available at Level 8.
- + 24/7 small retail centre (10-12 shops e.g. Grower market, Aldi, small Coles)
- + Residential with commercial at ground, retail at George Grey Place
- + Large scale retail subject to retail needs assessment and permitted land use
- + Incidental office development, not commercial office space in early stages

Issues include:

- + Western Power site is constraint and 132Kv power line requires 10m easement
- + Access and traffic on Joondalup Drive – development to complement peaks
- + Seeking rezoning as part of the structure plan
- + Walkability to the train station
- + Lot sizes inappropriate for large scale retail.
- + PTA access easement options/mix of uses with Joondalup Gate
- + Potential deck car park due to site levels.
- + Drainage easement- relocate to road reserve

3.4.9 LANDCORP

31 March 2015

Landcorp has no current plans for their Collier Pass site. A bridge is proposed to access the vacant site in the Quadrangle west of the rail and to be built either by LandCorp in the next year or site may be disposed with proponent to build bridge. The site has significant constraints. There is a 10 metre crossfall with ground levels dropping steeply east and overhead power lines run through the middle of the lot. The Quadrangle was developed with the intention of being used by smaller owner/occupier type development. The current market is driving larger lots, many people purchasing 2 lots to accommodate the one development.

Landcorp also owns the Wanneroo Wolves stadium site on the corner of Collier Pass and Joondalup Drive. Relocation of the stadium and the future of the site is yet to be confirmed. The site may be put to market with EOI and will most likely default to bulky goods. Higher intensity development on the Collier Pass site would be a favourable outcome.

3.4.10 CITY OF WANNEROO

30 March 2015

The City of Wanneroo see potential strategic connections between the 2 cities. There is noted disconnect between the industrial areas of Wangara and Neerabup that could be strengthened. Current COW planning initiatives include:

- + Strategic Transport Plan focused on main roads and connections to industrial areas
- + Sub-regional framework by 30 June 2015
- + Expansion of industrial land at Neerabup both light and heavy industrial
- + Additional 3000-4000 dwellings for Wanneroo City Centre
- + 30,000m² floor space in Wanneroo City Centre (secondary centre)

The regional cycling and shared path network doesn't capitalise on Joondalup train station, connect east- west or access destinations such as Ocean Reef Marina and Yellagonga Park.

Considerations for JAC include:

- + Enhance entertainment economy – particularly within walkable catchment of train station
- + Strategic employment and office space close to train station
- + More place making and spaces for/by youth
- + Increase residential density around Lakeside/Arena/ECU
- + Absence of town square or piazza
- + Signage strategy to enhance legibility for pedestrians i.e. '10 minute walk to...'

3.4.11 LENDLEASE- LAKESIDE SHOPPING CENTRE

The Joondalup Regional Shopping Centre (Lakeside Shopping Centre) is located in the core of JAC. Lakeside has undergone several expansions since original establishment in 1994. Lend Lease acquired the centre in 2010, and further expanded it in 2014 to incorporate the City's first full line Department Store, an enhanced interface with the Joondalup bus rail interchange, and an expanded CBD retail level incorporating a new food terrace, leading retailers & improvements to the Boas Avenue interface. Lakeside Joondalup has risen to prominence as one of the top twenty major regional centres nationally, and is currently the largest retail centre in Perth in both scale and total retail floorspace.

Lend Lease's long term aspirations for lakeside Joondalup are to:

- + Reinforce the role of the City of Joondalup as the leading destination in the north of Perth;
- + Enhance pedestrian and vehicular connectivity between Lakeside and the Joondalup CBD;
- + Incorporate key commercial, residential and hospitality sites;
- + Enhance linkages between the bus rail interchange and wider CCP; and
- + Lend Lease are currently updating the master plan framework which will guide further development application for the Centre as the city continues to grow.



04 VISION AND PRINCIPLES



4.1 Opportunities and Challenges

4.1.1 PLANNING AND POLICY

Former Western Australian Premier, Sir Charles Court, laid down his vision for the North West region of Perth in 1976 in which the JAC was intended to be a master planned regional centre to provide for an alternative economic, recreational and cultural focus to Perth's CBD. In the 1990 a Master Plan (Figure 17) for the City of Joondalup was completed by Hames Sharley and endorsed through the JDC. Planning responsibility for the JAC passed from the JDC to the City of Joondalup in 2003.

The 1990 Master Plan was largely premised on green field development and has been extensively delivered over the 25 years. Decisions regarding the city's development have generally occurred in accordance with the JDC Master Plan and it is still considered to be the preeminent development plan for the City. As a result of historical decisions made regarding the evolution of the City, a number of opportunities and challenges have emerged for the JAC.

Joondalup is identified in Directions 2031 and Beyond as a SMC, establishing the JAC as the preeminent centre for the North West Sub-region. SPP4.2 specifies the planning requirements for Joondalup as a SMC. Joondalup is already well progressed in meeting these requirements.

Joondalup has matured into a multi-dimensional city with an emerging personality and evolving sense of place. Planning and resultant development has not fully reflected the conceptual planning and design proposed for the city centre. **Figure 18** illustrates the JAC in its current form.

The JACP establishes a new framework that will guide future land use, movement patterns, building form and precinct character. The envisioned urban form for the JAC is outlined in **Section 7 - Urban Form**.



4.1.2 HOUSING AND DEMOGRAPHICS

Joondalup is the largest and most established centre in the north-west sub-region and in 2014, Profile .id estimated that the City had a residential population of 168,638 (increased from 152,406 at the 2011 census (ABS, 2011).

Directions 2031 estimates that the NWSR will reach a population of 395,000 by 2031 (growth of 39%) while the draft Perth and Peel@3.5million estimates that a population of 546,423 could be achieved by 2031. Despite the differing projections it is abundantly clear that the NWSR is growing and that the City and the JAC has an important role in facilitating this growth.

The City has maintained steady growth for a number of years with land availability and demand for coastal living and new homes providing the impetus for growth. In recent years much of this residential expansion has occurred in the suburbs of Burns Beach, Iluka and Kinross (and to a lesser extent Currambine and Hillarys). However, the City is set to experience a paradigm shift from green field to more intensive infill development around the JAC and station precincts. Current residential density is well below the minimum and desirable requirements (SPP 4.2) for SMC's.

The City's age profile is similar to Greater Perth. However, the age profile of JAC is vastly different with a much smaller percentage of 0-14 year olds and much higher percentage of 15-24 year olds. The housing options provided in JAC are better suited to smaller household sizes as opposed to families, this is reflected in the much higher percentage of 'Couples without Children' and 'Lone Person' households.

The JAC is intended to provide a holistic framework to govern this expected growth. It will help the City realise the potential of the JAC in meeting the housing demands of its population and catchment.

OPPORTUNITIES AND CHALLENGES:

- + Improve land use integration in JAC, by providing high density living options in close proximity to public transport, services and amenities.
- + Increase residential density within the JAC walkable catchments to meet SPP 4.2 density targets.
- + Diversify housing choice by providing affordable housing options for students and more 3 and 4 bedroom dwellings for families.
- + Increased residential density in JAC will provide patronage capacity for improved public transport and local area transit.
- + Establish Edgewater Station Precinct as a Transit Oriented Development.

4.1.3 ECONOMICS AND EMPLOYMENT

Increasing the employment self-sufficiency of the City is key to relieving challenges such as population growth and commuter traffic congestion. JAC services a regional population catchment of approx. 350,000 which is projected to increase to about 500,000 by 2050.

To achieve the outcomes of Directions 2031, employment self-sufficiency in the sub-region must increase from 41% to 60%.

OPPORTUNITIES AND CHALLENGES:

- + Employment diversity through attracting strategic, global and knowledge based employment will be a key driver for economic development. This can be achieved through promoting:
 - Infrastructure that is commensurate with a knowledge-based City
 - Promoting key development sites to attract strategic employers
 - Small business capacity building
 - An attractive and lively city centre and public realm
 - Enhance commercial activity in key economic precincts;
- + Co-location of health, education and recreation in an established city centre is unique and can be capitalised on by:
 - Strengthening collaboration between research and industry in key sectors.
 - Fostering and accommodating "jobs of the future".
 - The visitor and tourism economy has potential to be expanded through:
 - Arts and cultural activity (festivals, events, Joondalup Performing Arts Facility)
 - Strengthening and diversifying the retail, hospitality and leisure offering in the city
 - Enhancing the evening economy and destination experience in key visitor precincts
 - Improved connection to regional attractors including coastal destinations such as Hillarys Boat Harbour and Ocean Reef Marina.
 - Recognising and promoting key themes – nature, heritage and culture.



4.1.4 LAND USE AND URBAN FORM

The JAC is 488 ha in area which is comparable to Perth CBD at 483 ha. This provides capacity for the JAC to grow into Perth's second CBD.

Land availability for development and re-development together with an enabling planning framework will provide opportunity for employment and urban intensity. JAC has capacity to exceed a total commercial floorspace of 860,000m² in 20 years (approximately 2,000m² per hectare). This floor space can accommodate 45,000 employees at an intensity of about 3,600m² per hectare (average 34.9m² floor space per employee).

The JAC is dominated by the Lakeside Shopping Centre to the west of Grand Boulevard and a range of commercial buildings to the east and focused along Boas Avenue. While the location of the train station in the CCP is ideal it is surrounded by the shopping centre which restricts access, identity and integration into other parts of the JAC. The rail cutting has created a disconnect across the JAC both to the north and south of Joondalup Train Station.

Activation of streets in the JAC is low and retail is either internalised within Lakeside Shopping Centre or located outside the centre. This limits the evening economy and the overall liveability and community image of the city.

There is significant capacity for intensification due to the wide streets and low scale buildings that currently create a "country town" feel in Joondalup. This scale and the dominance of car based urban design currently limit the urban grain and intensity in Joondalup. The city is now ready to evolve into its next stage as the pioneering developments reach the end of their useful lives.

OPPORTUNITIES AND CHALLENGES:

- + Provide enabling policies that encourage activity, rather than a focus on design guidance;
- + Support intensification and consolidation of the CCP;
- + Plan and design primarily for pedestrians in the CCP;
- + Establish a city heart and vibrant sense of place outside of and complementing the retail centre;
- + Enhance Boas Avenue as the "main street" of Joondalup;
- + Increase activation of Grand Boulevard as the primary north- south city street;
- + Realise the vision for a green link through Collier Pass and Central Park and strengthen connections to Lake Joondalup;
- + Support improvements to east west connectivity over the rail cutting; and
- + Improve the arrival experience and legibility of the Joondalup train station.

4.1.5 MOVEMENT

The JAC has a high level of access to regional roads and high frequency public transport. JAC is situated adjacent to key north-south (Mitchell Freeway) and east-west (Ocean Reef/Gnangara Road) road corridors. Historically access and movement has been Perth-centric, evidenced by the strong north-south linkages and less legible east west links.

The Perth-Butler train line has train stations at Joondalup and Edgewater and Joondalup is serviced by numerous bus routes. The large land area of the JAC presents some access issues however the majority of the city is within an 800 metres walkable catchment of the train stations. The central location of the train station in JAC is a major benefit and differentiator between other major centres (e.g. Mandurah, Stirling and Midland). However, due to the configuration of the retail centre, pedestrian access and identity of the station as a key landmark element in the city is compromised as it hinders access and integration with surrounding precincts and key areas of the public realm (e.g. Central Walk).

OPPORTUNITIES AND CHALLENGES

- + Strengthen east-west transport network to provide strategic linkages to surrounding activity centres, the coast and future urban expansion areas such as East Wanneroo.
- + Capitalise on the strong public transport network to improve the integration of land uses and employment with the movement network.
- + Enhance the multi-modal connectivity to areas beyond the 800m catchment from key nodes.
- + Enhance cycling and walking for local trips throughout the JAC with good east – west links across the city.

4.1.6 LANDSCAPE AND ENVIRONMENT

JAC has a distinctive identity as a 'City in Landscape' which was originally articulated as 'the glistening' with reference to lake Joondalup. The scale of the City's urban environment and the presence of indigenous trees define the streetscape environment. Adding to this distinct identity, significant areas of open space and parkland flow through and frame the City, including Central Park, Lake Joondalup and Yellagonga Regional Park. These areas are a unique asset for an urban environment. The establishment of Yellagonga Regional Park has protected much of the natural environment and maintained the opportunity of an extraordinary recreational asset within easy walking distance of the JAC.

OPPORTUNITIES AND CHALLENGES:

- + Create a unique 'City in Landscape' identity;
- + Capitalise on the unique and regionally significant recreational assets located in close proximity to Joondalup's increasingly intense urban heart;
- + Improve connections to Lake Joondalup and Yellagonga Regional Park across JAC precincts and from the freeway shared path;
- + Implement functional, attractive and water- wise streetscape treatments in the featuring theme for the City which engage the community on water wise concepts;
- + Enhance the usability and attractiveness of urban spaces and open spaces within the JAC; and
- + Retain, maintain, rehabilitate and integrate existing natural bushland areas within the JAC.



Figure 17: Joondalup City Centre Master Plan (1990)

Source: Hames Sharley, 1990

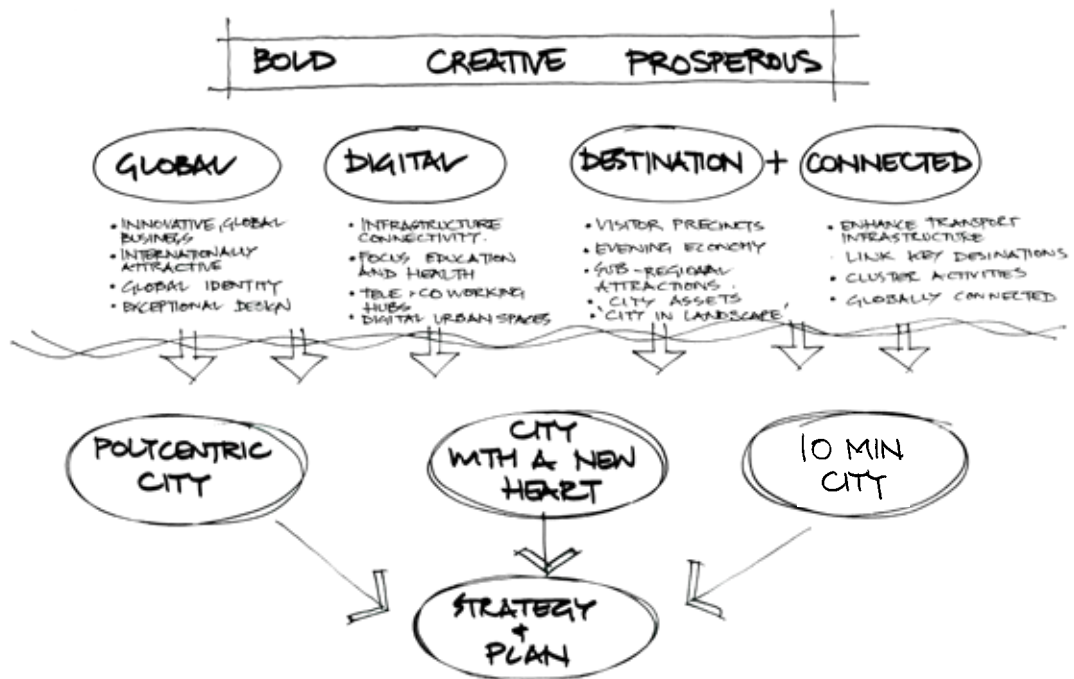


Figure 18: Joondalup Activity Centre Aerial Photograph 2016



4.2 Vision

As a bold, creative and prosperous city, Joondalup will be recognised through the quality of its urban environment. Elegant boulevards and squares will be the setting for a rich commercial and community life and buildings will demonstrate a strong commitment to good design and sustainability. The city will welcome visitors arriving by car, cycle and public transport and people will walk and cycle safely in the city's beautiful landscaped streets. Inner city residents and their families will mingle with those doing business, studying or simply enjoying the lively urban atmosphere. Joondalup will be a place of choice for a diversity of people who will bring energy, employment and cultural vibrancy to the city.



4.3 Principles

The following principles have been identified as the key drivers for future development of the JAC, they guided the preparation of the Master Plan, and include:

- + A City in Transition;
- + A Knowledge Based City;
- + A City in Landscape;
- + An Identity on Arrival;
- + A 10 Minute City;
- + A Vibrant City; and
- + A Beautiful City.

4.3.1 A CITY IN TRANSITION

Joondalup has developed extensively over the last 25 years. The JAC was established on strong urban design principles which formed the foundation of the JAC’s current urban form. However, over time development has deviated from the original planning and design intent.

The majority of the JAC has been developed, although there are opportunities for the CCP to continue growing in size and area. The new urban form will grow upward and extend outward across Joondalup Drive taking on a new scale of intensity as the city transitions from its current form. Greater density is required to position Joondalup for the next transition of its development lifecycle. The JAC has all the components to be a successful centre but it lacks integration and connectedness. As the JAC transitions, new development should leverage off the strong urban design principles that were established through Joondalup’s original master planning.

Joondalup 1990 - First 25 years

- Service employment - retail, small business
- Commuters / students
- Pre-digital

- 60kph road network - freeway access to Perth
- 20th century - car based 'park-at-door'
- Bus / train transfer station

- City in Landscape - "The Glistening"
- New development - single use buildings
- 2-5 storey buildings - design guidelines

Joondalup 2050 - Next transition

- Knowledge employment - Small Medium Enterprises & research partners
- Strategic employment - Government, big business headquarters
- Destination - experience, 24/7 life, entertainment
- Digital, mixed mode workstyle/lifestyle

- Regional access - "arrival" at Joondalup
- Streets connecting destinations and neighbourhoods
- Social and technological links
- Mixed modes - CAT, cycle, walk, consolidated parking

- Redevelopment, infill, mixed-use buildings
- No height limits - amenity, spaces between buildings
- City as a 'living room' in digital/global world

Intensity

Activity

Diversity

Movement

Self-sufficiency

Character

Maturity

1989



2003



Now



Figure 19: Joondalup City Centre Transition



4.3.2 A KNOWLEDGE BASED CITY

As a knowledge-based city, Joondalup needs to be interconnected and accessible by residents, workers and businesses locally as well nationally and globally. This transition into a 'destination city' will see workers and residents be attracted to the city based on the spectrum of opportunities and activities that the city offers. Focusing on the public realm as the cities 'living room' will establish place capital and provide a differentiator for Joondalup.

The following objectives are recommended before Joondalup can become a knowledge-based city and destination for knowledge based institutions and strategic employment:

4.3.2.1 A STRATEGIC EMPLOYMENT HUB FOR THE NORTH-WEST SUB-REGION

- + Professional employment opportunities are increased for population within the JAC catchment through attraction of government and industry knowledge partners.
- + The CCP transitions into an intense mixed use area focussed on Boas Avenue and Central Walk.
- + Joondalup Endowment Precinct to develop into a knowledge and innovation precinct to transition from education and learning to industry and knowledge-based commercial.
- + Links from Winton Road to the CCP are strengthened to encourage diversity of commercial development through the central Winton Road precinct.
- + Commercial development opportunities are established within the walkable catchment of Edgewater Train Station.

4.3.2.2 A DESTINATION FOR KNOWLEDGE

- + A knowledge hub that leverages off Joondalup's key land uses - agglomeration of learning, health, research and industry, strengthened by connectivity and place, enables cross fertilisation of knowledge and attracts a knowledge workforce and industry.
- + A digital activity layer integrates and connects with urban places to differentiate JAC as a digital city and provide opportunity for new business enterprises with new ways of working and interacting.
- + Joondalup Health Campus to grow into a tertiary hospital, providing services and research facilities for the regional catchment.
- + Expansion of ECU to engage with industry and the community including the edges of the Learning Campus along Joondalup Drive and Grand Boulevard, in the Endowment precinct and the MITA site.
- + North Metropolitan TAFE will physically connect and interface with the City.

4.3.3 A CITY IN LANDSCAPE

Lake Joondalup and its landscape setting is a defining feature of Joondalup and a differentiator to other activity centres in Perth which are situated in predominantly urban environments. There is a cluster of environmentally significant areas surrounding Lake Joondalup and within Yellagonga Regional Park. This presents an opportunity to create a prominent recreation and open space node around Lake Joondalup and Neil Hawkins Park, reconnecting the JAC with Lake Joondalup. This can be achieved through enhancing east-west walking and cycling landscape connections through the city in line with the original landscape intent for the city (**Figure 21**).

The key opportunities of developing a landscape identity for the JAC are:

- + Strengthened links to Lake Joondalup through enhanced east-west pedestrian and cycle routes that reconnect the JAC with Lake Joondalup;
- + Clearly articulated landscape identity through high quality public realm and streetscape treatments that provide variety, activity, interaction and comfort;
- + Edges and gateways reinforce the landscape identity of Joondalup and provide a visual welcoming to the City; and
- + Neil Hawkins Park is the primary focus of activity at Lake Joondalup.

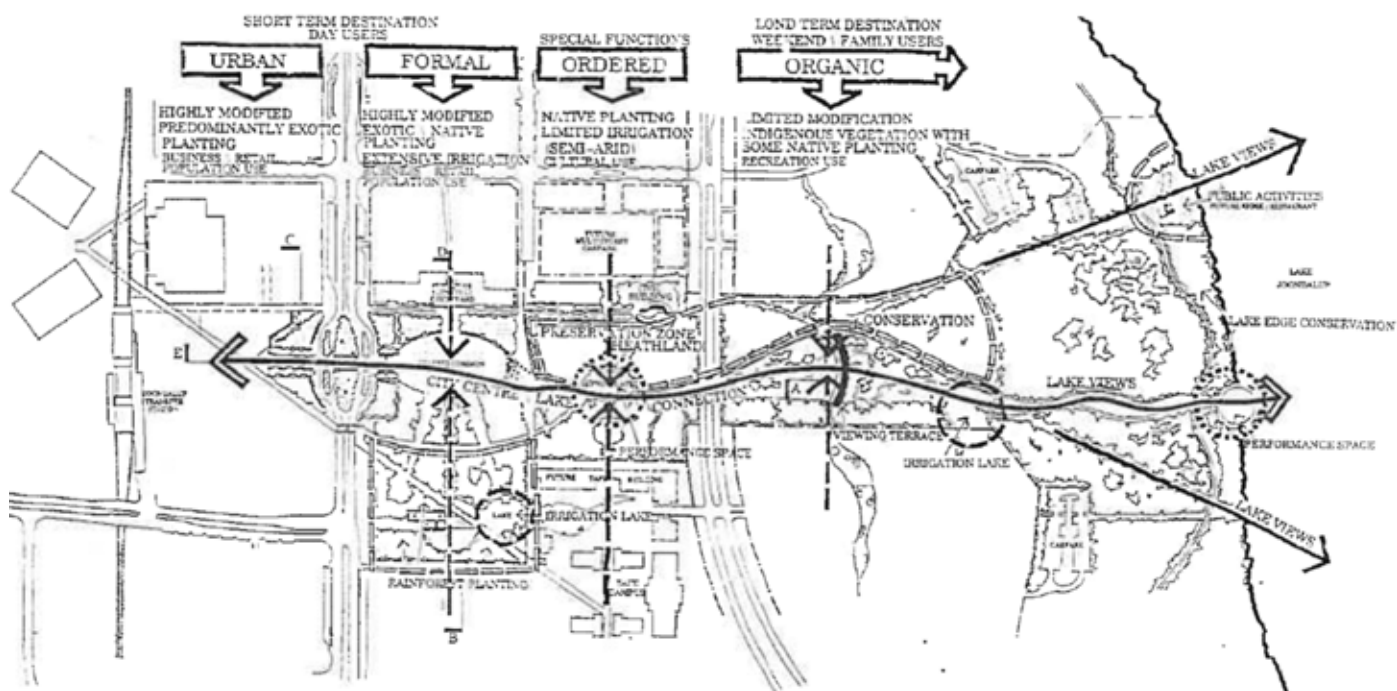


Figure 20: Original Landscape Intent



4.3.4 AN IDENTITY ON ARRIVAL

Ocean Reef Road and Hodges Drive are the recognised vehicle arrival points to Joondalup. Both roads have wide road reserves that provide access to Joondalup Drive and Grand Boulevard. As the NWSR continues to experience growth, travel to the JAC will increase the importance of Shenton Avenue (north west) and Burns Beach Road (north east) and establish the Shenton Avenue-Joondalup Drive intersection as the northern gateway and point of arrival.

Vehicle arrivals to the JAC can be enhanced by:

- + A consistent built form and landscape response that highlights Joondalup's identity and contributes to its sense of place.
- + A greater focus on traffic calming, changing driver behaviour to that appropriate of a city centre;
- + Creating a safer, more attractive pedestrian and cycle environment with greater capacity for increased pedestrian and cycle volumes; and
- + Existing road reserve widths to enable a local area transit service connecting key destinations and nodes throughout the city.

As transport to and through Joondalup shifts from being heavily car based toward an integrated approach it is expected that travel to the JAC by bus and train will increase. The arrival could be improved by:

- + Improve connections between the train and bus stations to the wider JAC;
- + Connections within the 800m and 400m walkable catchment of the train stations be more walkable with a focus on pedestrian priority. Particular emphasis should be given to safe and comfortable pedestrian routes to Joondalup and Edgewater Train Stations at all times; and
- + Opportunity for integration and connectivity with a future local area transit service that extends the existing CAT service to key destinations and nodes throughout the city.

The Principal Shared Path (PSP) provides access to the city for cyclists and pedestrians. Active transport arrival could be enhanced by:

- + Improved connections to the PSP;
- + Additional pedestrian crossings of the Freeway; and
- + Increased cycle parking and end of trip facilities.

4.3.5 A 10 MINUTE CITY

There is a capacity to shift modes used for short local trips (10 minutes). Currently, a high number of trips within 1km-5km of the JAC are made by car, however, majority of these trips are located within a 3km cyclable catchment (based on actual distance). The principal shared path (PSP) runs north-south along the Mitchell Freeway, but east-west connections are limited. The JAC is at a good cycling scale and the topography is generally flat, additionally, the wide road reserves in the city could enable separated cycle paths improving safety and mitigating potential vehicle conflict. There are opportunities to provide east-west links improving connectivity between the PSP and the CCP. There is currently a strong bias towards recreational cycling (along the coastline and around Lake Joondalup), however these is also a strong basis to encourage cycling for intra-city travel and commuting.

A key outcome of the JACP is to provide a framework that enables:

- + Joondalup residents and employees the opportunity to cycle and walk within the JAC along streets that are active, comfortable and safe places;
- + A legible and permeable JAC provides everything within a 10 minute cycle. End of trip facilities promote cycling as a primary form of mid-distance travel;
- + The JAC to develop around a planned and established transport network with high-quality transit stops and stations that are safe and attractive;
- + Wide road reserves are repurposed for local area transit and separated bicycle paths;
- + Car parking to be focused in key locations on the fringes and connected by high frequency public transport; and
- + Vehicle speeds to be limited and walking and cycling prioritised in the CCP, specifically along Joondalup Drive and Grand Boulevard.



4.3.6 A VIBRANT CITY - CITY SQUARES

The original Joondalup City Centre Master Plan illustrated a defined 'city heart' that provided a consistent inner city built form and link between Lake Joondalup and the Shopping Centre, however, as the JAC has grown and developed the 'city heart' was never fully realised. There is an opportunity to define a new 'city heart' or hearts.

To redefine the city as a place that offers identity, variety and activity, a network of city squares have been established. These squares are underpinned by 6 principles:

- + IDENTITY: Clear purpose and character
- + CONNECTED: Part of a 'place network'
- + ACTIVE: Edges and attractors
- + WELCOMING: Inclusive and comfortable
- + FLEXIBLE: Intimate and event scale, the City's "living room"
- + MANAGED: buildings and place partnerships

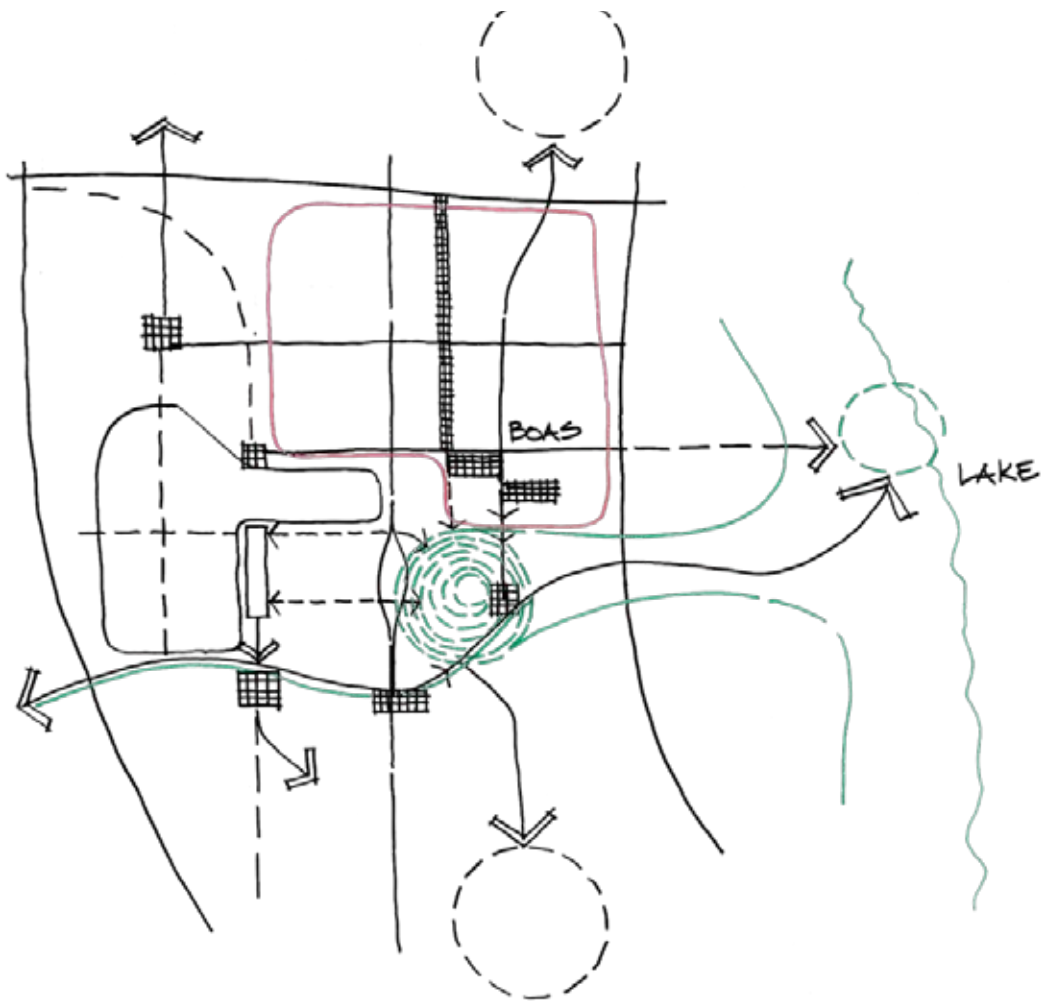


Figure 21: City Squares in the City Centre

4.3.7 A BEAUTIFUL CITY - DESIGN QUALITY

Joondalup has been developed thus far under comprehensive design guidance that has seen a cohesive approach to built form. The JAC provides guidance on desired built form standards, however, as the city grows it is recommended that:

- + Guidelines be reviewed to offer a more flexible approach that enables development rather than prescribes it.
- + The City continues to use its Design Reference Panel to assess development applications upon lodgement.

Cities are becoming more complex in their composition and operation. There is a need for a resilient urban form that is adaptable and responsive to change as Joondalup continues to grow. Change is occurring more rapidly than ever before, the ability to allow for and respond to rapid change will impact Joondalup's prosperity.

05 ACTIVITY

OBJECTIVES

- a) Establish significant knowledge intensive industry and employment, complemented by education.
- b) Facilitate land assembly and redevelopment that will further intensify development and activity in the city centre.
- c) Achieve a diverse mix of compatible uses that generate activity at all times of the day and night.
- d) Establish street based retail activity outside of Lakeside Shopping Centre within the city centre.
- e) Encourage increased activation of city centre streets and Central Walk.
- f) Facilitate high density residential development in the city centre and a diversity of housing to provide choice for residents.
- g) Encourage land uses that generate high concentrations of workers, residents and visitors to improve local employment self-sufficiency and self-containment.
- h) Focus travel, employment and user intensive activity around public transport stations and along movement corridors.

5.1 Context

In 2050, Perth will be home to 3.5 million residents. It is important to understand what role the JAC will play in supporting employment opportunities and providing a liveable and vibrant centre for people to live, work and play.

Population services have and will continue to be fundamental to the JAC's economic development. However, the opportunity exists to facilitate more diverse economic opportunities that take advantage of the JAC's comparative advantages and Perth's advantages in a world with over nine billion people, where global economic power has shifted, new unknown technologies exist and population ageing has altered community needs.

An Economic Development Plan was prepared by RPS, it seeks to optimise the JAC's comparative advantages in the education, health and retail sectors, its renowned innovation and research capabilities, its established public transport infrastructure and its location within the fast-growing NWSR to grow into a vibrant and diverse 'second CBD'.

5.1.1 ECONOMIC SIGNIFICANCE

The JAC is a major hub of economic activities and employment within Perth. It provides a significant array of local employment opportunities for residents across various industries. It is home to major institutions across the retail, health and education fields as well as a thriving small business sector which services customers across Perth and the globe and expanding government administration functions. It is home to large individual employers such as ECU, Joondalup Health Campus, Western Australian Police Academy, North Metropolitan TAFE and the City of Joondalup as well as a significant level of retail shopping options which cater to a regional catchment that spreads as far as Jurien Bay and Central Midlands (Wheatbelt) region.

The JAC has been at the centre of the rapidly expanding North West Corridor within Perth's fastest growth period in more than a century. Strategic investments undertaken over the past 45 years have enabled the centre to take advantage of these trends and grow into one of Perth's most important economic hubs and the highest employing strategic metropolitan centre in the state.

In less than two decades, the centre's employment has grown more than fourfold to approximately 17,025 jobs as of 2015 (across more than 1,000 businesses and organisations), with more than 7,000 jobs created over the last decade alone. The JAC's economy is estimated to contribute \$3.5 billion per annum to the wider regional economy¹.

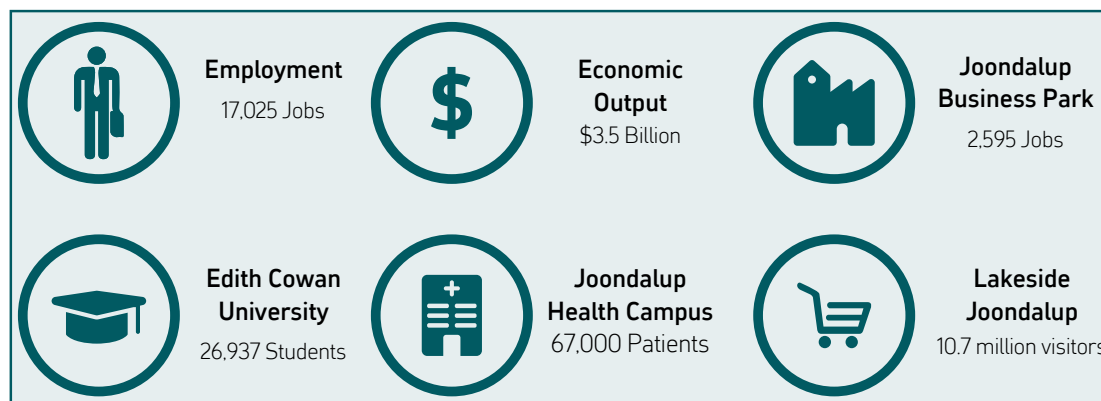


Figure 22: JAC Contribution to Economy, 2015

¹In order to understand the contribution of the centre to the regional economy, RPS has developed an estimate of the JAC's economic output based on employment estimates and industry standard floorspace revenue ratios (i.e. expenditure required to sustain businesses).



5.2 Existing Economic Profile

5.2.1 EMPLOYMENT TRENDS AND ATTRIBUTES

The JAC is a major hub of economic activity and employment within the NWSR. It provides a significant array of local employment opportunities for residents throughout the NWSR and complements the major industrial employment centres of Neerabup and Wangara, the numerous convenience retail centres and established inner ring employment hubs such as Perth CBD.

There were an estimated 17,025 jobs across more than 1,000 enterprises and organisations as of 2015². The bulk of employment was within the key economic pillars of retail/hospitality, health and education, though there were also notable levels of employment across manufacturing, population services and business services. The distribution of employment and floorspace is illustrated in **Table 8**.

Table 7: JAC Land Use and Employment Distribution, 2015³

Property Type	Square Metres	Employment
Shopping Centre	96,000	3,200
Specialties	30,000	1,000
Civic, Recreation and Entertainment	187,000	1,870
TAFE/University	111,000	2,220
Accommodation (rooms)	35	4
Fast Food/Restaurants	39,000	1,560
Commercial/Govt Building	87,000	3,480
Manufacturing	32,500	325
Storage/Distribution	39,300	171
Service Industry	37,300	414
Aged Care/Retirement	6,100	45
Allied Health	13,500	540
Hospital	36,000	600
Large Format / Bulky Goods	127,700	1,596
Total	842,400	17,025

The JAC has experienced substantial growth in employment over recent years in response to a number of key developments which have occurred. **Table 9** illustrates this growth in floorspace and employment since 1990.

Table 8: JAC Land Use and Employment Growth, 2015⁴

Year	Establishments	Square Metres	Employment
1990	42	41,727	1,684
1993	144	84,536	2,906
1997	450	209,768	3,821
2002	708	348,371	6,881
2008	996	518,752	10,721
2015	-	842,400	17,025

² Estimates by RPS Group, derived from the 2008 land use survey (Department of Planning) and development application data

³ Estimates by RPS Group, derived from the 2008 land use survey (Department of Planning) and development application data

⁴ Estimates by RPS Group and historical land use surveys (Department of Planning)

Whilst there is insufficient data to assess the characteristics of workers within the JAC, the ABS publishes information pertaining to the Joondalup–Edgewater region. This region incorporates the JAC and the predominantly residential areas north and south of the centre, with the area bound by Lake Joondalup, Burns Beach Road, Mitchell Freeway and Ocean Reef Road. This assessment therefore provides important insights about workers that have employment in the JAC given the lack of dedicated commercial areas outside of the structure plan area but within ABS defined Joondalup–Edgewater area.

The prominence of the key economic pillars has been illustrated by looking at the skew in employment. **Figure 23** below illustrates the industries which are prominent in the JAC, with a value greater than 1 implying the JAC’s workforce has a high representation and comparative advantage in that particular industry compared to Greater Perth as a whole, and vice versa.

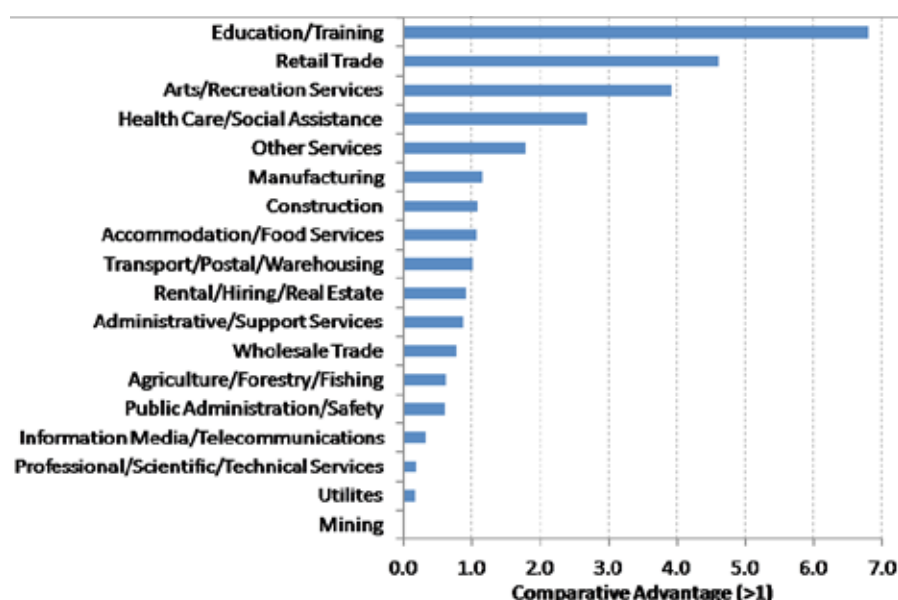


Figure 23: JAC Employment Shares Assessment, 2011

Source: ABS

In addition to the key pillars of retail, education and health, the analysis illustrates comparative advantages across arts and recreational services which is a reflection of the presence of HBF Arena and numerous recreational facilities within the Joondalup Business Park (e.g. ten pin bowls). However, total employment in this sector represents only 3.5% as of 2011. In contrast, the professional and technical services sector, which is a substantial employer in Perth CBD, represents a very low proportion of employment and reflects the lack of large professional services in the JAC. It also reflects the lack of offices by listed corporations which should be a focus for employment attraction.

More broadly, key employment characteristics have been assessed below.

- + **Government Employment:** The Joondalup–Edgewater region was home to equivalent levels of government employment as the Perth CBD (at 22.0%), though had higher levels of Commonwealth Government employment given the presence of ECU .
- + **Incomes:** Close to half of workers had incomes below \$42,000 compared to just 19.7% of workers in the Perth CBD and 36.0% of workers across Greater Perth. Low incomes were especially prominent in the retail and health care sectors. There were also low levels of high incomes, with only 6.3% of workers earning more than \$104,000 compared to 29.0% across Perth CBD and 16.3% across Greater Perth.



5.2.2 BUSINESS ATTRACTION AND RETENTION

With changing economic structures impacting current and future growth sectors, there is an impetus to ensure the JAC is an attractive destination for businesses, especially given increased competition from across Perth, the nation and globally.

An analysis of business registration trends within the Joondalup-Edgewater area has revealed that business levels have moderately declined in recent years. Between 2011 and 2015, the number of registered businesses in the area fell from 1,501 to 1,476, with the level of employing businesses declining to a less extent from 673 to 664 businesses. Like most non-CBD areas, changing business registration levels are largely influenced by sole traders which generally use residential registration addresses. The following table therefore only considers employing businesses registered in Joondalup-Edgewater.

Table 9: Joondalup-Edgewater Employing Business Levels, 2011-2015

Number of Employees	2011	2012	2013	2014	2015
1 to 4	420	395	366	399	408
5 to 19	199	206	207	198	204
20 or more	54	69	64	67	52
Total Employing Businesses	673	670	637	634	634

The area as of June 2015 had very low levels of larger employing businesses. There were only three registered businesses with workforces greater than 200 compared to 45 businesses in Perth city and 99 across Perth, with these large businesses all within the health and social services sector. There is therefore a significant opportunity for the JAC to place greater effort on attracting large businesses, especially head offices.

The following graph has been generated to illustrate the levels of competitive advantage in regards to business attraction by sector. This analysis reinforces the advantage the JAC has in the areas of education, health, public administration and retail. A notable area with few businesses relates to professional and financial/insurance services, especially larger businesses in these sectors.

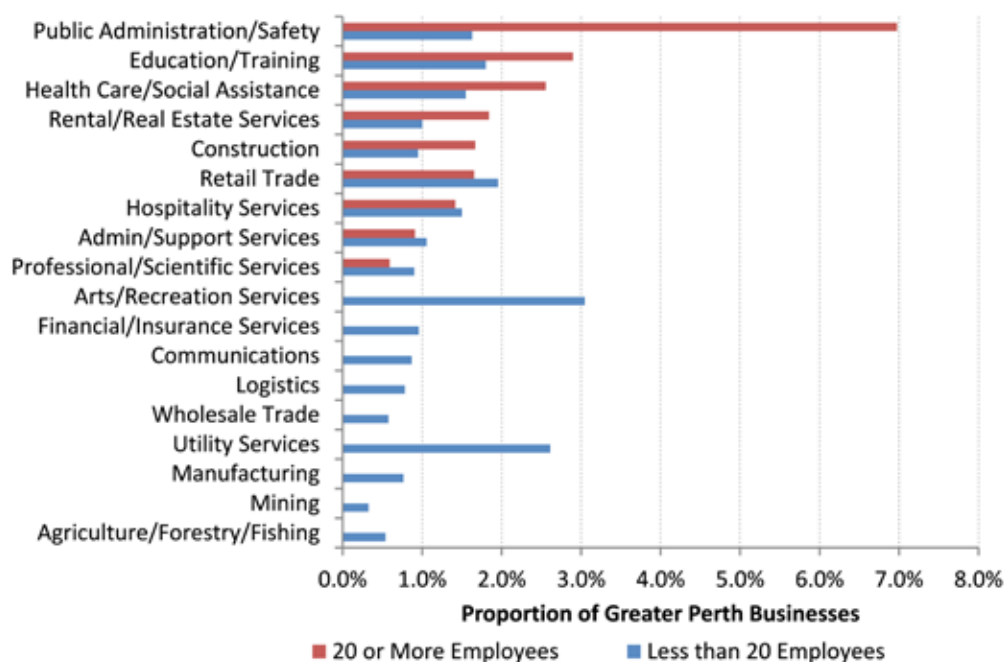


Figure 24: Share of Employing Businesses, Joondalup-Edgewater, June 2015

Source: ABS

In addition to above, the ABS has recently released figures detailing the employment characteristics of businesses that moved to or from the Joondalup-Edgewater area. This analysis differs from above as it is not influenced by the employment levels of businesses already registered in the area. Broadly, this analysis illustrates net losses in larger employing businesses over the period, but net gains in small employers (less than 5 employees).

Table 10: Business Entries and Exits, Joondalup-Edgewater, 2011-2014

Number of Employees	2011/12		2012/13		2013/14	
	Entries	Exits	Entries	Exits	Entries	Exits
1 to 4	55	43	46	42	70	31
5 to 19	9	11	3	9	15	11
20 or more	3	4	3	3	-	3
Total Employing Businesses	67	58	52	54	85	45

Comparing this analysis above has highlighted that a significant number of existing businesses have expanded in recent years. Over the 2011 to 2014 period, 17 businesses expanded into the 20 employee and above category.

5.2.3 KEY FINDINGS

Analysis of the economic profile has identified the following key characteristics of the JAC:

- + The JAC is the largest and most established centre in the NWSR and is therefore identified as a Strategic Metropolitan Centre within the State Government’s activity centres framework.
- + In less than two decades, the centre’s employment has grown more than fourfold to approximately 17,025 jobs as of 2015 (across more than 1,000 businesses and organisations), with more than 7,000 jobs created over the last decade alone, and the city centre’s economy has grown to an estimated \$3.5 billion per annum.
- + The bulk of employment is within the key economic pillars of retail/hospitality, health and education, however, there were also notable levels of employment across manufacturing, population services and business services.
- + The JAC also has comparative advantages across arts and recreational services which is a reflection of the presence of HBF Arena and numerous recreational facilities within the Joondalup Business Park.
- + The professional and technical services sector, which is a substantial employer in Perth CBD, represents a very low proportion of employment and reflects the lack of large professional services in the JAC. It also reflects the lack of offices by listed corporations which should be a focus for employment attraction. This trend has continued despite growing office accommodation in recent years, though it was recognised that much of the office accommodation is ancillary to mixed use developments and workshops, with few large floorplates available.



5.3 Existing Land Uses

5.3.1 EXISTING LAND USES

The key land uses identified within JAC are identified below:

5.3.1.1 CIVIC

The civic precinct is bounded by Grand Boulevard (west), Boas Avenue (north), Lakeside Drive (east) and Central Park (south). The precinct is comprised by the City of Joondalup administrative offices and Council Chambers, Joondalup Public Library, Joondalup Reception Centre and Joondalup Lotteries House. The car park has been identified as a future development area.

5.3.1.2 RETAIL

Lakeside Joondalup opened in late 1994 and has undergone numerous redevelopments, including in 2014, transforming the centre into WA's largest shopping centre – attracting 11.4 million customers and turnover of over \$711 million (March 2017). The centre's viability was supported by key transport investments including extension of Mitchell Freeway which was undertaken with support from the WA State Government, the City of Joondalup, the JDC and property owners to stimulate development. The shopping centre is the primary attractor and trip generator in the JAC. It provides access to the Joondalup Train and Bus Stations, however, it also acts as a barrier hindering pedestrian accessibility to other precincts within the JAC.

Boas Avenue is the focal point for small-scale retail and specialty stores outside of the shopping centre. There are also a number of large format retailers (e.g. Bunnings, Harvey Norman, and Good Guys). These facilities service the surrounding catchment and are complementary to Lakeside Shopping Centre.

5.3.1.3 COMMERCIAL OFFICE

In 2007, there was approximately 74,000m² of commercial office floorspace in JAC, this has increased to approximately 87,000m² in 2015 providing an estimated 3,480 jobs. Floorspace is dispersed across JAC, with the highest concentration in Joondalup Learning Precinct (including training facilities in The Quadrangle) of approximately 36,000m². The CCP core has approximately 25,000m² of commercial floorspace across ancillary commercial units and stand-alone commercial developments (e.g. Shenton House). A large proportion of ancillary office development is also within the recreation, education and health precincts, as well as Joondalup Business Park. The Quadrangle has experienced a moderate increase in workshop office developments in recent years.

Knowledge based industries are expected to grow with a particular focus on research, education and health. These industries will require increased commercial office floorspace and it is important that the JACP facilitates this growth.

5.3.1.4 EDUCATION AND LEARNING

The prominence of tertiary education facilities in JAC is a significant factor in providing long-term job growth for the City. The Joondalup Learning Precinct is comprised by ECU, WA Police Academy and the North Metropolitan TAFE southern campus. The recent establishment of the Automotive Institute of Technology (formerly MITA) and the Electrical College of Australia, further contributes to the learning facilities provided in JAC. North Metropolitan TAFE also has a northern campus, situated on Shenton Avenue.

Lake Joondalup Baptist College a coeducational K-12 school is located in the northern portion of JAC at the corner of Shenton Avenue and Joondalup Drive.

5.3.1.5 HEALTH

JHC services one of the fastest growing regions of Australia and is expected to remain the only regional hospital in the corridor until the establishment of Yanchep from 2030 onwards. This agglomeration of health land uses has formed since the inception of the original Wanneroo Hospital in 1980, and occupies a significant portion of land on the north east corner of Shenton Avenue and Grand Boulevard. JHC employs more than 2,700 people and in 2013/14 had over 60,000 hospital admissions (public and private combined) and 90,000 emergency department presentations and has a vision to become a Tertiary Hospital in the future.

Since 2009 redevelopment delivered a number of new facilities including:

- + Expanded Mental Health Unit with 42 beds included 10 secure beds.
- + Expanded Special Care Nursery.
- + New Emergency Department.
- + Wanneroo Wing (L Block) with 85 additional beds.
- + 12 new operating theatre.
- + Expanded Critical Care Unit.
- + Cardiovascular catheter laboratory.
- + Specialist Medical Centre.
- + Antenatal Clinic and After Hours GP Clinic.
- + 12 chair renal unit.
- + 37 bed Telethon Paediatric ward.

Sources: JHC Annual Report 2014, JHC Annual Report 2016, WA Health

An increasing (and ageing) population will result in increased demand for regional health facilities. The recent expansion of JHC, demonstrates that significant opportunities exist to better utilise existing health facilities, reducing the need to construct new regional facilities. Construction of a new 10 bed Mental Health observation area is underway and future expansions will positively contribute to the City's economy, generating strategic employment opportunities and subsequently employment self-sufficiency and self-containment.

Complementing the health services at JHC, JAC is home to aged care services (Belrose Grandview & Brightwater Oxford Gardens).

5.3.1.6 SERVICE INDUSTRY

The land surrounding Winton Road (west of Joondalup Drive, north of Hodges Drive, east of Mitchell Freeway, south of Shenton Avenue) provides the largest area of 'Service Industrial' zoned land within the City and is known as Joondalup Business Park. The park has evolved over the last 30 years, growing from 28 businesses employing 287 persons to 355 businesses employing 1,832 persons (2008). Employment is estimated to have increased to 2,595 jobs as of 2015. Whilst much of the growth has been driven by the expanding catchment population supporting the expansion of retail and wholesale businesses, there are a large number of businesses which service customers across Perth, the nation and internationally, including businesses which were some of the first to establish in the business park in the early 1990s.



5.3.1.7 RESIDENTIAL DENSITY AND DWELLINGS

Refer to Section 5.5 Population and Dwellings.

5.3.1.8 SPORT AND RECREATION

HBF Arena (formerly known as Arena Joondalup) is the primary sporting and entertainment venue in the north-west corridor. Situated to the north of the JAC, the arena is the home ground of WAFL team the West Perth Falcons. The venue also regularly hosts large music festivals which have on occasions attracted more than 40,000 patrons (VenuesWest). The facility gym has over 80 fitness, cycling and aqua classes available and access to an Olympic indoor 10 lane 50m pool with over 600 permanent seats. There is also an indoor 3 lane 25m pool, 400m² leisure pool, toddlers splash pool and other water features (including a 42m enclosed water slide) for community use. The area surrounding HBF Arena comprises a number of sporting fields including rugby, hockey, netball and tennis, there is also an indoor netball and basketball facility.

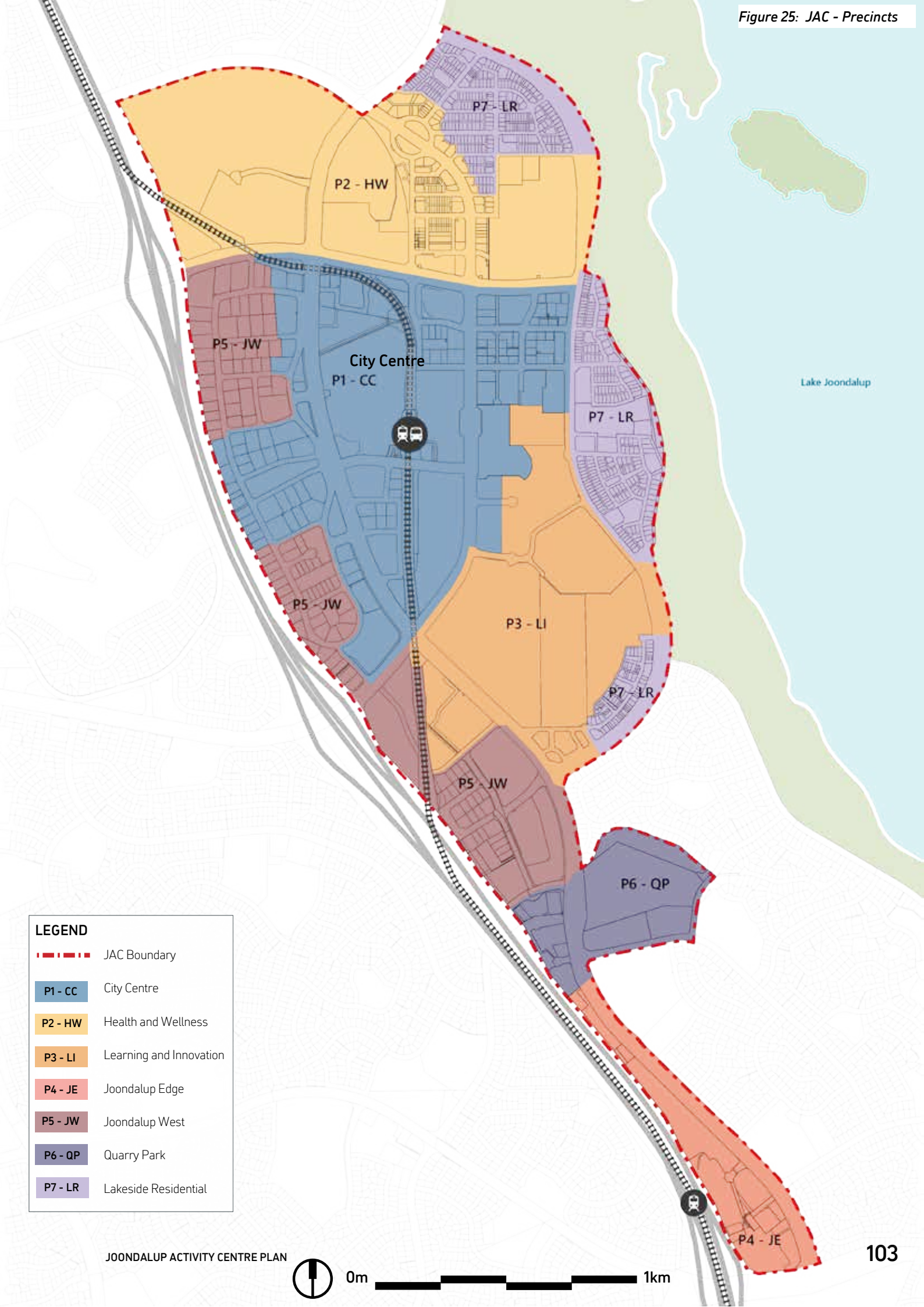
5.3.1.9

JAC is a highly urbanised area and open space is limited throughout the central core and industrial areas. The three main parks are situated in the east of JAC. Central Park forms part of an important pedestrian link between Joondalup Civic Precinct and the Learning Precinct. Opportunities exist to improve connectivity and integration between the precincts. Central Park is also the location of the Central Park War Memorial where the 2015 Anzac Day Centenary Dawn Service was held. Other parks in JAC include Elcar Park and Regent Park. Neil Hawkins Park is situated outside JAC on Lake Joondalup foreshore at Yellagonga Regional Park. Yellagonga Regional Park and Lake Joondalup are key differentiators between JAC and other metropolitan SMCs. Joondalup is the only SMC situated adjacent to a regionally significant open space network. Despite this, JAC does not interact with Lake Joondalup which is disconnected from the central core, particularly for pedestrians.

5.3.2 LAND USE PRECINCTS

Analysis of land use within the JAC has identified a number of land use agglomerations. This has resulted in the definition of seven precincts within the JAC. These precincts are outlined in Part One and have been used to guide land use and development.

These precincts are identified on **Figure 25** and **Table 12** outlines the key characteristics of the precincts:



LEGEND

- JAC Boundary
- P1 - CC City Centre
- P2 - HW Health and Wellness
- P3 - LI Learning and Innovation
- P4 - JE Joondalup Edge
- P5 - JW Joondalup West
- P6 - QP Quarry Park
- P7 - LR Lakeside Residential





Table 11: Precinct Land Use Overview

Precinct	Description	Key Components
City Centre	<p>The CCP is defined by the traditional core of the JAC which evolved from the development of the Wanneroo Council offices then subsequently Lakeside Joondalup, Joondalup Train Station, Joondalup Police Station and Courthouse and numerous retail tenancies between Boas Avenue and Reid Promenade.</p> <p>Through this period of growth in recent decades, the CCP experienced growth in mixed use residential developments which supported population growth of more than 500 persons between 2001 and 2007. Many of these developments are two to four storeys with ground floor commercial floorspace.</p> <p>Given the proximity of the Joondalup Train Station to the Joondalup Business Park, a portion of this area has been proposed to form part of the CCP. This area is currently home to large format retail outlets, wholesalers and small-scale office developments.</p> <p>The CCP functions as the entertainment hub, with a substantial array of retail and dining options across the area. It is also the economic heart of the centre and home to an estimated 7,500 jobs, including more than 1,000 office-based jobs. Given its prominence as the urban heart, it has been the focus of the next phase of development, with numerous large-scale office and residential developments proposed.</p>	<ul style="list-style-type: none"> + City of Joondalup offices and library + Joondalup Police Station & Joondalup Courthouse + Lakeside Joondalup + Central Park + ECU Endowment Precinct + Shenton House + Joondalup Train Station
Health & Wellness	<p>The Health and Wellness Precinct brings together HBF Arena, the North Metropolitan TAFE's Health and Wellness Training Campus and the Joondalup Health Campus. It also captures the 8.4 hectare Department of Housing undeveloped site, the Lake Joondalup Baptist College and numerous allied health businesses along Grand Boulevard. The area is also home to several apartment and unit developments and townhouses which accommodated an estimated 644 residents as of 2015.</p> <p>The area has experienced considerable growth in recent years as a result of the expanding Joondalup Health Campus and smaller scale expansions within HBF Arena, with the precinct home to just under 2,500 jobs as of 2015.</p>	<ul style="list-style-type: none"> + Joondalup Health Campus + Brightwater Aged Care + Lake Joondalup Baptist College + HBF Arena + Health and Wellness Training Campus (North Metropolitan TAFE)
Learning & Innovation	<p>The Learning and Innovation Precinct has been defined by the existing Joondalup Learning Precinct and the northern portion of 'The Quadrangle' development. The established training facilities in this section of The Quadrangle (such as the College of Electrical Training Inc.) and recently purchased Automotive Institute of Technology building to ECU's expanding research and training needs have helped to expand this precinct in recent years. The undeveloped western portion of the precinct is however constrained by the rail infrastructure.</p> <p>The precinct also includes the residential areas to the western side of Lakeside Drive and student accommodation within the ECU campus, with the area home to an estimated 680 residents in 2015.</p>	<ul style="list-style-type: none"> + ECU + Western Australia Police Academy + North Metropolitan TAFE (Main Campus) + College of Electrical Training

Precinct	Description	Key Components
Joondalup Edge	Joondalup Edge is defined by the large format retail area bound by Joondalup Drive, Ocean Reef Road and Mitchell Freeway. The area has been defined as a transit-orientated development however it currently functions as a commercial centre and is home to the new multistorey park and ride facility. The site is constrained by Western Power infrastructure, though convenient access to rail infrastructure and urban amenity supports a mixture of commercial and residential uses.	<ul style="list-style-type: none"> + Joondalup Gate + Western Power Sub-Station + Edgewater Train Station
Joondalup West	Joondalup West is defined by two commercial areas: the remaining portions of the Joondalup Business Park and The Quadrangle. The precinct is the most diverse, with employment across manufacturing, recreation, service commercial, technology and business services, storage/ wholesaling and large format retail.	<ul style="list-style-type: none"> + Bunnings Warehouse + Masters + PTA Bus Depot
Quarry Park	Quarry Park has been defined by the 9.7 hectare undeveloped Edgewater Quarry site and the existing large format retail west of Joondalup Drive (e.g. Gateway Joondalup). Eddystone Avenue provides access through the precinct from the established Heathridge and Beldon urban areas. Whilst there are currently no residential developments in the precinct, the surrounding area is of a residential nature and it also adjacent to Mater Dei College and Edgewater Primary School. Whilst much of the employment is of a retail nature, the area is home to GP and allied health uses given its convenient access off Joondalup Drive.	<ul style="list-style-type: none"> + Gateway Joondalup + Edgewater Quarry + Joondalup Drive Medical Centre
Lakeside Residential	<p>The Lakeside Residential Precinct is comprise by the existing residential areas located on the periphery of the JAC. As the JAC intensifies the Lakeside Residential Precinct will contribute to dwelling diversity by providing detached and semi-detached dwellings.</p> <p>The precinct abuts Yellagonga Regional Park providing a transition between the intense CCP and Lake Joondalup.</p>	



5.4 Future Land Use and Employment

The JAC is well-positioned, from historical and growth outlook perspectives, to transform into a second CBD which caters to Perth’s growing northern suburbs. Guiding this evolution into a ‘primary centre’ is the identification of a set of land use projections which have informed the structure planning process. A rigorous bottom-up and top-down approach to future population and employment forecasts has been undertaken. The combination of these approaches enables the identification of aspiration but achievable targets for development within the JAC.

Guiding these projections is the State Government’s Perth and Peel@3.5million strategy which plans for a city of 3.5 million residents by 2050. Whilst this growth is considerably less than levels experienced over the past decade and the previous 35 years, it represents a substantial transformation of the city’s urban areas over the coming decades and places increasing pressure on leveraging employment opportunities within the JAC.

Central to the future growth outlook is the role of the North West Corridor. The numbers of residents and workers are expected to double in the corridor to 740,300 and 376,000 respectively.

5.4.1 GROWTH SCENARIOS

Three distinct growth scenarios were tested for the JAC based on State Government projections and policy targets identified by previous research undertaken for the City of Joondalup. In combination with analysis undertaken as part of the economic study undertaken by RPS, the following scenarios have been identified:

- + **Scenario One – Sub-Regional Framework:** Growth is limited and trends in line with the targets identified in the North West Corridor’s draft Sub-Regional Framework;
- + **Scenario Two – Moderate Growth:** The JAC experiences slower growth than historical averages, with established and emerging centres and industrial areas capturing a greater share of future employment; and
- + **Scenario Three – Primary Centre:** Both employment and population growth will slow moderately from historical averages in response to slower population growth in the corridor, but growth will still be substantial as the centre will grow to be home to 45,000 jobs and more than 19,000 residents (in line with the Joondalup Centres Strategy and Local Housing Strategy).

The key population and jobs targets for each scenario have been summarised in **Table 13**:

Table 12: JAC Employment and Population Scenarios

Scenario	Jobs			Population		
	2021	2031	2050	2021	2031	2050
Scenario One	N/A	17,446	20,181	5,308	6,716	10,500
Scenario Two	18,550	21,980	32,600	5,540	7,480	13,350
Scenario Three	20,087	26,528	45,000	6,750	11,894	19,845

Scenario Three has been selected as the preferred scenario to guide the JACP. A key deciding factor was consideration of the historical growth patterns experienced over recent decades and the comparative advantages the JAC possesses.

The JACP establishes an aspiration and achievable population target of 19,845 residents and 45,000 jobs by 2050.

Figure 26 provides an illustration of the Scenario Three targets compared against the historical and target numbers for competing centres in addition to interstate comparisons. It was found that employment targets for the medium term are slightly higher than those estimated at benchmark centres such as Chatswood which experienced considerable commercial property development over a ten year period in the 1990s. By 2050, employment is expected to increase close to that observed within Sydney’s second CBD Parramatta. Of note, the population targets for the JAC are below the ambitions of the Canning and Stirling centres.

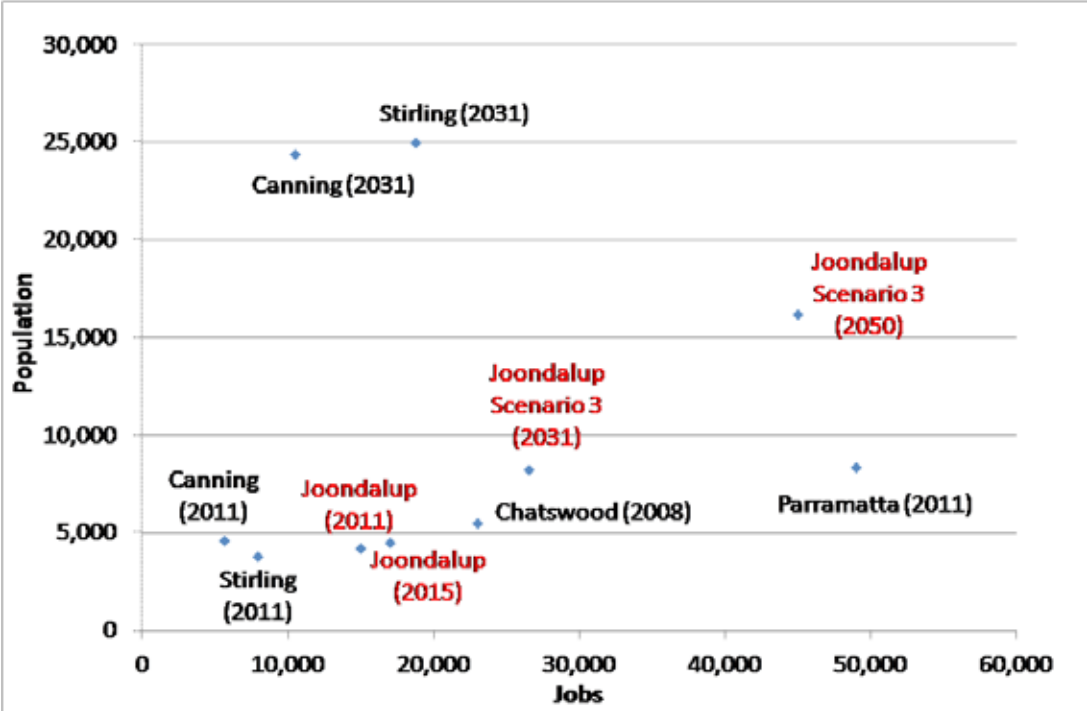


Figure 26: Residential Population and Job Estimates, Benchmark Centres



5.4.2 LAND USE ASSUMPTIONS

Table 14 outlines assumptions in order to achieve Scenario Three employment and population targets.

Table 13: Land Use Growth Scenario Assumptions

Land Use	Assumptions
Retail	<p>Lakeside Joondalup is assumed to remain a significant and growing shopping centre over coming decades, with this outlook confirmed by expansion plans. A moderate increase in specialty retail elsewhere in the CCP is anticipated with the most significant increase related to dining, bars and take-away food, supported by a greater local population. Growth in shop retail floorspace is assumed to be relatively moderate, and well below regional requirements (63% compared to more than 200%).</p> <p>Large format retail is assumed to decline marginally over coming decades as established large format retail precincts redevelop into higher order uses, especially in areas such as Joondalup Edge near Edgewater Train Station, with these areas identified through the Local Commercial Strategy (LCS) as ideal for mixed use commercial uses. The 100,000m² target is in line with the LCS, with much expected to be accommodated in Joondalup West Precinct.</p>
Office/Business	<p>Growth in commercial office floorspace is expected to be the most substantial change to the centre over coming decades, with growth in research, technology development, population-based business and professional and technical services expected to translate into substantial need for commercial floorspace across Perth in coming decades.</p> <p>The LCS recommends substantial growth in commercial office floorspace to 200,000m² over the next two decades. This scenario has assumed slower growth from 2035, in line with the State Government's population outlook. The vast majority of office space is expected to be located in the CCP complemented by ancillary and small-scale dedicated office space within other precincts.</p>
Education/ Research	<p>Tertiary and technical education floorspace is expected to approximately double over the next 35 years in response to increasing student numbers and research and training requirements. Much of this growth in the short to medium term is expected to be driven by ECU which has land available to continue to expand into a denser university campus. There is potential for growth at Lake Joondalup Baptist College which has not been assumed.</p>
Health	<p>The JAC is expected to capture much of the future health need within the North West Corridor until facilities are developed within Yanchep City Centre. This is reflected in land use projections, with the JHC expected to remain a key regional facility and continue to expand in line with population growth and increasing health facility needs. JHC is projected to be supported by a substantial quadrupling of allied health and social services, as well as a growth in aged care and retirement living services.</p>
Entertainment, Recreation & Culture	<p>The Health and Wellness Precinct is expected to experience growth in recreation services over coming decades as HBF Arena expands in line with population needs. Meanwhile, demand for entertainment and cultural space is expected to support a moderate increase in floorspace within the CCP.</p>
Residential	<p>In determining population and dwelling targets the following assumptions are made:</p> <ul style="list-style-type: none"> + The CCP will be the primary focus for high-density residential. + Almost half the residential population will live within 800m walk of Joondalup and Edgewater Train Stations. + The Department of Housing site will be developed as a mixed-use precinct. + There are aged care/retirement opportunities in the Health and Wellness Precinct. + ECU will continue to develop student housing within its campus. + Portions of Edgewater Quarry will be developed for residential. + Residential development will not be permitted in Joondalup West Precinct and is not encouraged within the Arena site. + Existing character in Lakeside Residential precinct will be preserved.

5.4.3 PRECINCT GROWTH TARGETS

5.4.3.1 JAC MODELLING RESULTS

In order to meet the 45,000 job target, commercial office, health and education related floorspace would have to increase at a much faster rate than the wider population growth would suggest, with total floorspace modelled to double over the next 35 years. This implies that the JAC will have to increase specialisation and take advantage of the growth potential within the wider Perth, and across the nation and the globe.

At the same time, given demographic and economic trends, both microeconomic and macroeconomic, it is expected that some sectors in the JAC will grow while others decline and shift operations to more affordable locations or locations co-located with faster growing populations. This trend has been reflected in the projections, with service industry, storage/distribution and large scale manufacturing employment declining over the coming 35 years.

Table 14: JAC Estimated and Potential Indicators

Land Use	2015		2050	
	SQM	Jobs	SQM	Jobs
Manufacturing/Processing/ Fabrication	32,500	325	12,000	120
Storage/Distribution	39,300	171	14,000	61
Service Industry	37,300	414	13,500	150
Shop/Retail	165,000	5,760	269,700	9,570
Office/Business	87,000	3,480	425,000	17,000
Health/Welfare/Community	166,000	3,405	468,400	13,578
Entertainment/Recreation/Culture	187,000	1,870	325,400	3,254
Large Format/Bulky Goods	127,700	1,596	100,000	1,250
Accommodation (rooms)	35	4	170	17
Total Employing Businesses	842,400	17,025	1,628,000	45,000

5.4.4 PRECINCT TARGETS

In order to inform the implementation of the JACP, **Table 16** allocates the employment and population targets across the seven JAC precincts.

Table 15: JAC Employment and Floorspace Precinct Targets, Scenario Three

Employment Floorspace & Jobs	2015		2050	
	SQM	Jobs	SQM	Jobs
City Centre	282,010	7,587	651,600	21,460
Health and Wellness	108,125	2,438	364,350	11,160
Learning and Innovation	121,500	3,257	270,940	6,785
Joondalup Edge	50,000	625	39,800	1,515
Joondalup West	250,000	2,638	295,580	3,845
Quarry Park	30,800	481	5,900	235
Lakeside Residential	N/A	N/A	N/A	N/A
Total Employing Businesses	842,435	17,025	1,628,170	45,000



5.4.5 REGIONAL EMPLOYMENT CONTRIBUTION

5.4.5.1 REGIONAL EMPLOYMENT PROJECTIONS

One of the primary concerns of the draft Perth and Peel@3.5 million planning document is to more closely align the spatial location of people’s place of residence and place of work by ensuring employment opportunities are made available close to residential areas. The rationale behind this is that by increasing employment self-sufficiency (the ratio of jobs to workers in a location), there will be less pressure on transport networks and reduced travel time social and economic costs.

The draft North West Sub-Regional Framework has included projections of employment and workforce levels based on existing patterns and population projections. These same population projections have informed the previous scenarios.

The table below illustrates that the North West Corridor currently has a low employment self-sufficiency rate. The State Government expects this to moderately improve over the coming decades.

Table 16: North West Corridor Employment Projections

	2011	2021	2031	2050
Population	322,486	429,954	546,423	740,319
Labour Force	163,636	211,087	268,331	376,386
Jobs	80,566	126,014	174,201	229,089
Employment Self-Sufficiency	49.2%	59.7%	64.9%	60.9%

Underpinning the above projections is an estimate of employment within the JAC over the coming decades. This business as usual scenario is considered significantly conservative, with the JAC only expected to be home to 20,181 jobs by 2050 compared to an estimated 17,025 employees in 2016.

5.4.5.2 PROJECTED EMPLOYMENT-SELF SUFFICIENCY CONTRIBUTION

The JAC is a major employer in the North West Corridor and is expected to continue to play a key role in providing local employment opportunities over the coming decades. Based on the preferred employment scenario (Scenario Three) noted above, the JAC is expected to accommodate an increasing proportion of the local workforce, with its share of the local workforce increasing to approximately one in eight workers by 2050.

Table 17: Contribution to Corridor Employment

	2011	2021	2031	2050
Labour Force in North West Corridor	163,636	211,087	268,331	376,386
Jobs in JAC	≈14,000	20,588	26,528	45,000
Proportion of Corridor Labour Force	8.6%	9.8%	9.9%	12.0%
JAC Employment Self-Sufficiency	667%	656%	446%	454%

5.5 Population and Dwellings

In 2015 the JAC had approximately 4,419 residents and 2,036 dwellings (at an average of 2.14 persons per dwelling). Residential development was largely absent from the JAC until the late 1990s. The first stages of development were north of Shenton Avenue. Development within the area bound by Grand Boulevard, Regents Park Road, Lakeside Drive and Joondalup Drive expanded from 1996 to 2001. Development sought to increase residential density in the region through the creation of lots of 350 to 450m². Residential development expanded east of Lakeside Drive between 2000 and 2006. This area has subsequently grown to an estimated 1,044 residents in 2015. This area complemented development south of ECU (north of Lakeside Drive) which developed between 2003 to 2007 to house 707 residents as of 2015, including student housing.

Medium density housing increased within the JAC from the mid-1990s onwards. Two and three storey walk-up apartments helped increase the JAC's population from 1,500 residents in 2001 to 4,000 residents by 2010. This included several larger developments on Grand Boulevard such as a 58-unit development in 2002 (101 Grand Boulevard) and 61-unit development in 2005 (165 Grand Boulevard). These were complemented by numerous smaller scale developments along Reid Promenade, Davidson Terrace and Walsh Loop.

The JAC is now poised for another growth phase as the focus shifts to high density development. Numerous developments are proposed over the next few years, with plans progressing for development up to 18 storeys set to transform Joondalup into a vibrant JAC and help meet the growing needs of the expanding North West Corridor.

5.5.1 PRECINCT TARGETS

Table 19 provides an overview of the population and dwelling targets for each precinct in the JAC.

Table 18: JAC Population and Dwellings Precinct Targets, Scenario Three

Population & Dwellings	2021		2031		2050	
	Population	Dwellings	Population	Dwellings	Population	Dwellings
City Centre	1,553	665	2,498	1,151	7,938	3,658
Health and Wellness	1,789	767	5,114	2,357	5,457	2,515
Learning and Innovation	473	203	595	274	992	457
Joondalup Edge	-	-	416	192	1,885	869
Quarry Park	-	-	238	110	397	183
Lakeside Residential	2,936	1,258	3,033	1,398	3,175	1,463
Joondalup West	-	-	-	-	-	-
Total	6,750	2,893	11,894	5,481	19,845	9,145



5.5.2 RESIDENTIAL DENSITY

SPP 4.2 encourages higher density residential development within the 800m walkable catchment of an activity centre. The minimum density required for a strategic metropolitan centre is 30 dwellings per gross hectare whilst the desirable density is 45 dwellings per gross hectare. The JAC has two walkable catchments, around the Joondalup and Edgewater Train Stations. The area of the walkable catchments within the JAC is outlined in **Table 20**:

Table 19: JAC Walkable Catchments

Catchment and Reserves	Area
Joondalup Train Station	201.4ha
Edgewater Train Station	23.1ha
Regional Reserves	0ha
Total	224.5 ha

The residential targets for the JAC are:

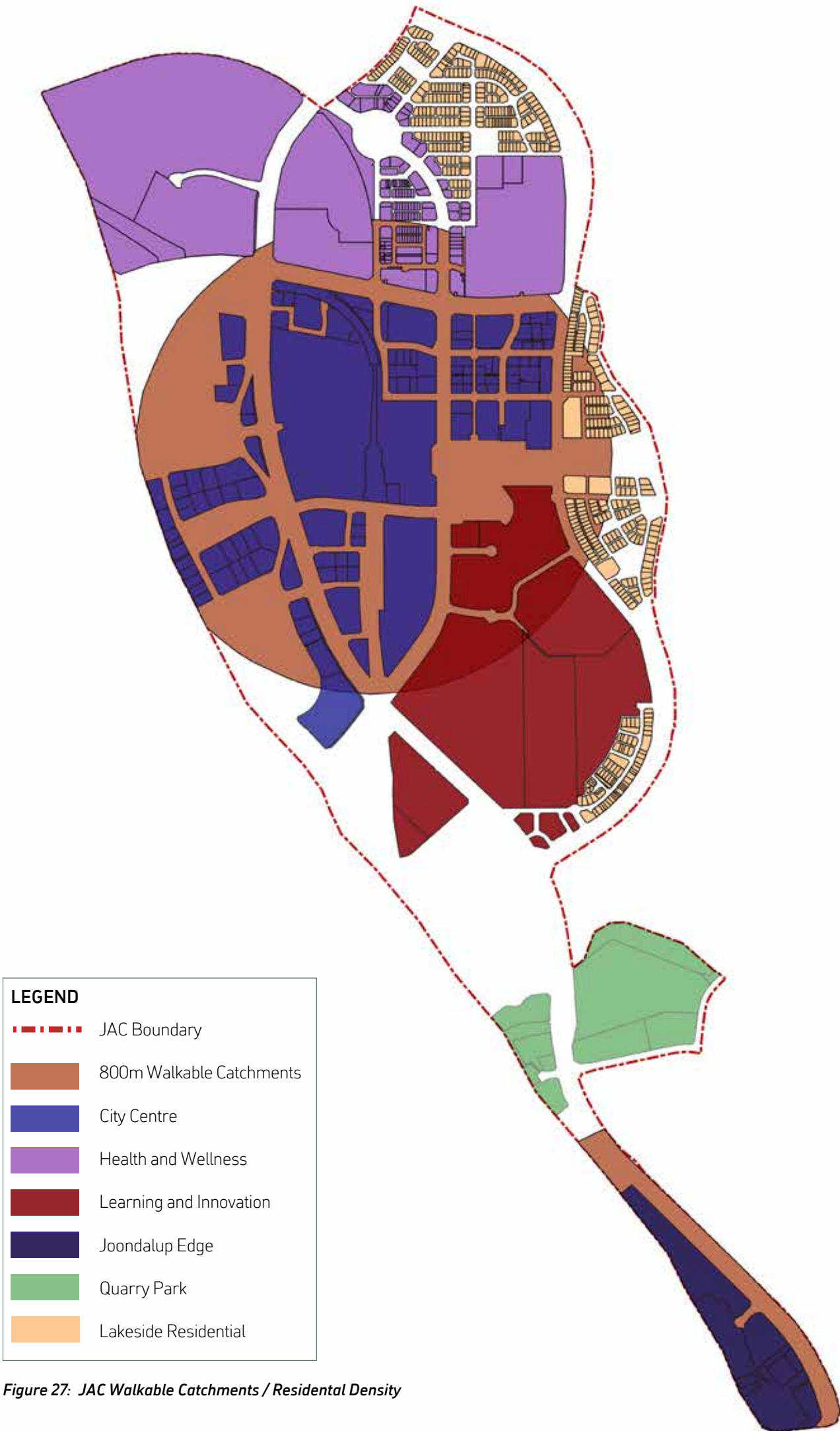
- + Minimum: 6,735 dwellings; and
- + Desirable: 10,102 dwellings.

Table 19 highlights that by 2050 the JAC will have 9,145 dwellings. This is below the 'desirable' target of 10,102. The total size of the JAC is 488ha and it is likely that a portion of the projected 9,145 dwellings will not be located within the walkable catchments.

Figure 27 illustrates the walkable catchment in the JAC relative to the precincts where residential development is permitted. Key points to note include:

- + Majority of the CCP and all of Joondalup Edge are located within the walkable catchments;
- + Portions of the Health and Wellness, Lakeside Residential and Learning and Innovation precincts are within the walkable catchments; and
- + Quarry Park is not within the walkable catchments.

This suggests that if the JAC is to achieve the desirable target as set out in SPP 4.2 then a higher number of dwellings will be required in the CCP and Joondalup Edge. This is achievable due to the flexible development standards in the CCP (e.g. no height limit).



LEGEND

	JAC Boundary
	800m Walkable Catchments
	City Centre
	Health and Wellness
	Learning and Innovation
	Joondalup Edge
	Quarry Park
	Lakeside Residential

Figure 27: JAC Walkable Catchments / Residential Density

06 MOVEMENT

OBJECTIVES

- a) Integrate and prioritise transport modes including local area transit to efficiently connect people with attractions, and destinations in the city centre and region.
- b) Provide safe, functional and attractive interchange facilities and waiting areas for public transport patrons.
- c) Provide safe and attractive streets and public places to enhance the pedestrian experience throughout JAC.
- d) Strengthen east-west movement across the city with pedestrian/cycle connections between Mitchell Freeway, Joondalup West, the City Centre and Lake Joondalup.
- e) Reduce transport conflict by providing dedicated cycle lanes, footpaths separated from vehicles and minimal vehicle crossovers in the city centre.
- f) Provide car parking commensurate with the road network capacity.
- g) Promote short-term, public on-street car parking in highly accessible areas that serve the city centre as a destination.
- h) Consolidate car parking, encourage reciprocal public use and consolidate access to reduce the dominance of cars in the urban landscape.
- i) Provide adequate bicycle parking and end of trip facilities to promote cycling trips within JAC.

6.1 Existing Movement Network

6.1.1 EXISTING ROAD NETWORK

The Stage 1 Transport Assessment for the JACP was undertaken by Arup to review the JAC road hierarchy to address future projected growth. Details of the existing road network are provided on **Figure 28**, including classification in accordance with WAPC's functional road classification system (WAPC Policy No. DC 1.4) and MRWA function road hierarchy (refer to **Table 21**).

Table 20: Existing Traffic Flows and Road Hierarchy Along Major Roads within the JAC

Road Name	Speed Limit (KPH)	Indicative Road Width	AAWDT	MRWA Road Hierarchy
Mitchell Freeway	100	11.5m	65,500 (Main Roads WA Traffic Digest 2014/15 North of Warwick Road)	Primary Distributor
Marmion Avenue	80	8-12m	34,000 (Main Roads WA Traffic Digest 2014/15)	Primary Distributor & Distributor A
Ocean Reef Road	70	8m	48,300 (West of CoJ Border taken in December 2015)	Distributor A
Hodges Drive	70	8.7m	13,100 (Taken in November 2015)	Distributor A & Distributor B
Joondalup Drive	70	9m	32,500 (North of Eddystone Avenue taken in February 2014)	Distributor A
Grand Boulevard	60 & 70	5m	15,500 (East of Joondalup Drive North taken in March 2014)	Distributor A
Shenton Avenue	70	9m	27,400 (West of Mitchell Freeway taken in December 2015)	Distributor A
Lakeside Drive	60	4.3-14.5m	10,100 (East of Joondalup Drive South taken in March 2014)	Distributor B
Moore Drive	70	6.1-10m	13,000 (West of Mitchell Freeway Bridge taken in November 2015)	Distributor A
Eddystone Avenue	50	8m	9,400 (West of Honeybush Drive taken in June 2014)	Distributor B



6.1.1.1 ROAD HIERARCHY DEFINITIONS

Table 21: Road Hierarchy Definitions

	MRWA Function Road Hierarchy	WAPC Functional Road Classification System - Policy No. DC 1.4
LOCAL DISTRIBUTOR	<p>Local Distributor roads are managed by local government.</p> <p>Built Up Area - Roads that carry traffic within a cell and link District Distributors or Primary Distributors at the boundary, to access roads. The route of Local Distributors should discourage through traffic so that the cell formed by the grid of higher order distributor roads, only carries traffic belonging to, or serving the area. Local Distributors should accommodate buses, but discourage trucks.</p>	<p>Local Distributors carry traffic within a cell and link district distributors at the boundary to access roads. The route of the local distributor discourages through traffic so that the cell formed by the grid of district distributors is free from extraneous traffic. The local distributor carries only traffic belonging to or serving the cell.</p>
DISTRICT DISTRIBUTOR B	<p>District Distributor A and B roads run between built up area land-use cells and generally not through them, forming a grid which would ideally space them about 1.5 kilometres apart. They are managed by local government.</p>	<p>District Distributors carry traffic between different industrial, commercial, and residential areas and link these cells to the primary network. Roads of this type run between cells of compatible land use, not through them, and therefore tend to form a grid system. The spacing of the grid depends upon the land use and traffic generation within the cell and is often up to 1.5 kilometres square.</p>
DISTRICT DISTRIBUTOR A	<p>Perform a similar function to type A District Distributors, but with reduced capacity due to flow restrictions caused by frequent property accesses and roadside parking in many instances. These are often older roads with a traffic demand in excess of that originally intended.</p> <p>Carry traffic between industrial, commercial and residential areas and generally connect to Primary Distributors. These are likely to be truck routes and provide only limited access to adjoining property.</p>	
REGIONAL DISTRIBUTOR	<p>Roads that are not Primary Distributors, but which link significant destinations and are designed for efficient movement of people and goods within and beyond regional areas. They are managed by local government.</p>	NA
PRIMARY DISTRIBUTOR	<p>Provide for major regional and inter-regional traffic movement and carry large volumes of generally fast moving traffic. Some are strategic freight routes and all are State Roads. They are managed by Main Roads Western Australia.</p>	<p>Primary Distributors form the top level network for the urban region. They carry longer distance traffic to, from, and across the urban area. Some will connect with the State or national road network running between urban areas.</p>

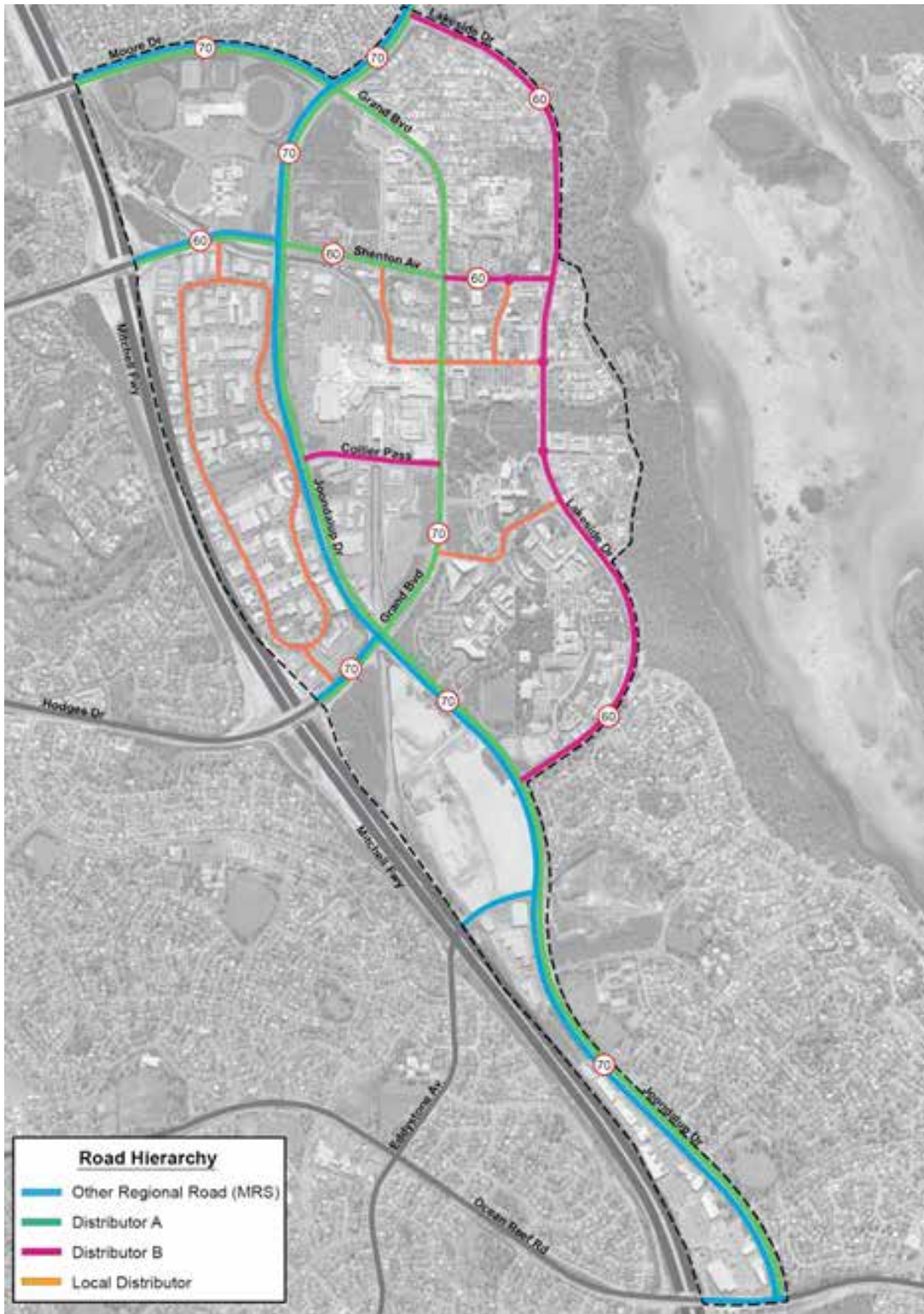


Figure 28: Joondalup Activity Centre Road Network
 Source: MRWA Road Information Mapping System



6.1.1.2 JOONDALUP DRIVE

The JAC is dissected by Joondalup Drive, a District Distributor A road which runs from Ocean Reef Road in the south to Burns Beach Road in the north-east. Within the WAPC MRS it is identified as an Other Regional Road (ORR). Joondalup Drive is a dual carriageway with a central median and has a posted speed limit of 70km/h for its entire length. Data collected in 2014 determined average weekday flows of 27,199 Vehicles Per Day (VPD) north of Ocean Reef Road.

6.1.1.3 GRAND BOULEVARD

Grand Boulevard is classified as a Distributor A road which runs north-south from Joondalup Drive/Moore Drive to Joondalup Drive/Hodges Drive. For the majority of its length it is a dual carriageway with a central median. It has a posted speed limit of 50km/h north of Collier Pass to south of Moore Drive. South of Collier Pass it has a posted speed limit of 70km/h.

Data collected in 2013 determined average weekday flows of 14,123 VPD north of Joondalup Drive south. According to the MRWA Regional Operations Model (ROM), in 2016 it is anticipated to carry approximately 28,900 VPD north of Joondalup Drive south.

6.1.1.4 MOORE DRIVE

Moore Drive runs west of Joondalup Drive/Grand Boulevard to Marmion Avenue. It is classified as a Distributor A road and is identified within the MRS as an ORR. Within the boundary of the JAC it is a dual carriageway with a central median and has a posted speed limit of 70km/h.

Data collected in 2014 determined average weekday flows of 13,134 VPD west of Joondalup Drive. According to the MRWA ROM, in 2016 it is anticipated to carry approximately 21,800 VPD east of the Mitchell Freeway.

6.1.1.5 HODGES DRIVE

Hodges Drive runs south-west of Joondalup Drive/Grand Boulevard to Ocean Reef Road via Marmion Avenue and Mitchell Freeway. The intersection of Mitchell Freeway and Hodges Drive is located on the western boundary of the JAC.

It is classified as a Distributor A road and is identified within the MRS as an ORR. Within the boundary of the JAC it is a dual carriageway with a central median and has a posted speed limit of 70km/h.

Data collected in 2012 determined average weekday flows of 26,600 VPD west of Joondalup Drive. According to the MRWA ROM, in 2016 it is anticipated to carry approximately 31,100 VPD west of Joondalup Drive.

6.1.1.6 LAKESIDE DRIVE

Lakeside Drive is classified as a Distributor B road which runs north-south from Joondalup Drive (north) to Joondalup Drive (South). It is single carriageway with a central median and has a posted speed limit of 50km/h within the CCP and 60km/h outside.

Data collected in 2014 determined average weekday flows of 10,122 VPD east of Joondalup Drive north and 7,620 VPD east of Joondalup Drive south. According to the MRWA ROM, in 2016 it is anticipated to carry approximately 7,200 VPD and 8,000 VPD respectively.

6.1.1.7 SHENTON AVENUE

Shenton Avenue runs east-west via Mitchell Freeway between Lakeside Drive in Joondalup and Ocean Reef Road in Iluka. The intersection of Mitchell Freeway and Shenton Avenue is located on the western boundary of the JAC. Shenton Avenue is classified as a Distributor B road between Lakeside Drive and Grand Boulevard and a Distributor A road between Grand Boulevard and Mitchell Freeway. The section between Mitchell Freeway and Joondalup Drive is identified within the MRS as an ORR. Within the JAC boundary Shenton Avenue is a dual carriageway with a central median and has a posted speed limit of 60km/h.

Data collected in 2014 determined average weekday flows of 23,396 VPD west of Joondalup Drive and data from 2011, 17,834 VPD east of Joondalup Drive.

The 2016 MRWA ROM estimates that only 6,300 VPD will use Shenton Avenue east of Joondalup Drive. This is 10,000 VPD less than recorded in 2011.

6.1.2 EXISTING CAR PARKING

An inventory of off street car parking within the Joondalup Activity Centre is provided in **Figure 29** and **Table 23**. As shown, there are currently approximately 15,600 off-street car parking bays available across the activity centre. This is expected to increase with the completion of the multi-story Edgewater Train Station Park and Ride (approximately 1000 new bays).

Table 22: Off-Street Car Parking Inventory in the JAC

Ref	Location	Name	Type	Bays*	Cost/hour (short-term)
1	McLarty Ave 1	McLarty Ave 1	Outdoor/At Grade	170	\$1.30
2	McLarty Ave 2	McLarty Ave 2	Outdoor/At Grade	140	\$1.30
3	Boas Avenue	Reid Promenade Car Park	Multistorey	540	\$1.00
4	Davidson Tce 1	Davidson Tce 1	Outdoor/At Grade	70	\$0.80
5	Boas Ave/Davidson Tce	Central Walk Car Park	Outdoor/At Grade	300	\$1.30
6	Lawley Court	Lawley Court	Outdoor/At Grade	250	\$0.80
7	Davidson Tce 2	Davidson Tce 2	Outdoor/At Grade	40	\$0.80
8	Grand Boulevard	Central Park West	Outdoor/At Grade	40	\$0.80
9	Wise Street	Wise Street	Outdoor/At Grade	100	\$0.80
10	Collier Pass	Collier Pass	Outdoor/At Grade	90	\$0.80
11	Lakeside Shopping Centre	Lakeside Shopping Outdoor Parking	Outdoor/At Grade	2230	-
12	Lakeside Shopping Centre	Lakeside Shopping Multistorey Parking	Multistorey	2380	-
13	Lot 807,	Bunnings	Outdoor/At Grade + Undercover	790	-
14	Lot 806,	Masters Home Improvement	Outdoor/At Grade	510	-
15	Arena Joondalup	Arena Joondalup P1	Outdoor/At Grade	40	-
16	Arena Joondalup	Arena Joondalup P2	Outdoor/At Grade	420	-
17	Arena Joondalup	Arena Joondalup P3	Outdoor/At Grade	360	-



Ref	Location	Name	Type	Bays*	Cost/hour (short-term)
18	Edgewater Train Station	Edgewater Train Station	Outdoor/At Grade	1000	Varying
19	North Metropolitan TAFE	West Coast I.O.T. P1	Outdoor/At Grade	350	Permit
20	North Metropolitan TAFE	West Coast I.O.T. P2	Outdoor/At Grade	200	Permit
21	Joondalup Health Campus	Joondalup Health Campus	Outdoor/At Grade	1110	\$2.00
22	Joondalup Health Campus	Joondalup Health Campus	Outdoor/At Grade		\$2.00
23	Joondalup Health Campus	Joondalup Health Campus	Outdoor/At Grade		\$2.00
24	Joondalup Health Campus	Joondalup Health Campus	Outdoor/At Grade		\$2.00
25	Joondalup Drive	Retail (Spotlight, Good Guys, Bedshed.etc)	Outdoor/At Grade	530	-
26	Joondalup Drive	Retail (various small-medium retail stores)	Outdoor/At Grade	280	-
27	Mclarty Avenue	Curtin University Joondalup Campus	Outdoor/At Grade	100	-
28	Dwyer Turn	Retail (Officeworks, Food outlets)	Outdoor/At Grade	240	-
29	Injune Way	College of Electrical Training/Motor Industry Training	Outdoor/At Grade	280	-
30	Joondalup Drive	Various Commercial (Harvey Norman/Dick Smith)	Outdoor/At Grade	370	-
CP1-CP14	ECU Joondalup Campus	ECU Joondalup Campus	Outdoor/At Grade	2770	Permit
TOTAL				15,670	

*Rounded to nearest 10.

There are a number of streets which offer on-street parking in the JAC. The price and time limits of these bays varies depending on their location with centrally located bays charged at a premium rate (**Table 24**). For comparison, the City of Perth charges \$4.30 per hour for on-street parking in the inner city area.

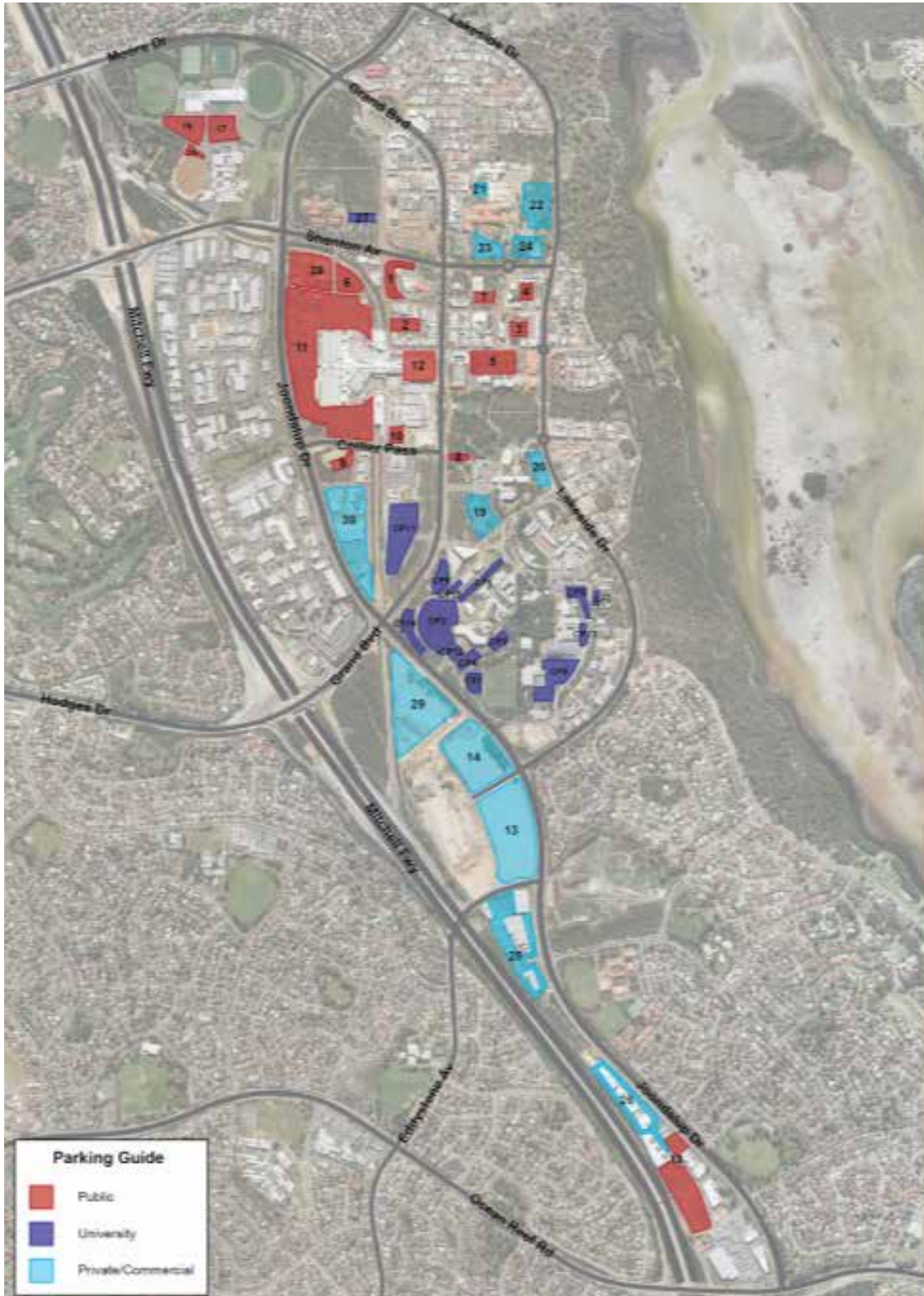


Figure 29: Off-street car parking locations in the JAC



Table 23: On-Street Car Parking Rates in JAC

Area	Timing Charge Unit	Fee (\$2015)
On-street short-term		
Time limit ¼ hour to 2 hours	Hourly fee	\$1.50
On-street long-term		
Outer city centre	Hourly fee	\$0.80
	Daily fee	\$4.00
	Weekly fee	\$20.00
Inner city centre	Hourly fee	\$1.10
	Daily fee	\$5.50
	Weekly fee	\$27.50

6.1.3 EXISTING PEDESTRIAN AND CYCLE NETWORK

The City’s Draft Bike Plan is aimed to guide the Perth Bicycle Network Plan in the Joondalup area. The existing JAC cycle network is mainly on road. This has limited the mode share of cycling to roughly 15%. The existing principal shared path adjacent to Mitchell Freeway provides cyclists with connectivity to other activity centres and train stations both north and south of Joondalup and to the Perth CBD and beyond. The current lack of east-west connectivity within the activity centre contributes to the disconnection between Joondalup and Wanneroo activity centres. The CoJ Draft Bike Plan (2016-2021) included a technical review of the existing bicycle network to inform future infrastructure upgrades.

Pedestrian access to public transport within the activity centre has been noted as an issue by the PTA. Furthermore, the large number of high order roads in the JAC creates barriers for pedestrian movements within the city.



Figure 30: City of Joondalup active cycle network



6.1.4 EXISTING PUBLIC TRANSPORT NETWORK

JAC is very well serviced by bus and train. Two train stations, on the Perth-Butler Line are situated within JAC, Edgewater Station and Joondalup Station. Joondalup Station is located directly adjacent to the Joondalup Bus Transfer Station and below the Lakeside Shopping Centre. This location has the potential to give passengers great access to the wider JAC, however, there are access issues for pedestrians out of hours when the Lakeside Shopping Centre is closed. Furthermore, the station is surrounded by car parking on the eastern and western side further inhibiting access for pedestrians and cyclists.

Edgewater Station is located in the southern section of the activity centre and is focused on park and ride access. There are no bus interchange facilities located at the station and pedestrian access from the east is constrained by commercial development and Joondalup Drive.

The JAC is also served by numerous bus routes, of which 15 TransPerth routes service Joondalup Bus Station. These routes provide access to Lakeside Joondalup and train stations along the Joondalup line from other neighbouring centres and have been summarised in **Table 25**. These have been colour coded according to the DOP definition of a 'high frequency' service (Transport Impact Assessment Guidelines, 2016):

- + 19 minutes in peak periods;
- + 15 minutes during inter-peak periods, early evening and peak weekend periods; and
- + 30 minutes at other times.

Two CAT routes provide passengers with great connectivity within the JAC, and to other major attractions such as the two train stations, ECU, the Civic Centre and Joondalup Health Campus.



Figure 31: Existing public transport network and stops



Table 24: Existing bus services in JAC network

(colour coded to define service type to DoP Transport Impact Assessment Guidelines, 2016)

Bus No.	Departure	Destination	AM Peak Services*	PM Peak Services*	Sat Peak Services*
390	Joondalup Station	Carramar	-	6	-
390	Banksia Grove	Joondalup Station	5	5	1
390	Joondalup Station	Banksia Grove	2	6	1
391	Banksia Grove	Joondalup Station	5	2	1
391	Joondalup Station	Banksia Grove	-	6	1
460	Joondalup Station	Whitfords Station	2	2	-
460	Whitfords Station	Joondalup Station	2	4	-
461	Joondalup Station	Mullaloo	-	3	-
461	Joondalup Station	Whitfords Station	1	1	2
461	Whitfords Station	Joondalup Station	-	4	1
461	Mullaloo	Joondalup Station	1	-	-
462	Joondalup Station	Whitfords Station	3	3	-
462	Whitfords Station	Joondalup Station	2	2	-
463	Belridge Senior High School	Joondalup Station	1	-	-
463	Joondalup Station	Whitfords Station	2	1	1
463	Whitfords Station	Joondalup Station	1	2	1
464	Joondalup Station	Whitfords Station	2	2	1
464	Whitfords Station	Joondalup Station	2	4	1
465	Joondalup Station	Whitfords Station	1	1	1
465	Whitfords Station	Joondalup Station	2	3	1
466	Joondalup Station	Whitfords Station	2	2	1
466	Whitfords Station	Joondalup Station	2	3	1
467	Joondalup Station	Wanneroo Shop Ctr	-	1	-
467	Joondalup Station	Whitfords Station	3	5	1
467	Whitfords Station	Joondalup Station	3	4	1
468	Whitfords Station	Joondalup Station	3	4	1
468	Joondalup Station	Whitfords Station	2	4	1
470	Burns Beach	Joondalup Station	1	1	1
470	Joondalup Station	Burns Beach	-	2	1
471	Kinross	Joondalup Station	3	1	1
471	Joondalup Station	Kinross	-	2	1
473	Joondalup Station	Kinross	-	2	1
473	Joondalup Station	Kinross College	1	-	-
473	Kinross	Joondalup Station	-	1	1
474	Clarkson Station	Joondalup Station	2	1	-
474	Kinross	Joondalup Station	-	1	-
Blue CAT	Joondalup Station	Joondalup Station	4	4	-
Red CAT	Joondalup Station	Joondalup Station	4	4	-

* Services measured as buses per hour.

6.2 Future Movement Network

6.2.1 CHANGES/ADDITIONS TO EXISTING ROAD NETWORK

The following section highlights where potential hierarchy reclassification and thus the regional role of the corridor within the network should be further investigated. It should be noted that as a result of discussions with Main Roads WA on 26th November 2015, it is understood that the road hierarchy classification criteria and application process for road hierarchy changes is currently under review. Following this review, the suggestions outlined could be reviewed and progressed as required.

The current and suggested hierarchy reclassification (where relevant) are summarised in **Table 26**:

Table 25: Proposed Road Hierarchy Changes

Road Name	Current Speed Limit (kph)	2015 AAWDT	MRWA Road Hierarchy	Relevant Volume to Upgrade	Proposed Main Roads WA Road Hierarchy	Proposed Speed Limit (kph)
Mitchell Freeway	100	44 400 (Main Roads WA Traffic Digest 2014/15 North of Ocean Reef Road)	Primary Distributor		Remain as a Primary Distributor	100 (no proposed change)
Ocean Reef Road	70	50 920 (Main Roads WA Traffic Digest 2014/15 East of Joondalup Drive)	Distributor A	Warrants for upgrade to Primary distributor are currently under review with Main Roads WA	Upgrade to Primary Distributor	70 (no proposed change)
Hodges Drive (west of Joondalup Drive)	70	27 580 (Main Roads WA Traffic Digest 2014/15)	Distributor A		Remain as a Distributor A	70 (no proposed change)
Joondalup Drive	70	32 880 (Main Roads WA Traffic Digest 2014/15 North of Hodges Drive)	Distributor A		Remain as a Distributor A	60
Grand Boulevard	50 (North of Collier) & 70 (south of Collier)	15 500 (East of Joondalup Drive North taken in March 2014)	Distributor A	Distributor A volumes greater than 8000 VPD Distributor B volumes greater than 6000 VPD	Downgrade to Distributor B	50 (North of Collier, reduced to 40 during peaks) & 60 (South of Collier)
Shenton Avenue	70	29 790 (Main Roads WA Traffic Digest 2014/15 East of Mitchell Freeway)	Distributor A		Remain as a Distributor A	70 (no proposed change)



Table 26: Proposed Road Hierarchy Changes Continued

Road Name	Current Speed Limit (kph)	2015 AAWDT	MRWA Road Hierarchy	Relevant Volume to Upgrade	Proposed Main Roads WA Road Hierarchy	Proposed Speed Limit (kph)
Lakeside Drive	60	10 100 (East of Joondalup Drive South taken in March 2014)	Distributor B	Distributor A volumes greater than 8000 VPD Distributor B volumes greater than 6000 VPD	Upgrade to Distributor A	60 (no proposed change)
Moore Drive	70	13 0060 (Main Roads WA Traffic Digest 2014/15 East of Candlewood Boulevard)	Distributor A	Distributor A volumes greater than 8000 VPD Distributor B volumes greater than 6000 VPD	Downgrade to Distributor B	70 (no proposed change)
Eddystone Avenue	50	9400 (West of Honeybush Drive taken in June 2014)	Distributor B		Remain as a Distributor B	50 (no proposed change)

Ocean Reef Road

CoJ applied for Ocean Reef Road to be classified as a Primary Regional Road (a “highway”) under the Main Roads Act in 2011. This application was subsequently rejected largely due to the difference in local council and Main Roads WA assessment of the network role of the road.

Ocean Reef Road is carrying close to 50,000 VPD (east of Joondalup Drive) which is significantly higher than the current Primary Distributor Roads in the area are carrying. For example, Wanneroo Road is carrying approximately 43,000 VPD north of Ocean Reef Road and is a Primary Distributor.

Upgrading Ocean Reef Road to a Primary Distributor would create a connected state road system in the northern suburbs of Perth (Marmion Ave, Ocean Reef Road and Wanneroo Road). It is noted that Main Roads WA are currently reviewing their Road Classification Criteria. Following this review, it is recommended that the upgrade of this section of Ocean Reef Road be revisited.

Lakeside Drive

East of Joondalup Drive, Lakeside Drive is currently carrying approximately 10,000 VPD. Volumes over 8,000 VPD could warrant the upgrade to a District Distributor A.

Joondalup Drive / Grand Boulevard

Currently both Grand Boulevard and Joondalup Drive are classified as District Distributor A roads. Both roads run parallel north/ south through the JAC. It is proposed to downgrade Grand Boulevard to a District Distributor B, and reduce the speed limit south of Collier Pass from 70kph to 60 kph and north of Collier Pass from 50kph section to 40kph in peak periods. Bus priority is also recommended on part of Grand Boulevard, by reducing the amount/scale of on-street parking with potential long term provision for light rail, and focusing on one through traffic lane. It is also proposed to reduce the speed limit of Joondalup Drive to 60kph.

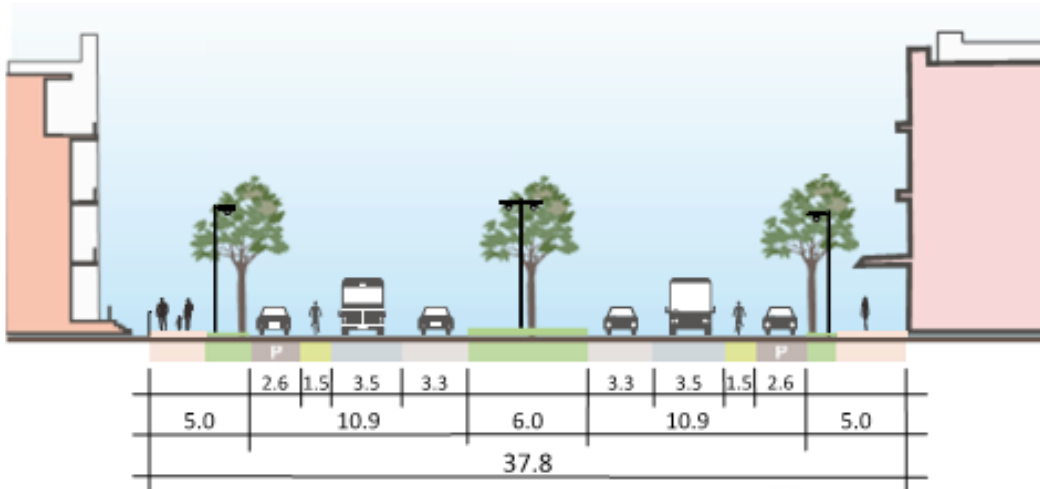


Figure 32: Example of an Integrator A Arterial adjacent to an activity centre

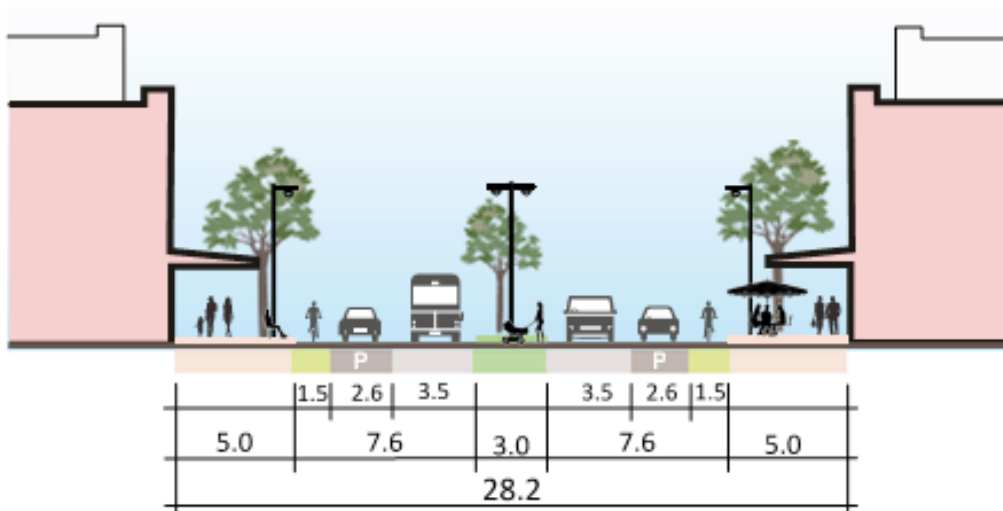


Figure 33: Example of an Integrator B arterial – activity centre main street



6.2.2 TRAVEL DEMAND MANAGEMENT / CAR PARKING

In determining the likely future parking provision to balance available road network capacity, analysis has been undertaken at a strategic level to understand appropriate inputs into the transport modelling. The final outputs will guide the parking policy and provision of parking within the Activity Centre.

Three different methodological approaches have been undertaken to understand a likely suitable level of parking provision with the activity centre.

Table 26: JAC Forecast Car Parking Provisions

2016 (Existing)	JACP (Ultimate)	Units/Comments
Based on Floor Space Projections		
842435	1517365	Employment floor space
1.840	1.840	Bays per100 sqm
15,500	28,000	Parking bays in JAC
Based on Employment Projections		
17025	44983	Jobs
0.91	0.91	Bays per job
15,500	41,000	Parking bays in JAC
Parking Rate		
Current	Future	
1 bay per 30 sqm	1 bay per 45 sqm	City's parking policy had aspirations for this rate
28,081	33,700	Parking bays in JAC (if applied to all bays)
15,500	30,500	Parking bays in JAC (if applied to new bays)

Depending on the measure, the implied number of parking bays required for ultimate JAC land use will be in the order of 28,000 to 41,000 bays. Based on the current levels of congestion on the network, mode share and profile of traffic over the day, the road network could not accommodate this level of additional parking.

Combined with planned growth in bays at ECU and Joondalup Health Campus of more than 5,000 bays, and with the future expansion of Lakeside Joondalup, this would leave only a small number of bays for remaining uses in the centre. A total parking bay amount in the order of 25,000 would appear reasonable when compared to other centres, noting that the Murdoch Activity Centre is the only cap limit (17,500) endorsed by the WAPC. This amount of parking level will be confirmed with the traffic modelling. If confirmed by the modelling, this would indicate that the activity centre area can accommodate an additional 10,000 bays above existing levels.

Based on the above, it is recommended the following principles guide the development of parking with the Activity Centre:

- + Focus on opportunities multi-use bays which are shared between compatible land uses with different peak periods. For example the Lakeside retail centre and city core commercial development. The CoJ of multi-deck car park will, if located appropriately, enhance this outcome provided their use can be encouraged by surrounding land uses;
- + The ability to provide car bays located on the edges of the activity centre and away from congested locations. These preferred locations are summarised in the implementation plan in this report but are generally located near Shenton Avenue. Further possible locations are areas such as HBF arena, provided access could be restricted to Moore Drive (limiting traffic impact on Joondalup Drive) which then could be used as a shuttle service;

- + Engaging with ECU, HBF Arena, Joondalup Health Campus and Lakeside Shopping Centre to provide an integrated approach to parking within the activity centre;
- + Developing an implementation strategy noting that the difficulty that the city may face with a parking cap (or parking maximums), is that there is no additional funding certainty for public transport services within the centre. An alternative approach by CoJ is to provide a minimum parking with an appropriate cash in lieu price signal to encourage developers to provide cash in lieu payments for bays not constructed. It is understood that the cash in lieu funds can then be utilised for public transport enhancements within the city. This approach has as a risk that the maximum number of bays cannot be easily enforced. Further consideration will be required in a detailed parking management plan and update to the City's parking policy;
- + Develop a parking monitoring system to actively monitor utilisation; and
- + Consider the impact of technology changes such as car sharing, reducing car ownership and electric vehicles (charging spots) have on parking supply and configuration.

6.2.3 INTERSECTION CONTROLS

A new 4-way intersection at Kennedy/Joondalup drive will be required to facilitate east-west movements for both bus rapid transit and light rail transit in the future. This intersection is preferred to be signalised to allow bus priority and subject to further discussion with Main Roads and the development of the Department of Housing residential land.

Additionally to complement the plans of establishing a bus rapid transport network, the following existing signalised intersections will require bus priority signals:

- + Joondalup Drive / Collier Pass; and
- + Grand Boulevard / Collier Pass.

Additionally, due to the current priority arrangements, the following intersections will most likely require upgrade:

- + Lakeside Drive/Joondalup Drive (north); and
- + Wedgewood Drive/Joondalup Drive.

6.2.4 NETWORK UPGRADES

Access to the Mitchell Freeway will be critical in the future to maintain a level of access to JAC for road traffic and efficient road use within JAC itself.

In the absence of significant road network upgrades within the centre, which are generally limited, it is proposed to align the interchanges with the Mitchell Freeway at Ocean Reef Road, Hodges Drive and Shenton Avenue to access the different precincts of the JAC. This is important to provide appropriate road network capacity for the network internal to JAC. For example, the existing situation allows the majority of access capacity to ECU and Lakeside Joondalup (the major trip generators) is provided by the Hodges Drive interchange which also has a range of capacity issues.

To assist in understanding the desire lines for each interchange, **Figure 35** indicates the desirable catchment in the future. Regardless of the interchange use, there will be requirement to upgrade arterial road capacity (ie Ocean Reef Road, Hodges Drive and Shenton Avenue) between the Mitchell Freeway and Joondalup Drive. This may not necessarily mean addition physical infrastructure, rather better signal coordination and potential restrictions in capacity to better match the catchments in **Figure 35**.



6.2.5 PEDESTRIAN AND CYCLE NETWORKS

To combat the lack of east-west connectivity in Joondalup's existing cycle network, six new cycle paths have been proposed to connect Lake Joondalup with the existing Principal Shared Path (PSP_ running adjacent to Mitchell Freeway). Pedestrian connectivity will be improved at the intersection of Collier Pass and Joondalup Drive and at the connection of Edgewater Station across Joondalup Drive.

6.2.6 PEDESTRIAN ACCESS TO JOONDALUP TRAIN STATION

There is an aspiration to create a new station square to the south of Collier Pass to improve the pedestrian experience and connectivity at the Joondalup train station. The square would be constructed over the rail line and connected to the station via a southward extension of the train platform under the road bridge. Engineering investigation and collaboration with PTA will be required. The new square would provide an excellent transit node and arrival point for the CCP, with opportunity to include cycle parking and other mode shift facilities.

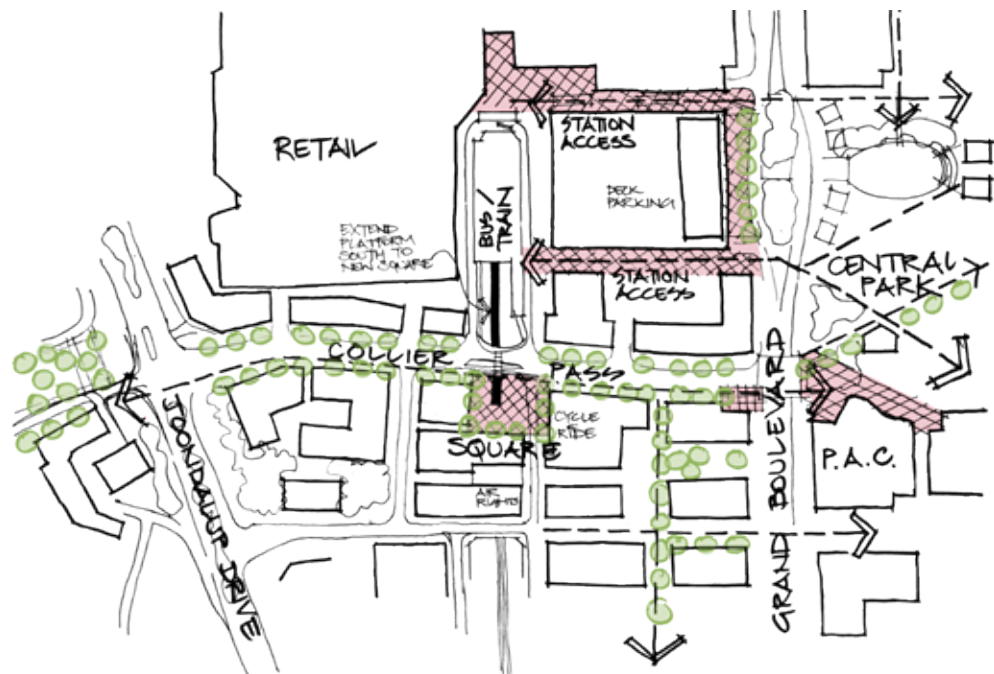


Figure 34: Train Station Connection

6.2.7 PUBLIC TRANSPORT ROUTES - LOCAL AREA TRANSIT

There is a long-term goal for light rail transit to be implemented within the activity centre to increase network connectivity. Bus rapid transit will be promoted to achieve this goal in the short term. The transition from bus rapid transit to light rail will only occur once patronage warrants the need.

The establishment of bus rapid transit will require new bus lanes and bus priority signal optimisation at various locations including:

- + Queue jumps/bus priority on Joondalup Drive between Collier Pass and Ocean Reef Road;
- + Bus Lanes on Collier Pass between Joondalup Drive and Grand Boulevard; and
- + Bus lanes on Grand Boulevard between Joondalup Drive and Queensbury Road.

Further to these changes there is potential for high occupancy transit lanes to be constructed as a trial for WA, to improve access to the south along Joondalup Drive.

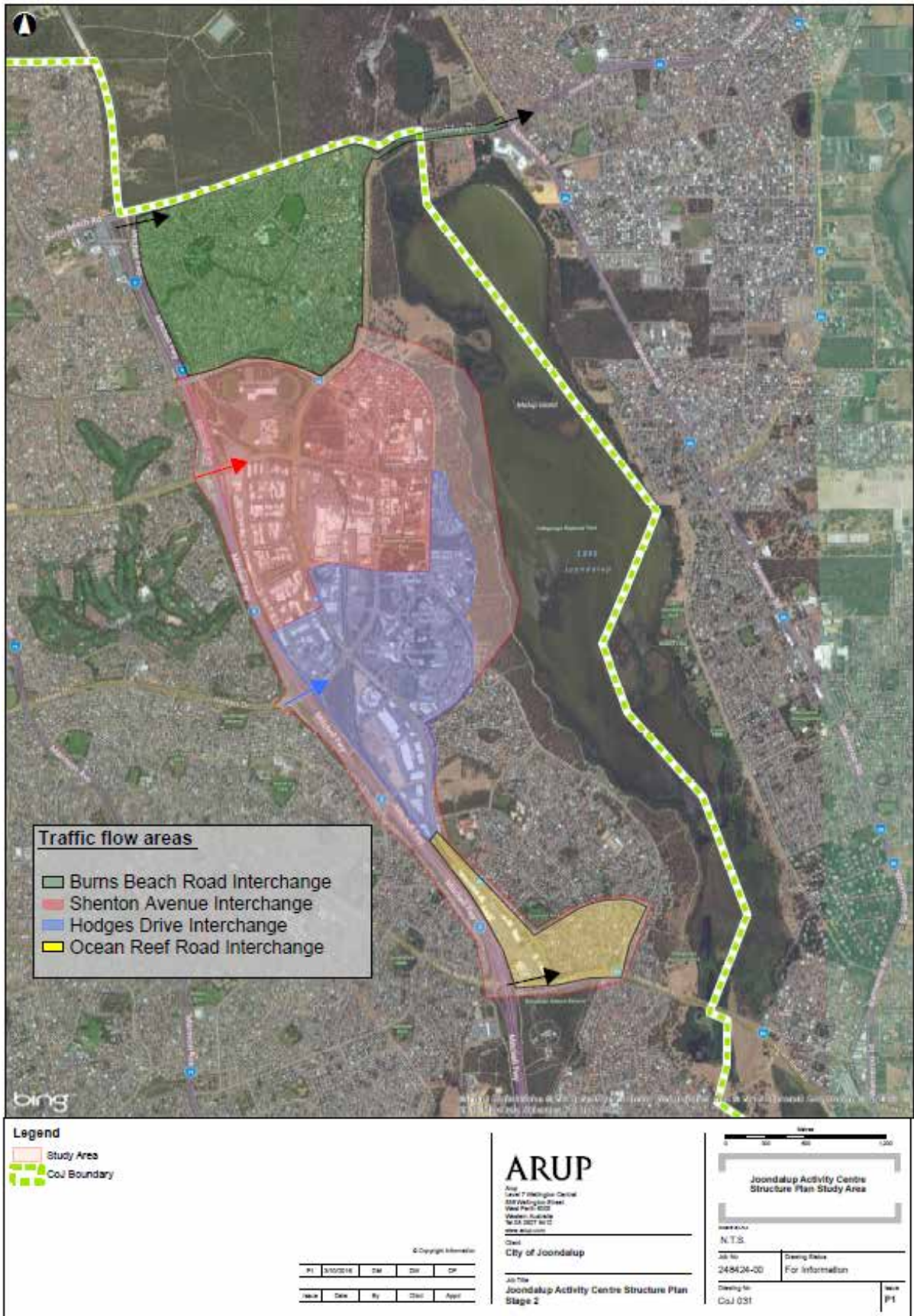


Figure 35: Desired Freeway Interchange Catchments for JAC

07 URBAN FORM

OBJECTIVES

- a) Create an identifiable and unique civic heart that is enlivened and activated through a series of connected city squares, each with a unique character and function.
- b) Create an attractive city centre that sets Joondalup apart through the use of high-quality design, materials, street furniture, public art, landscape and the retention of vegetation where appropriate.
- c) Promote buildings with scale and character that reflects JAC's status as the primary centre of the north-west sub-region.
- d) Encourage development at gateways to the city to enhance arrival and contribute to the city's character and identity.
- e) Encourage increased development intensity, building scale and design quality along transport corridors to appropriately frame the city centre.
- f) Encourage buildings and development that are able to adapt to changing economic, technological, environmental and social conditions.
- g) Encourage buildings that have a well-considered relationship to the street, enabling the city to become more intense and active while retaining a human scale.
- h) Enhance the natural environment and emphasise the existing 'bush' identity and landscape quality throughout the JAC.

7.1 Urban Structure

7.1.1 EXISTING URBAN STRUCTURE AND ACTIVITY

The existing urban form of the JAC consists of expansive, low-density land uses and car parking areas, there are also significant portions of land which remain undeveloped demonstrating the significant opportunity for new development and redevelopment in the JAC. Despite having a number of landowners with significant landholdings there is little collaboration. Development is undertaken independently and ownership is fragmented which makes coordinated redevelopment difficult.

7.1.1.1 EXISTING ACTIVITY NODES

The existing urban structure in the JAC is underpinned by key activity nodes. The activity nodes in the JAC form part of a polycentric city model, whereby there are multiple centres of activity as opposed to one, as illustrated on **Figure 37**.

Figure 36 illustrates the polycentric city model and how it applies in the JAC. When combined, the activity nodes form activity clusters or character areas. It conceptualises these nodes into precincts, grouping areas with similar activity and land use, role and function and future potential

The urban design propositions have been based on a detailed analysis of the JAC urban form and considers its transitional development since inception. The propositions seek to strengthen the intrinsic qualities of the JAC, whilst establishing a framework for its future development.

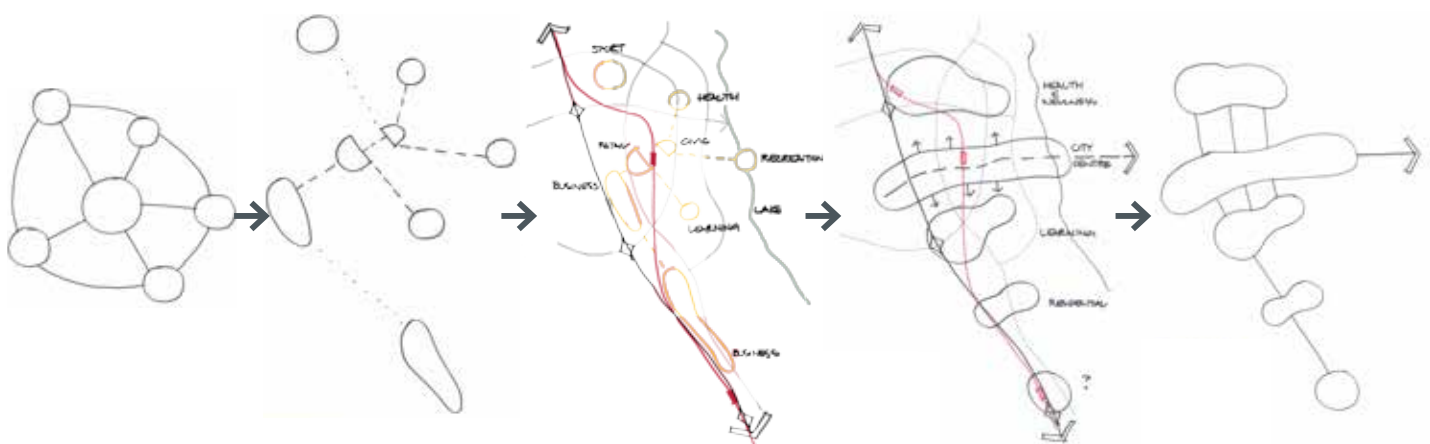


Figure 36: Polycentric City Model Applied to the JAC



The existing activity nodes can be described as follows:

Sport

The north-west portion of the JAC consists of various sporting ovals and facilities that contribute to City's regional sport and recreation offering. Lake Joondalup Baptist College has developed and expanded, separate from the sport and recreation precinct also consisting of two private ovals. There is no integration between the two areas as they are separated by Kennedy Drive and at grade car parking. There is an opportunity to create an urban edge along Joondalup Drive and for development to the west of Lake Joondalup Baptist College.

Health

Joondalup Health Campus is the most prominent land use, it is surrounded by ancillary health uses and expansive areas of at grade car-parking. The Joondalup Health Campus has no street presence and is detached from the CCP to the south.

Civic

The Civic Centre and city centre has a distinct urban form that is unique in the JAC. Buildings are generally 2-4 storeys, however, large road reserves adversely impact the pedestrian experience. The JAC has not developed at the scale that was originally intended, as such the redevelopment of existing buildings will be required to intensify development.

Retail

The centre of the JAC is dominated by the Lakeside Shopping Centre and its surrounding car parking areas, this has taken the vibrancy and focus away from other area in the JAC such as Boas Avenue and Central Walk. The shopping centre is a traditional 'big-box' retailer and does not integrate with the rest of the JAC as majority of its uses are internalised. It also limits access to and from the Joondalup Train / Bus Transfer Station.

Learning

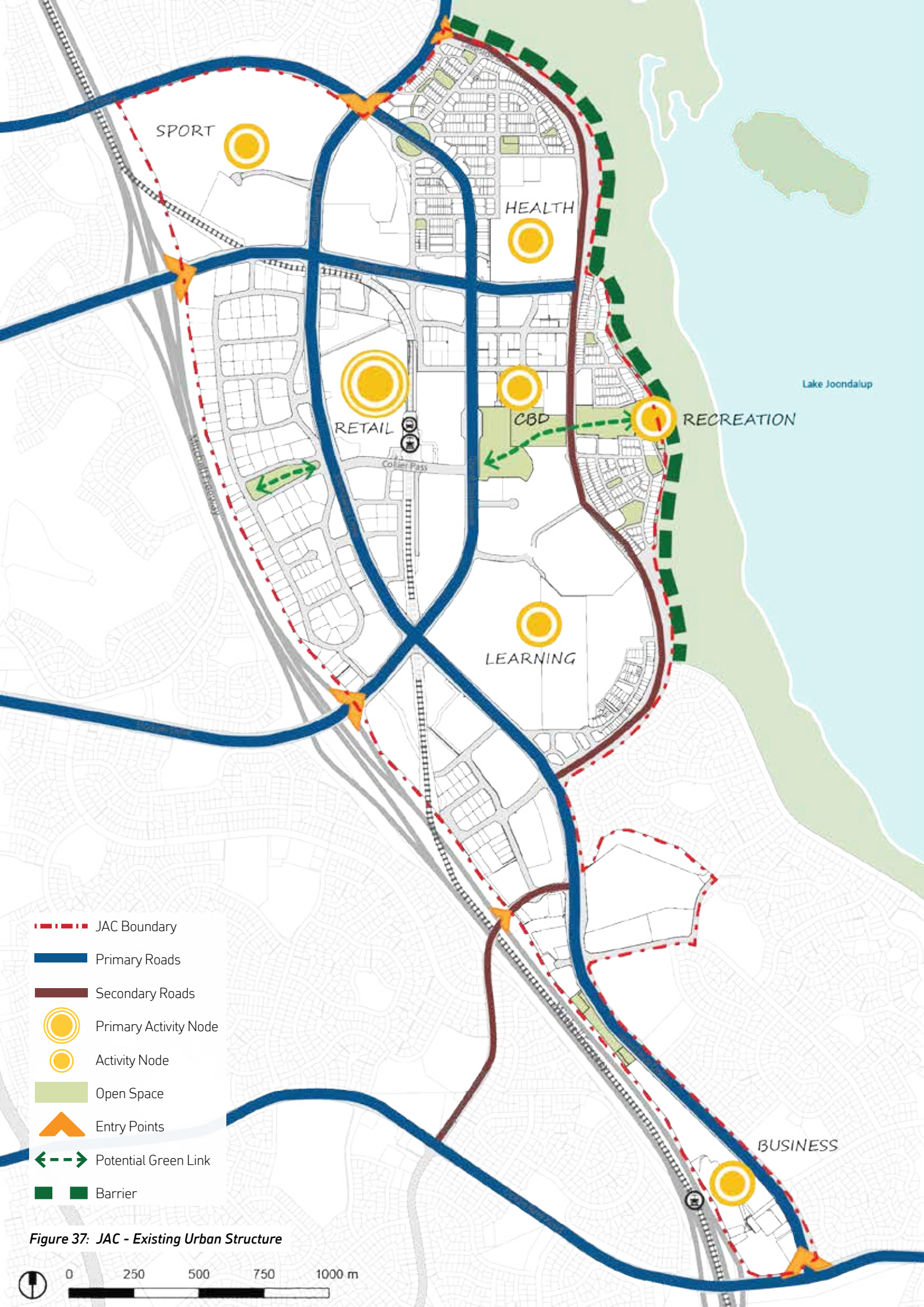
The built form in the existing learning precinct is of a low intensity and made up of 1-5 storey buildings which are sparsely distributed around the campuses of ECU, WA Police Academy and the North Metropolitan TAFE. The student housing located at the south of the ECU campus represents the most intense development.

Business

The area west of Joondalup Drive is comprised by predominantly large format retail, bulky goods and showrooms. Due to a lack of consolidation car parking dominates the landscape.

Residential

The existing residential areas abutting Yellagonga Regional Park present a fine grain of urban form, with traditional detached single and double storey dwellings. There are a number of apartment buildings situated in the JAC.



- - - JAC Boundary
- █ Primary Roads
- █ Secondary Roads
- Primary Activity Node
- Activity Node
- █ Open Space
- ▲ Entry Points
- - - Potential Green Link
- █ Barrier

Figure 37: JAC - Existing Urban Structure





7.1.1.2 EXISTING STREET NETWORK

A legible street network is important to enable efficient movement and permeability for vehicles and pedestrians/cyclists. Due to the size of the JAC the street network varies considerably, traditionally travel to and within the centre has been Perth-centric with majority of the movement occurring north-south along Joondalup Drive and Grand Boulevard. Streets are typically characterised by wide road reserves and are generally of good quality and consistent landscaping. The existing street network can be described as follows:

North of Shenton Avenue

Shenton Avenue is the primary east-west link in the northern portion of the JAC, it provides links to key north-south road alignments such as Joondalup Drive, McLarty Avenue, Grand Boulevard and Lakeside Drive forming large city blocks. The Department of Housing site is currently a barrier to east-west movement, however, future development of the site should improve the legibility and efficiency of the street network. The north-eastern corner of the JAC is comprised by predominantly residential land uses, it is supported by a modified grid network and finer grain of urban form.

Central - Shenton Avenue to Hodges Drive

The CCP has a traditional inner-city grid with large street blocks, however, connectivity between Joondalup Drive and Grand Boulevard is limited due to large barriers such as Lakeside Shopping Centre and the ECU Endowment Precinct. Collier Pass is the only existing east-west link (south of Shenton Avenue) between Joondalup Drive and Grand Boulevard. This results in inefficient movement and traffic problems on Joondalup Drive and Grand Boulevard.

South of Hodges Drive

Joondalup Drive is the primary movement corridor south of Hodges Drive, other key links include Lakeside Drive, Eddystone Avenue and Treetop Avenue.

In addition, large sites, such as Lakeside Shopping Centre, ECU and the JHC have private streets that are not part of the public realm and therefore do not contribute to the public street network, however, are nonetheless important links within the city-wide street network.

7.1.1.3 EXISTING OPEN SPACE NETWORK

Lake Joondalup and its landscape setting is a defining feature of the JAC and a differentiator to other activity centres which are surrounded by predominantly urban areas. The JAC features several parks Central Park at the heart of the City, Elcar Park in the business area to the west and Neil Hawkins Park, which is within Yellagonga Regional Park. This series of open spaces are currently disconnected, however, there is an opportunity to establish a green east-west link, through the heart of the CCP improving connections to Lake Joondalup.



Figure 38: Existing Movement Network



7.1.2 PROPOSED URBAN STRUCTURE

7.1.2.1 CONCEPT MASTER PLAN

The urban form objectives are derived from the Master Plan and the vision, opportunities and challenges identified in **Section 4.1**. The objectives guide the proposed urban structure and built form of the JACP:

Built Form

- a) Develop an active and attractive city centre characterised by an appropriately scaled built form that reflects the JACs status as the primary centre in the north-west sub-region.
- b) Encourage increased development intensity along transport corridors to frame the edges of the JAC.
- c) Encourage a built form response that is flexible and able to adapt to changing economic and social conditions.

Streetscapes

- a) Encourage buildings to have a strong relationship to the street optimising the physical and visual interaction between the built form and streetscapes, allowing density whilst maintaining a human scale.
- b) Stimulate activity through the activation of streetscapes and public spaces by encouraging active frontages and land uses at ground levels.

Public Spaces

- a) Promote a high-quality public realm that enhances the JACs character through an interconnected network of functional public spaces.
- b) Create an attractive city centre through the use of high-quality materials, street furniture, public art and retain existing vegetation where possible.

Points of Arrival

- a) Encourage landmark development sites at the JAC's gateways reinforcing entrance into the CCP and contributing to the city's character and identity.



- Activity Centre Plan Boundary
- Train Line
- T Train Station
- T Train Interchange
- P LRT stops
- LRT route
- Bus Priority
- Principal Shared Path
- Freeway to Lakec Connection
- Roads
- Built Form
- City Squares
- Multi Deck Parking
- Car Parking
- Open space
- } { Underpass

Figure 39: Joondalup Activity Centre Master Plan



7.1.2.2 LEGIBILITY

A strong, permeable and legible urban structure is a feature of great towns and cities regardless of their scale and location. Good urban structure provides appropriate and desirable locations for the wide range of different types of land uses found in major centres. Good urban structure also enables freedom of choice in how to get from one part of a city to another, and in a way which is understandable by residents and visitors alike.

Views and Vistas

The identity and sense of place of the JAC is derived, in part, from its proximity to Lake Joondalup and the Yellagonga Regional Park. If Joondalup is to retain its sense of place, it is important to identify key views and vistas to these natural assets and park space along the proposed east-west green connection (refer to JACP Map).

Therefore, the following views and vistas should be framed and emphasised by the creation of iconic buildings, urban walls with high quality streetscapes and extensive landscaping. Views to Lake Joondalup and the Yellagonga Regional Park must be maintained and enhanced. These key views include:

- + The vista along Grand Boulevard.
- + Views between the City and Lake Joondalup through the parkland structure.
- + Controlled vistas from Central Park.
- + Along Shenton Avenue to Yellagonga Regional Park.
- + From the intersection of Kendrew Crescent and Lakeside Drive to Lake Joondalup.

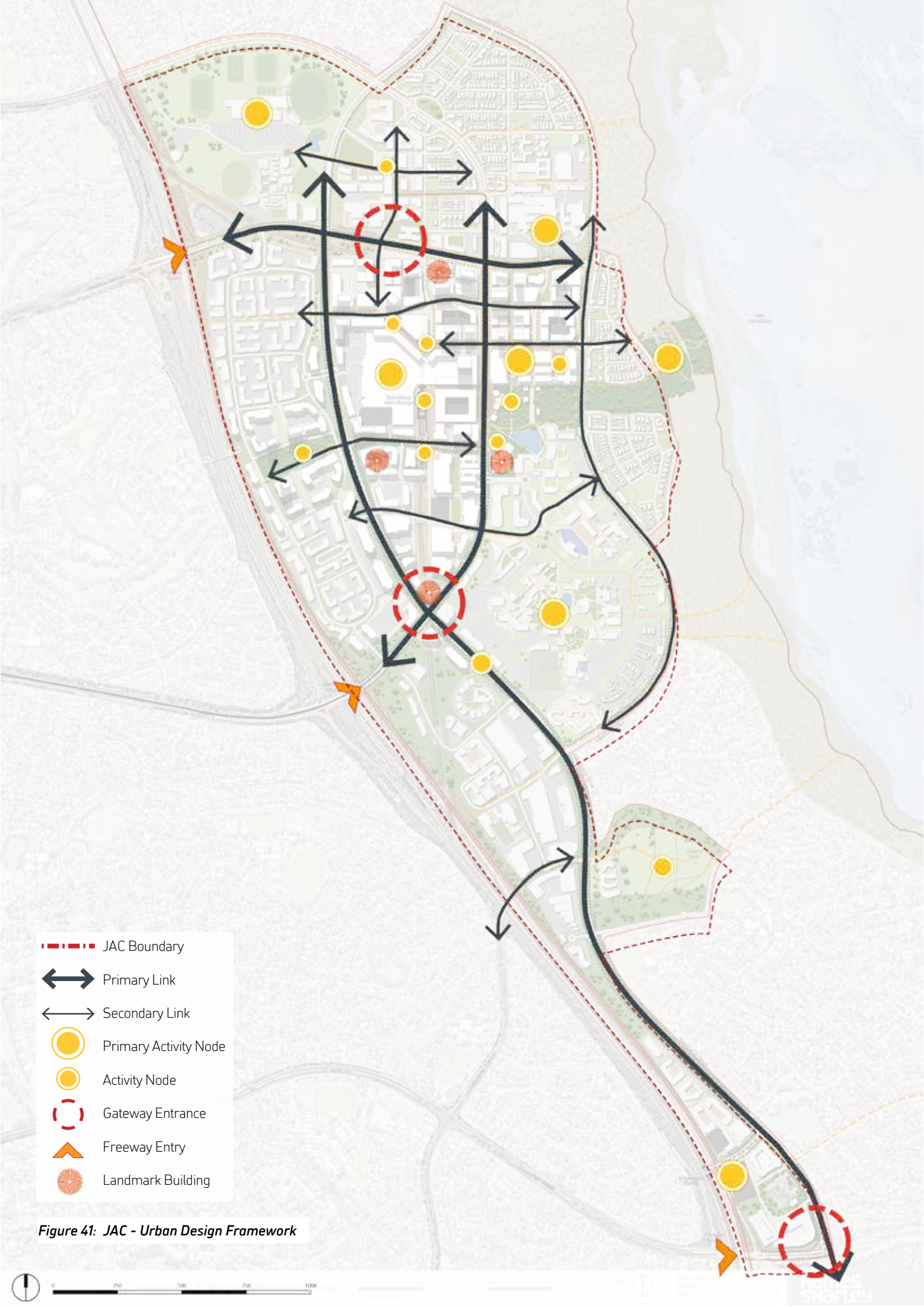
To preserve these key views, building setbacks may need to be increased to avoid blocking view corridors. Additional stepping back may also be required in tall buildings to preserve these views.

Landmark Sites

Landmark development sites and buildings will be coordinated with these key views and vistas. Such buildings are essential in providing orientation and wayfinding for residents and visitors to a city. They may be located at key arrival points and terminus' along vehicular or pedestrian paths of travel and should also be viewed from a distance. The JAC is currently lacking in such landmark buildings and the recent Edith Cowan Chancellery building stands out in the City for its remarkable built form.

7.1.2.3 SITE AMALGAMATION

In order to achieve the development standards intended by the Joondalup Activity Centre Master Plan and JACP, site amalgamations are encouraged, particularly in the CCP to overcome ownership challenges. Without site amalgamation, the scale and intensity of development in Joondalup will be substantially less than what is intended.



- JAC Boundary
- Primary Link
- Secondary Link
- Primary Activity Node
- Activity Node
- Gateway Entrance
- Freeway Entry
- Landmark Building

Figure 41: JAC - Urban Design Framework





7.2 BUILT FORM

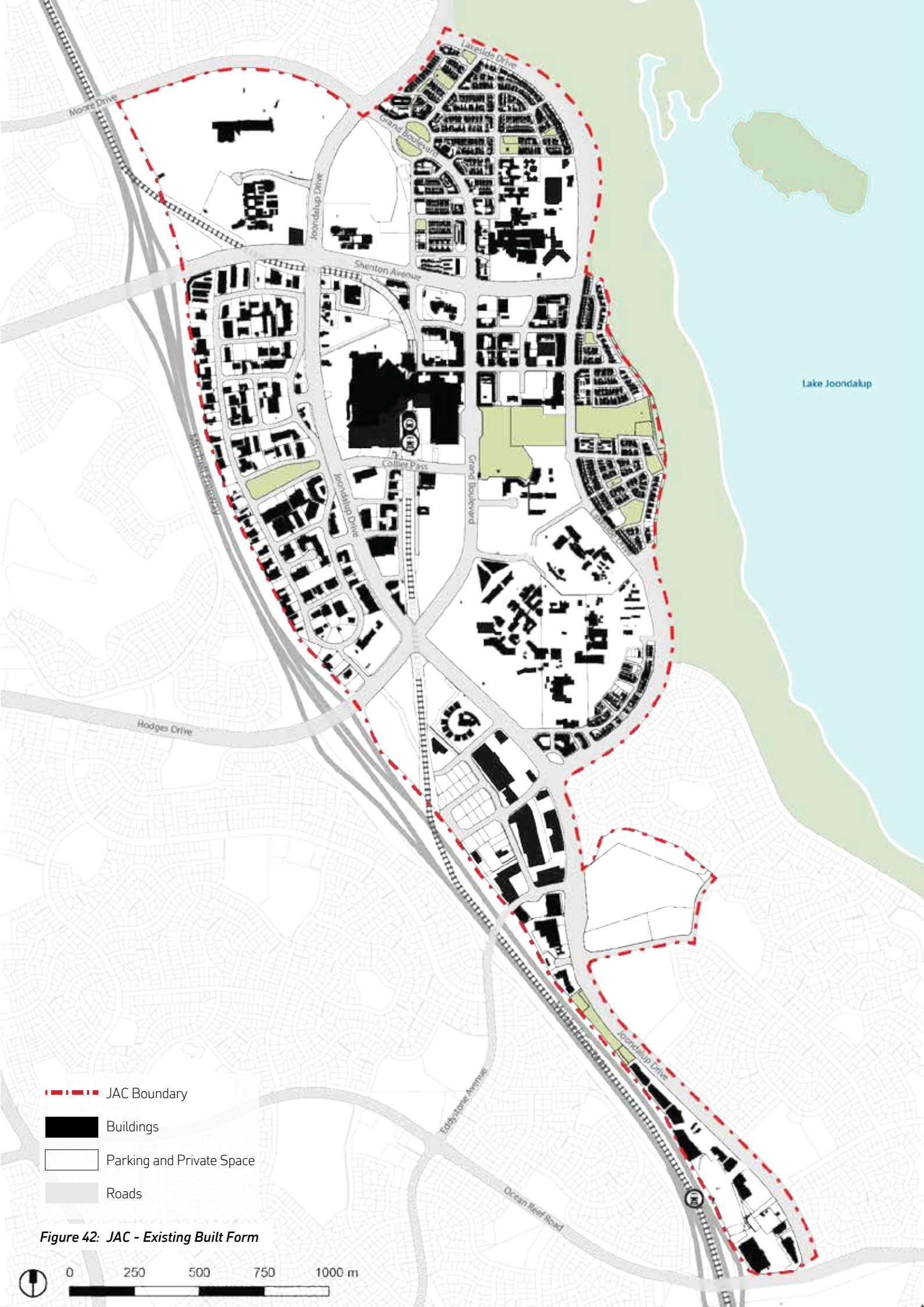
7.2.1 EXISTING BUILT FORM

The built form within the JAC varies across the city. The Joondalup City Centre Development Plan and Manual 1995 implemented a system of graded plot ratios to ensure the highest density of development occurred at the core of the JAC to enable a concentrated area of activity. This has resulted in the tallest buildings being located in the CCP which is characterised by one to four storey buildings, with one, five storey building. The area around Winton Road and Edgewater Train Station is characterised by single storey buildings with a large floor area while the University Campus contains a variety of clustered buildings with building heights ranging from one to three storeys.

There is a range in the quality of the existing buildings within the JAC, however, there are few landmark buildings or buildings with exemplar design with the possible exception of the administration building at ECU. The existing residential development is for the most part of a good standard and quality.

Apart from some larger sites for prime retail and institutional activities, most of the City's subdivision pattern is comprised of small lots, which provide a large number of smaller scale developments.





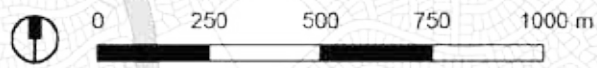
--- JAC Boundary

■ Buildings

□ Parking and Private Space

■ Roads

Figure 42: JAC - Existing Built Form





7.2.2 PROPOSED BUILT FORM

The quality of the experience in the JAC will be largely defined by the quality of its buildings, streets, and public spaces. A high standard of quality and design is essential to ensure that the Joondalup experience is a positive one. Good architecture and urban design employed in the short term will also set a benchmark for the community's expectation in the future.

Whilst the character and vitality of cities evolves over a long period of time, those investing in a new Joondalup need to be assured that certain qualities are established in the early stages of development. This is to ensure that civic design goals are constantly established and that private investment is safeguarded. A high value is placed on the quality of the design of all elements comprising the urban form, from public services infrastructure to the individual buildings and landscaping.

In the CCP, buildings should be built to the street alignment to reinforce the urban character and improve pedestrian amenity and activity at street level. Elements of taller buildings may need to be set back to provide for sunlight to streets, to offer comfortable wind conditions, maintain view corridors, an appropriate building scale for pedestrians, and good growing conditions for street trees.

The JAC is on the precipice of transition, the centre has experienced a period of sustained growth, however, the existing built form will not be suitable as the function and role of the JAC expands. The JACP supports a more intense urban form to what is currently in the JAC. The proposed urban form is based on the Urban Design Framework and Joondalup Activity Centre Master Plan and is supported by built form guidelines which address:

- + Building heights;
- + Setbacks; and
- + Street interfaces.

Future development of the JAC should have due regard for the General and Precinct Specific Development Standards in Part One - Implementation.



--- JAC Boundary

■ Buildings

□ Parking and Private Space

■ Roads

Figure 43: JAC - Proposed Built Form





7.2.3 PROPOSED BUILDING ENVELOPES

7.2.3.1 BUILDING HEIGHTS

Building height can reinforce an area's character or relate to community aspirations for an area's future character. Appropriate building height is derived from local context, street conditions and character objectives for an area. Although the most intensive development has occurred in the CCP, the desired scale of development has not been achieved. As such, the JACP reviews these development controls to effectively encourage a greater scale and intensity of built form in the CCP.

In regard to building height, it is important to consider whether taller buildings are appropriate, and if so, where and how high. There are a number of reasons to consider a greater concentration of activity in strategic locations within the JAC, as summarised below:

- + To promote and stimulate greater economic development within the CCP;
- + To better utilise scarce land resources;
- + To promote and stimulate a larger residential population which will contribute to greater levels of activity;
- + To encourage development of an appropriate scale in the CCP which contribute to the Joondalup skyline by promoting iconic buildings; and
- + To ensure a transition of building heights which contribute to the legibility of the JAC; that is tallest buildings within the City's core and low-rise buildings on the edge of the activity centre plan area.

Therefore the JACP proposes increased building heights across the JAC to reinforce increased density and intensity in the future urban structure. The JACP proposes an increase in height across the centre with no maximum and a minimum of 20.5m (5 storeys) proposed in the CCP. Increased building heights are proposed to support larger employment and residential populations in the JAC.

The building heights plan on **Figure 44** provides guidance for future development by supporting increased height and intensity where the greatest concentrations of activity will occur. The building heights for the JACP are responsive to existing movement networks, open space, the proposed built form and block and street patterns outlined in the Master Plan. Due to varying floor to floor requirements for residential (approximately 3m) and commercial (approximately 3.5m) land uses it is expected that buildings will vary the number of storeys provided.

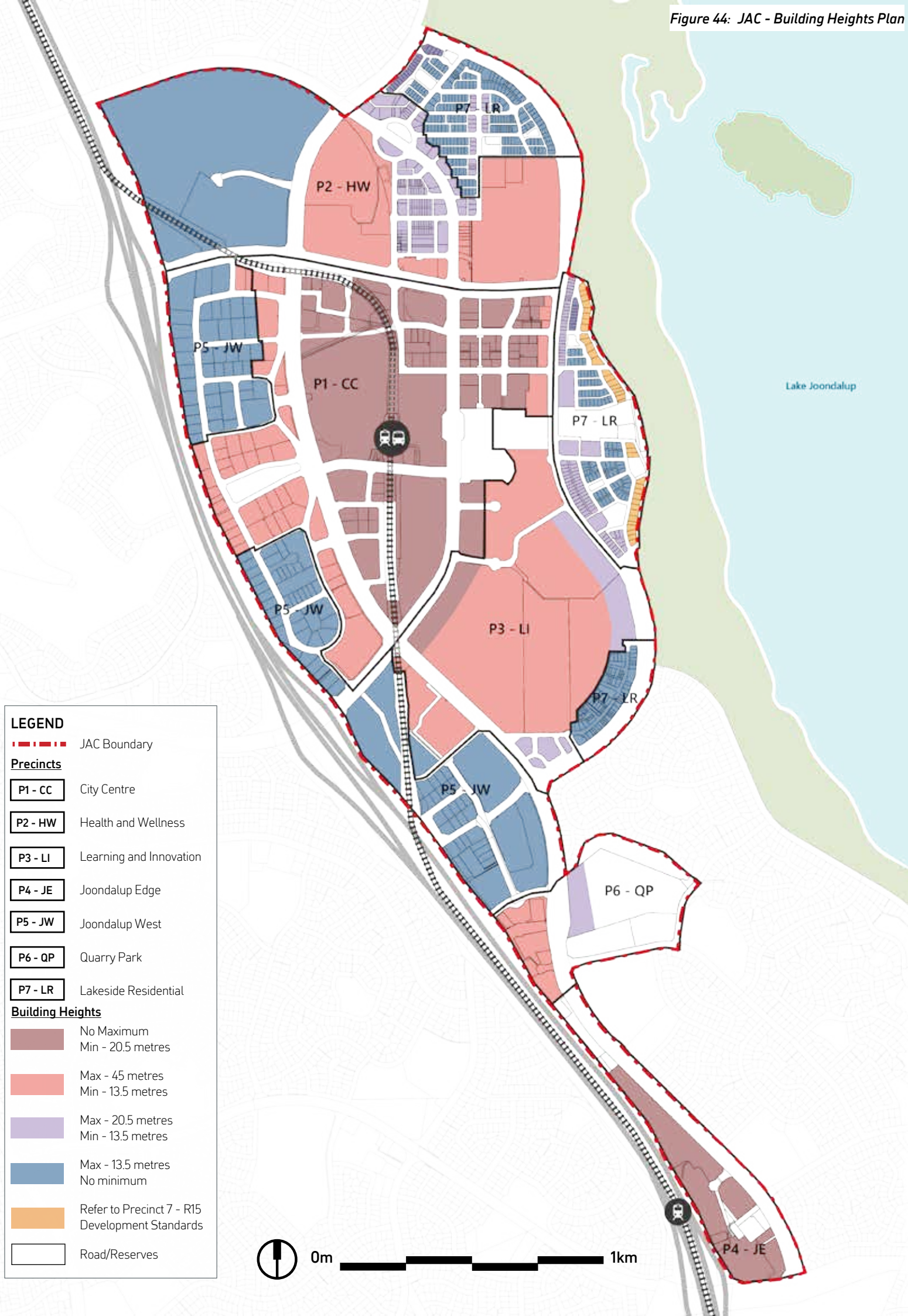
Building heights in the JAC are supported by the following key outcomes:

- + No height limits in the CCP to establish an intense concentration of mixed-use development to increase employment and residential populations; and
- + Provide a transition in height from the CCP to a finer grain closer to surrounding residential areas.

The development provisions of the JACP identify maximum heights, or no height limit in strategic locations. A height range is also stipulated for podiums to create an 'urban wall'; being the height of the building built along the street edge. Specifying minimum building and podium heights will ensure a benchmark is achieved and future building height opportunities are not lost as the result of approving lower-rise development that contributes little to the City's skyline and streetscape.

It is envisaged that the relaxation of parking requirements will assist in the development of taller buildings. The standards under the Joondalup City Centre Development Plan and Manual require a significant amount of parking, which due to development and construction costs could make any buildings of significant height economically unviable. By reducing the parking requirements in the JAC, it is hoped that taller buildings will be developed as the cost of providing car parking will be reduced.

Figure 44: JAC - Building Heights Plan



LEGEND

- JAC Boundary

Precincts

- P1 - CC City Centre
- P2 - HW Health and Wellness
- P3 - LI Learning and Innovation
- P4 - JE Joondalup Edge
- P5 - JW Joondalup West
- P6 - QP Quarry Park
- P7 - LR Lakeside Residential

Building Heights

- No Maximum
Min - 20.5 metres
- Max - 45 metres
Min - 13.5 metres
- Max - 20.5 metres
Min - 13.5 metres
- Max - 13.5 metres
No minimum
- Refer to Precinct 7 - R15
Development Standards
- Road/Reserves



7.2.3.2 TALL BUILDINGS

Tall buildings can be defined as buildings with height that is greater than the width of the adjacent street right of way. Towers shall be designed to address the following:

- + Minimise shadow impacts and negative wind conditions on surrounding streets and public realm;
- + Minimise loss of sky view;
- + Allow for natural light into interior spaces;
- + Visually diminish the scale and massing of buildings;
- + Provide greater tower separation, setbacks and stepbacks proportionate to increases in tower floor plate size and/or height.;
- + Locate towers away from streets, parks, open space and neighbouring properties to reduce visual and physical impacts of the tower on public realm;
- + Coordinate tower placement with other towers on the same street block to maintain solar access and sky views; and
- + Towers should be stepped back a minimum of 6 metres from the face of the base building.

It is permissible for a single corner of the tower to extend through the base building to the ground plane to assist in articulation of the building. The tower is still required to be setback the minimum distance to provide for a transition zone. Where such an instance occurs adjacent to a park or public space, this setback should be sufficient to avoid overshadowing and negative wind conditions.

Towers should be stepped back a minimum of 6 metres from the street frontage and side and rear property lines or centre line of an abutting lane. Towers on the same site should be separated by a distance of 12 metres or greater, measured from the exterior wall of the buildings, excluding balconies. Greater distances should be provided on larger sites and taller buildings. Sites that cannot accommodate these separation distances may not be suitable for tall buildings.

7.2.3.3 HEIGHT TRANSITION

The JAC consists of a range of development intensities and types. As the built form changes from the town centre to the surrounding single unit residential areas, techniques shall be applied to ensure a smooth transition. These include stepping heights, building setbacks and building stepbacks.

Taller buildings shall be located nearer the centre of the precinct and lower buildings around the edges as the built form transitions to less intense development. Height envelopes shall reflect the surrounding context, both existing and proposed, and the anticipated staging of development. The western border of the JAC abuts the Mitchell Freeway therefore there will be no disturbance of residential areas west of the Mitchell Freeway.

The potential impact of taller buildings will require further guidance in dealing specifically with:

- + Public and private amenity
- + Servicing
- + Viability of land use tenure
- + Overall building appearance
- + Building façade and street interface
- + Parking

The JACP sets out objectives and provisions to safeguard the quality of building form and development with regard to potential impacts, particularly at street level.

7.2.3.4 LANDMARK AND CORNER SITES

The JAC has the potential to establish clearly defined points of arrival or 'gateway' entrances. There are currently limited landmark buildings or points of arrival in the JAC and the recent Edith Cowan Chancellery building stands apart in the City for its remarkable built form. This is a result of the low density urban form and large road reserves/intersections.

A number of potential landmark development sites have been identified within JAC. These sites have been strategically selected based on the following criteria:

- + Situated on the corner of a major intersection;
- + Situated in a proposed entrance gateway.

Landmark sites contribute to the JACs character, assist with legibility and wayfinding and provide opportunities for high quality architectural design. They should address both vehicular travel and pedestrians and be visible from a distance. Part 1 of the Activity Centre Plan identifies key landmark sites which require tailored development controls to ensure quality built outcomes and memorable experiences for users of the City.



Figure 45: JAC - Indicative 3d Modelling



7.2.3.5 SETBACKS

The setback of buildings from a street edge affects how uses relate to the public space of the street. In the JAC, setbacks are intended to provide some variety among the built form to create a visually appealing and diverse urban environment. A variety of setbacks are encouraged throughout the JAC to encourage a diverse built form and street interface.

Nil Setbacks

Nil setbacks are proposed in the CCP to create an intense urban core. Where a nil setback is proposed it should apply for the street wall or podium levels of a building. Nil setbacks contribute to the pedestrian environment by providing a consistent street edge reinforcing integration between the built form and the public realm. They are intended to contribute to the public domain by enhancing streetscape character and the continuity of street façades through elements such as continuous awnings.

Residential Setbacks

When multiple residential development is located at ground level, a minimum setback of 3 metres is required to provide a sufficient transition between public and private. This setback area should be sufficiently landscaped to provide privacy for residents while preserving sightlines to the street for passive surveillance. Other forms of separation may be applied including grade separation.

Awnings and verandahs are encouraged where there is a nil setback to the street to reinforce the pedestrian environment and contribute to the desired inner city character.

To preserve key view corridors, building setbacks may need to be increased to avoid blocking view corridors. Additional stepping back may also be required in tall buildings to preserve these views.

Tower Structures

Tower buildings or elements should be setback from the street on a podium to maintain a pedestrian scale at the street. These setbacks also allow greater light access to the street and public realm. For towers exceeding particular heights these setbacks will also be required along side boundaries. Taller buildings without a podium create a dramatic urban form which may be permissible in suitable locations including landmark sites.

7.2.3.6 OCCUPANT COMFORT

The design of buildings and the spaces between them can have a direct positive, or negative, impact on the comfort and amenity of the building's occupants or the occupants of adjacent buildings. The JAC will diversify the residential alternatives available to residents of the north-west corridor by providing additional opportunities for city living.

A certain standard of occupant amenity is expected of all development which should take into account access to natural light, provision of private open space, visual privacy, and minimising exposure to nuisances such as noise and glare. Whilst residential development shall retain a degree of visual privacy, it is acknowledged that reduced privacy may be a condition of living within an inner city area, and that the high privacy standards afforded to suburban areas cannot be accommodated in a higher density urban environment.

The application of the R-AC 0 density code allows residential development to be in accordance with an adopted Structure Plan rather than the provisions of State Planning Policy 3.2 - Residential Design Codes (R-Codes). This allows the standards for car parking, open space, building setbacks and height, privacy, and overshadowing to be more flexible than those contained in the R-Codes.

The development provisions for each precinct provide specific guidance on the level of occupant amenity which is expected in differing areas of the JAC.

7.2.3.7 ARTICULATION

Articulation in buildings helps to reduce the appearance of building bulk while creating visual interest in the streetscape. The JACP encourages articulation in building elevations particularly where long or high walls are proposed. Such articulation may be achieved by the following methods:

- + Variety of high-quality durable materials;
- + Textures and colours;
- + Public art;
- + Variation in material planes with crafted detailing;
- + Openings and fenestration; and
- + Roof design.

Multi-storey parking decks with street elevations should be treated aesthetically with applications such as screening, artwork and green walls to reduce their visual impact.

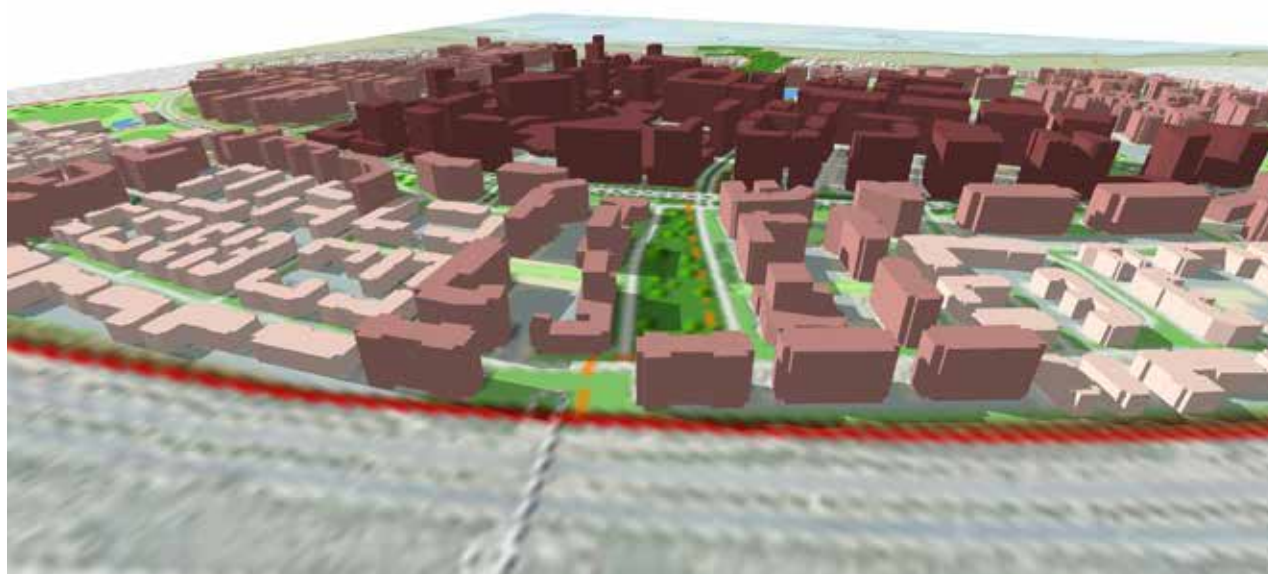


Figure 46: JAC - Indicative 3d Modelling



7.2.4 STREET INTERFACE

The interface of a building with the public realm (whether a street, city square or other public space) creates a strong and lasting impression of the quality of both the public space and the buildings that define it. This appearance from the public realm is commonly referred to as the streetscape, regardless of the type of adjacent public realm.

Furthermore, the street interface determines the way in which people relate to a building, enter it, and use it. The street interface also determines how a building's occupants relate to the public outside. In essence, the quality of the street interface is central to the way in which it allows people to use the urban environment, and therefore, the success of the city as a centre for human interaction is dependent on the success of the street interface.

7.2.4.1 URBAN WALL

The requirement for nil setbacks, podiums and tower stepbacks creates an 'urban wall' along the street interface. This urban wall preserves the pedestrian scale of streets irrespective of the height of towers located above. Urban walls define the edges of streets, parks and open space areas while also maintaining pedestrian access to sunlight and sky views.

Podium heights shall take into consideration the surrounding context, both existing and proposed, and the anticipating staging of redevelopment for neighbouring development. Where adjacent development is significantly lower and unlikely to redevelop in the short-term, a form of transition shall be provided.

7.2.4.2 STREET FRONTAGES

The existing street network in the JAC has a distinct character and the level of activation is varied dependent on location, land use and street type. The development provisions contained in the Activity Centre Plan provide specific guidance on how a development is expected to contribute to street interaction in differing areas of the JAC.

When considering building design, the orientation and location of street level activity and visual connections between internal areas of buildings and the adjacent public realm, all contribute to a sense of liveliness, creating interest and attractive public places. Edge treatments along important street interfaces and at key locations reinforce places of activity and other place-making outcomes. The way certain edges are treated will define the quality and character of streets and public spaces in the JAC.

Street interfaces are categorised into the following edge treatment groups:

Active Frontage

Active edges provide the most intensive activity, they are located on the primary pedestrian corridors. An active edge is one where the built form abuts the public realm, contributing to the character of the JAC by creating strong visual and physical connections between buildings and public spaces. Making frontages 'active' adds interest, life and vitality to the public realm. Ground floor land uses generate pedestrian activity and should include retail and entertainment land uses that spill out on to the street (e.g. alfresco dining). The proposed city squares should also be framed by active frontages. Vehicle access and the number of crossovers should be limited where possible.

To promote activity and vibrancy along key 'active' streets, land uses at street level shall include primarily retail and dining. Where lobbies are located to access office space located above, the width shall be limited. Large scale commercial spaces shall be located towards the building interior and sleeved with more active uses.

Semi-Active Frontage

Semi-active edges provide frontages with varying levels of activation, these frontages should seek to provide semi-active ground floor uses, however, they should not detract from primary areas of activity in the CCP. Buildings should be articulated toward the street as building entrances are important points of activity for residential and commercial buildings, they should be located at the ground floor street frontage.

Other Frontages

Other frontage types throughout the JAC include:

Passive frontages - which occur where office and residential land uses are provided on the ground floor. These edges shall ensure that buildings and their entrances are articulated toward the street providing a strong urban character. While these streets may not exhibit the same vibrancy of the active main street and surrounding pedestrian focused street network, there remains a strong urban character. The JACP does not preclude active land uses within these areas as they can provide focal points and areas of interest within the precincts. However, it is important to maintain the focus of activity on the key active streets; and

Attractive frontages - which can be used to improve the visual appearance of non-active frontages such as blank walls, service edges and car parks. They can provide visual interest and appeal through high-quality materials, artwork, screens or landscaping.

In the CCP along 'active' street edges, the ground floor is required to be a minimum height of 4.5 metres. This height provides for the immediate activation of the adjacent street or a longer term transition to a more active land use.

7.2.4.3 BACK OF HOUSE AREAS

Back of house areas including service, loading, utilities and vehicle parking shall be located away from the public realm and view whenever possible. These areas shall be screened, below ground or within the building mass as specified in the General Development Standards.



7.3 Public Realm

High quality public spaces will contribute to the City's role as a lively place, not just during work hours, but in the evenings and during the weekends. This includes attracting local residents and visitors as active participants in the city's life and will:

- + Contribute positively to the economic viability of the City.
- + Enhance liveability, diversity and inclusion through access to a range of activities for all residents and visitors.
- + Provide venues for public entertainment and temporary events – markets, theatre, busking, exhibitions, site specific artworks and local festivals and celebrations.
- + Enhance the cultural tourism potential of the City.
- + Provide a safer environment through passive surveillance.

7.3.1 GREEN SPACES

Central Park and Elcar Park are the key open space areas in the JAC. Re-establishing links to Neil Hawkins Park and Lake Joondalup will enhance the landscape character by creating an east-west green spine (along Collier Pass).

Key opportunities to enhance the landscape identity for the JAC include:

- + Neil Hawkins Park enhanced as the primary focus of activity at Lake Joondalup.
- + An east-west green spine along Collier Pass, in line with the original landscape intent for the city, linking through Central Park to Neil Hawkins Park and Lake Joondalup.
- + Strengthened links to Lake Joondalup through enhanced east-west pedestrian and cycle routes.
- + Clearly articulated landscape identity with high quality public realm and streetscape treatments that provide variety, activity, interaction and comfort;
- + City edges and gateways reinforcing the landscape identity of Joondalup and providing a unique welcome to the City.

7.3.2 URBAN SPACES

To redefine the city as a place that offers identity, variety and activity, a network of city squares is proposed.

The squares are illustrated on **Figure 48**, they are located at:

- + Collier Pass (south side) as part of the Mobility Hub;
- + Central Park at the future Performing Arts Centre (eastern end of Collier Pass);
- + Intersection of Boas Avenue and Central Walk (southern side of Boas Avenue);
- + Boas Avenue (adjacent Library);
- + McLarty Avenue/Boas Ave (corner at Lakeside Shopping Centre); and
- + Reid Promenade (new link between Grand Boulevard and Joondalup Drive).

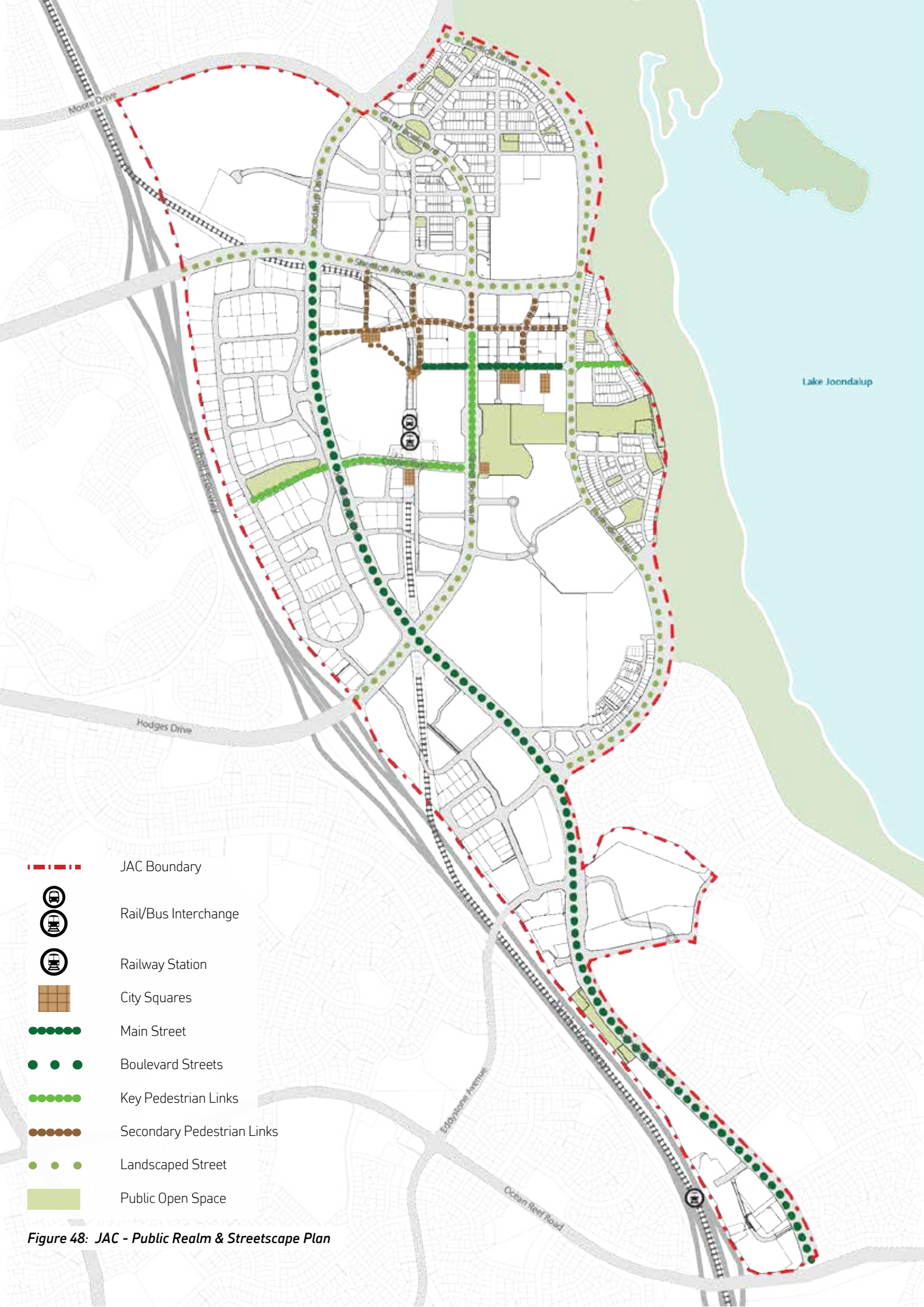


Figure 48: JAC - Public Realm & Streetscape Plan



While each square will have a different function, they will all be:

- + IDENTIFIABLE: Clear purpose and character
- + CONNECTED: Part of a 'place network'
- + ACTIVE: Edges and attractors
- + WELCOMING: Inclusive and comfortable
- + FLEXIBLE: Intimate and event scale, the City's "living room"
- + MANAGED: buildings and place partnerships

Key opportunities of the city squares are:

- + A 'charm-bracelet' of places within the CCP providing variety, identity and legibility for Joondalup, establishing opportunities for social interaction;
- + A lively and active CCP focused on the central spine of Boas Avenue, which generates activity at all times of the day through activities such as, cafés, restaurants, small bars and niche retail offering;
- + Enhanced connectivity to Joondalup Station improves pedestrian connectivity along Collier Pass and Boas Avenue, strengthened by high quality streetscapes; and
- + Central Park is activated through temporal and permanent uses.

7.3.3 PEDESTRIAN MOVEMENT, SAFETY AND AMENITY

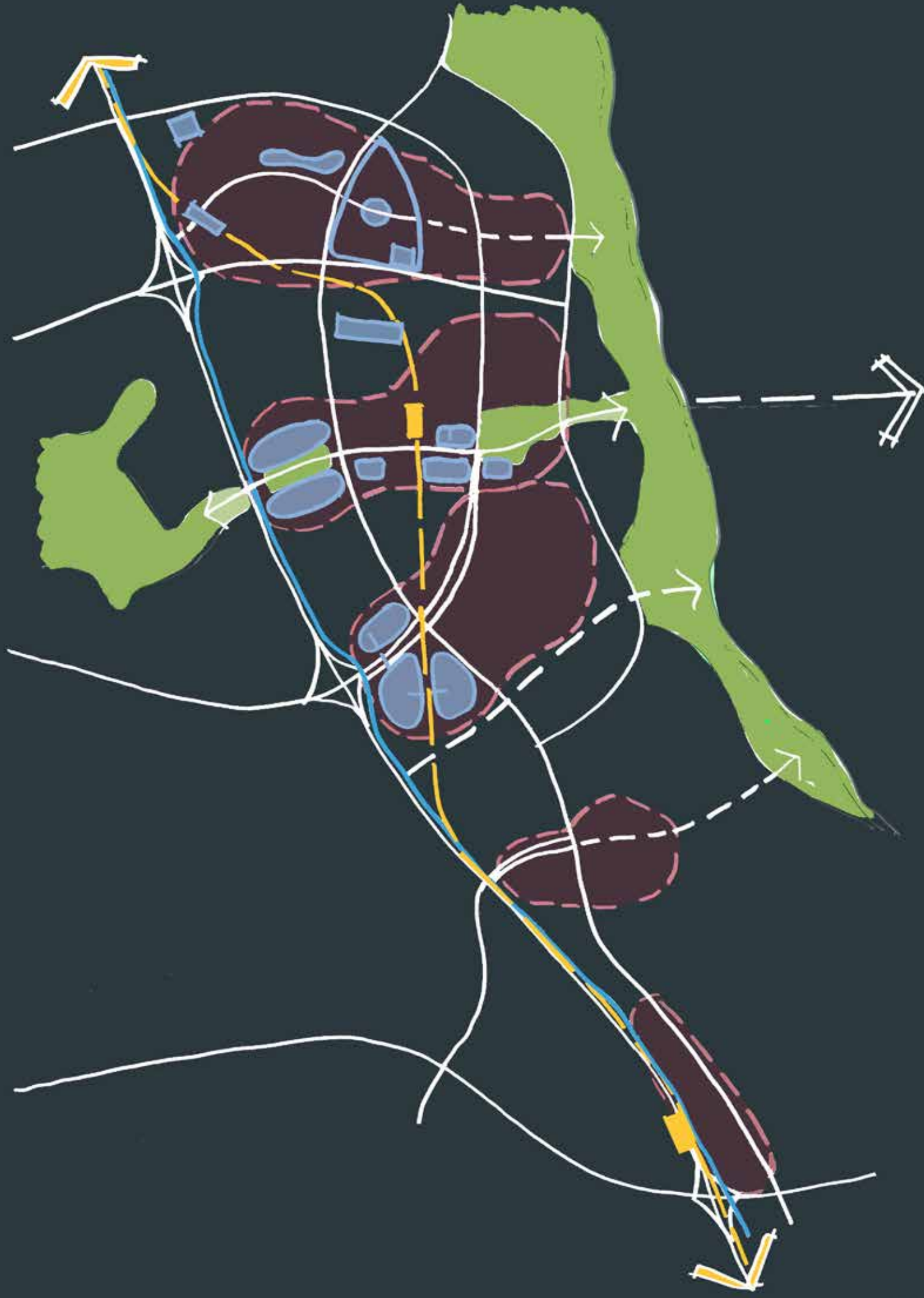
An urban environment, as opposed to a suburban environment, has a high level of pedestrian movement and street activity. To achieve this, the urban environment should be safe, functional and accessible for pedestrians of all levels of mobility. This includes provision of pedestrian shelter through the use of verandahs and awnings.

7.3.4 LANDSCAPE

Landscape is a highly valued element within the urban environment that not only provides a visual setting for the built environment but plays a role in modifying the micro-climate for users and reducing the heat island effect.

Key opportunities for landscape in the JAC include:

- + Enhance and establish tree lined boulevards that provide legibility and reinforce major routes through the JAC.
- + Encourage extensive landscape along streets and key pedestrian routes to create a vibrant, attractive and comfortable environment.
- + Encourage landscape within private development including green roofs and walls to soften urban setting.





7.4 Precinct Form and Character

The precincts are illustrated on **Figure 5** and have been formulated to promote and control development in the JAC. **Part One** of the JACP outlines precinct specific development standards for development aspects such as land use, building height and setbacks. This section provides an overview of the desired intent, objectives and initiatives proposed for each of the JAC precincts.

The precincts are summarised as follows:

- + City Centre;
- + Health and Wellness
- + Learning and Innovation;
- + Joondalup Edge;
- + Joondalup West;
- + Quarry Park; and
- + Lakeside Residential.

7.4.1 PRECINCT 1 - CITY CENTRE

7.4.1.1 PRECINCT INTENT

The CCP is recognised as the heart of the JAC. It will continue to be the focus for retail, commercial and entertainment land uses. The built form will reflect that of an intense urban centre with a focus on site amalgamation and redevelopment to enable greater intensification of the central core. The CCP is the primary location for generating an increased employment and residential population in the JAC.

The urban form in the CCP will reflect that of an intense urban core. There is no height limit in the central core and a number of landmark sites have been identified. Taller buildings and tower elements will be setback from the street alignment to retain a pedestrian scale at the street level. The built form will be underpinned by high quality design which is encouraged through development controls that enable flexibility.

Movement within and to the CCP will be improved by extending Reid Promenade and Kendrew Crescent to improve east-west movement, creating a city grid. The precinct will have street-based activity enhanced by activated frontages which are supported by an identifiable network of city squares that offer a variety of experiences and activities at all times of the day and night. The city squares will be connected by direct and attractive pedestrian routes linking public transport with the entertainment precinct and Lake Joondalup. A Mobility Hub will be established at the Collier Pass Square providing access for cyclists and pedestrians to the Joondalup Train and Bus Stations.

Distinctive 'gateways' will be created at the Joondalup Drive-Hodges Drive and Shenton Avenue-Lawley Court intersections to 'announce' arrival into JAC, enhancing the character and improving legibility.

7.4.1.2 PRECINCT OBJECTIVES

- a) Encourage the highest intensity of mixed use development and the greatest concentration of employment intensive land uses.
- b) Support mixed-use development along Joondalup Drive and Grand Boulevard to form intense inner-city development corridors.
- c) Establish the Joondalup Drive/Grand Boulevard and Shenton Avenue/Grand Boulevard intersections as the primary gateways into the CCP.
- d) Improve connectivity from Joondalup Train / Bus Stations to surrounding precincts.
- e) Establish a local mobility hub at the Collier Pass city square to improve connectivity between Joondalup Train Station and other precincts within the JAC.
- f) Establish a series of interconnected, functional and unique squares that form part of an integrated pedestrian network.
- g) Provide car parking in negotiation with Lakeside Shopping Centre as the major trip generator in the CCP.
- h) Reinforce Central Walk (north-south) and Boas Avenue (east-west) as the primary pedestrian spines by activating buildings at ground floor uses.
- i) Encourage the amalgamation of smaller lots into larger parcels to optimise redevelopment potential.



7.4.1.3 **PRECINCT INITIATIVES**

Activity

- + Establish a series of interconnected, functional and unique city squares that form part of an integrated pedestrian network.
- + Diversify the CCP by strengthening activity along Boas Avenue between Lake Joondalup and Lakeside Shopping Centre.
- + Encourage niche/specialist retailing opportunities along Central Walk and Boas Avenue.
- + Activate Central Walk through the provision of collaborative work spaces / art studios e.g. Spacecubed.
- + McLarty Avenue to develop as a restaurant strip, improving the integration and connectedness of Lakeside Shopping Centre with surrounding areas in the CCP.
- + Facilitate pop-up bars, cafés and restaurants to enhance vibrancy and vitality. Subsidised rents can be used to attract tenants.
- + Diversify JAC employment through increasing commercial office space.
- + Activate Central Park through a mix of temporal and permanent uses.

Movement

Pedestrian / Cyclist

- + Create an “enhanced grid network” to enable greater pedestrian permeability throughout the City and through Lakeside Shopping Centre.
- + Collier Pass to become an intermodal green link with a focus on public transport and an enhanced pedestrian and cycle environment.
- + Central Walk is reinforced as the primary north-south pedestrian spine between Joondalup Health Campus and Central Park.
- + Provide cycle infrastructure to support east-west connectivity to Lake Joondalup through the City.
- + Provide pedestrian refuge islands at non-signalised intersections.

Vehicle

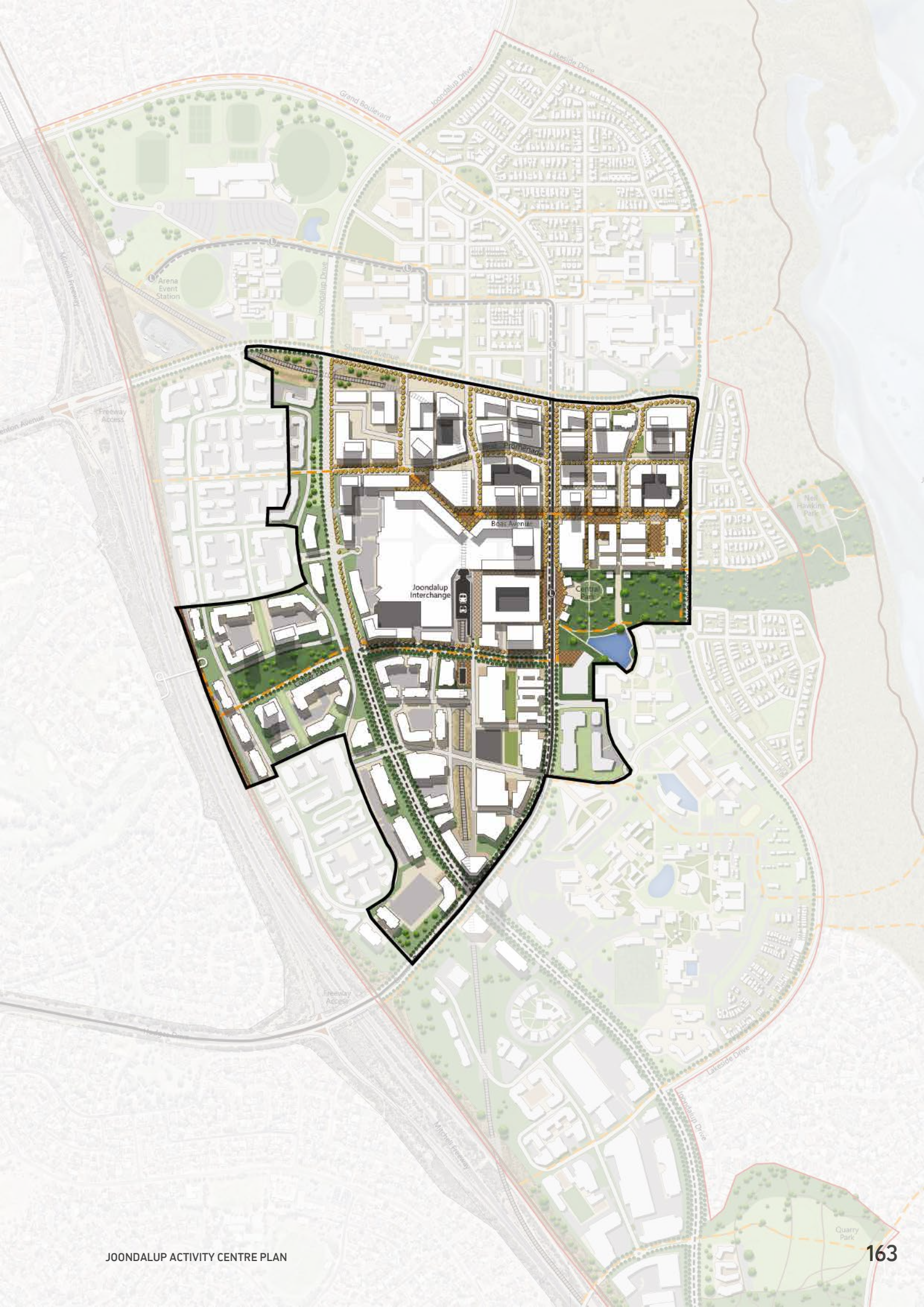
- + Reduce vehicle speeds on Joondalup Drive and Grand Boulevard prioritising pedestrian and cyclist movement.
- + Reid Promenade to be extended to Joondalup Drive (left in, left out) improving east-west connectivity.
- + Remove off-street parking slip lanes from Grand Boulevard to prioritise the pedestrian experience, creating potential for development along the street frontage.
- + Identify key locations for public parking on the periphery of the CCP and encourage shared parking.

Public Transport

- + Establish an integrated Mobility Hub in the CCP by extending Joondalup Station platform southward under Collier Pass to enable pedestrian and cyclist access to south side of Collier Pass.

Urban Form

- + A distinctive entry statement at the intersection of Joondalup Drive and Grand Boulevard will herald arrival in the maturing CCP with an urban street character.
- + Improve the intensity, diversity and quality of the built form, providing activity at ground level to improve the interaction between the built form and the public realm.
- + Landscape will be consistent with the original intent of a ‘city in landscape’ using a mixture of native and exotic species.
- + Public spaces and streets will be designed to support the evolving city as a destination for emerging business and future ways of engaging with people both as a commercial city and a community place.





7.4.2 PRECINCT 2 - HEALTH & WELLNESS

7.4.2.1 *PRECINCT INTENT*

The Health and Wellness Precinct is situated in the northern portion of the JAC. It includes the Joondalup Health Campus, Joondalup Arena, North Metropolitan TAFE (north campus) and Lake Joondalup Baptist College. It is the focus for health related land uses and it is envisioned that the Joondalup Health Campus will develop into a tertiary hospital, including research and regional health services. The precinct will continue to offer a range of ancillary health related services that will benefit from their proximity to the hospital and enable greater efficiency for staff and patients.

The precinct will transition into a more intense urban form underpinned by development of the existing Department of Housing site (between Joondalup Drive and McLarty Avenue), which is earmarked for high density residential and mixed-use development. There is also significant potential to increase development intensity along the existing McLarty Avenue, Grand Boulevard and proposed Lawley Court north-south corridors framing the northern entry into the CCP. The built form will be encouraged to be built to the boundary to address street frontages and the public realm.

The extension of Queensbury Road, Pimlico Place and Hammersmith Court within the Department of Housing redevelopment will improve permeability by creating a city grid, strengthening east-west linkages between the Joondalup Health Campus and Joondalup Arena / Lake Joondalup Baptist College.

7.4.2.2 *PRECINCT OBJECTIVES*

- a) Establish Shenton Avenue as the northern gateway entrance to JAC and as a multi-modal east-west connection linking Joondalup Arena and Joondalup Health Campus.
- b) Encourage more intense development on both sides of Joondalup Drive and Grand Boulevard.
- c) Improve connectivity between Joondalup Arena and Joondalup Health Campus by encouraging increased intensity and residential density on the Department of Housing site.
- d) Establish Kennedy Drive as an east-west connector with a focus on public transport.
- e) Provide parking in negotiation with Joondalup Health Campus as the primary trip generator.

7.4.2.3 *PRECINCT INITIATIVES*

Activity

- + Delivery of a high-density mixed use development on the Department of Housing site.
- + North Metropolitan TAFE to integrate with residential mixed use precinct, creating an active local main street environment on Lawley Court.
- + Joondalup Health Campus continues to grow into a Tertiary Hospital expanding hospital operations and health research providing knowledge based employment opportunities.
- + Commercial development in close proximity to the hospital to provide ancillary services and consulting offices.
- + Arena Joondalup to expand sporting facilities.

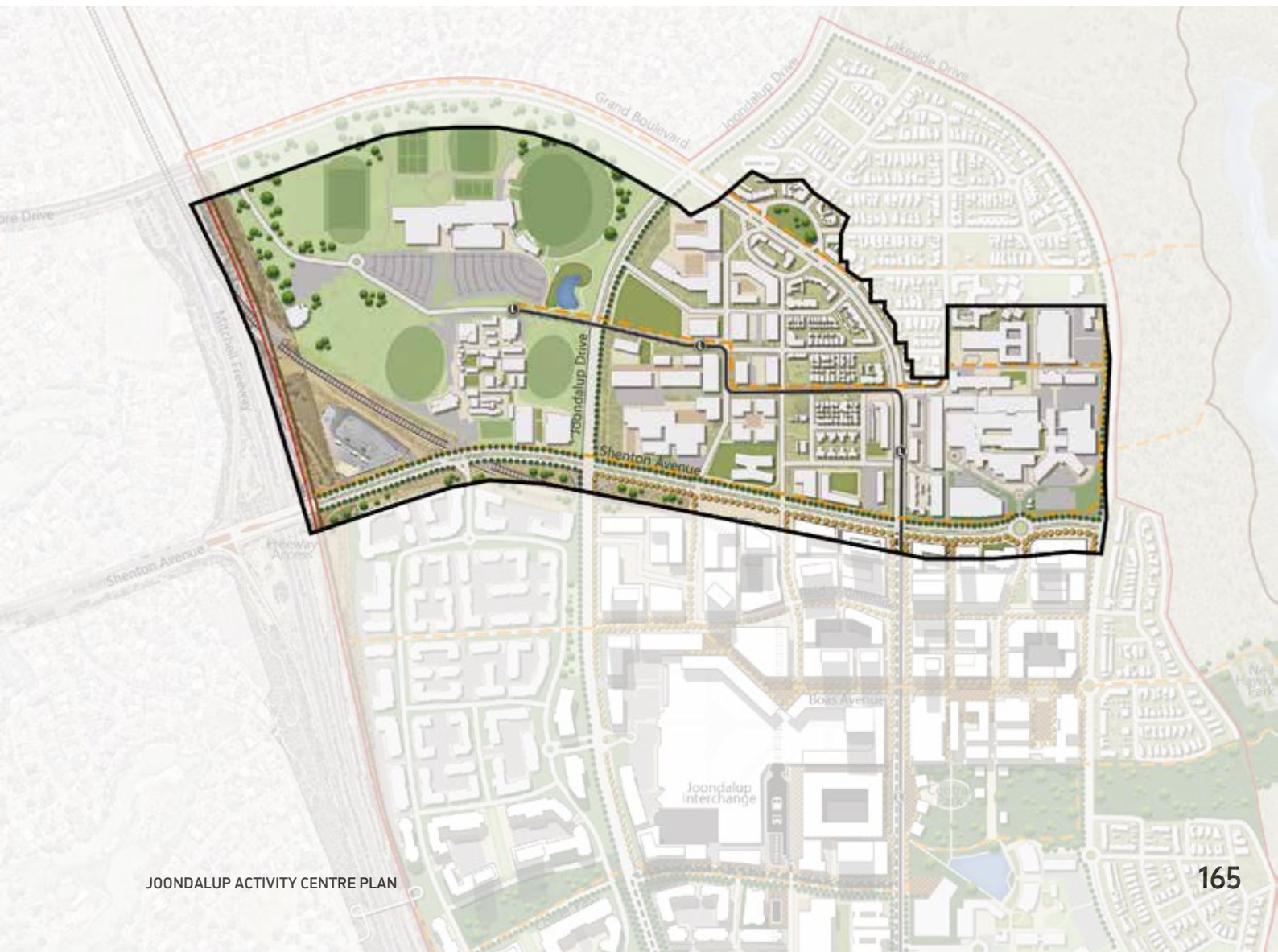
Movement

- + Shenton Avenue freeway exit to become a major gateway to JAC north. Freeway signs direct traffic to use Shenton Avenue as a primary entrance to Joondalup for access to the Joondalup Health Campus, Arena and Lakeside Joondalup Shopping Centre.
- + Shenton Avenue established as a multi-modal east-west connection including access from the existing principal shared path to Lake Joondalup.
- + Moore Drive to provide east-west connection. Cycle and walk – primarily from principal shared path to Lake Joondalup.

- + New 4-way signalled intersection at Kennedy/Joondalup Drive intersection to facilitate BRT and LRT movements east-west between Joondalup Drive and Grand Boulevard.
- + New Local Rapid Transport route will integrate land uses at:
 - Joondalup Arena
 - Department of Housing / North Metropolitan TAFE site
 - Joondalup Health Campus
- + Potential for an events train station to be provided at the Arena.
- + Narrow Shenton Avenue east of Lawley Court.

Urban Form

- + Seamlessly integrate the Department of Housing development and North Metropolitan TAFE sites into the city environment as part of the Health and Wellness precinct.
- + Support increased building heights and development intensity along key movement corridors.
- + Encourage the built form to address the street interface and public realm.
- + Land mark development site on the corner of McLarty Avenue and Shenton Avenue.
- + Transition the built form north of Shenton Avenue into a finer grain that is consistent with the Lakeside Residential Precinct.





7.4.3 PRECINCT 3 - LEARNING AND INNOVATION

7.4.3.1 PRECINCT INTENT

The Learning and Innovation Precinct attracts a broad mix of industry partners that integrate with the existing learning precinct through digital, physical and knowledge linkages. The precinct provides a platform to stimulate knowledge based employment and innovation.

The Learning and Innovation Precinct will form part of an important corridor along Grand Boulevard. The built form will be built closer to the street alignment providing an improved interface and framing the southern entrance into the CCP. Development will be encouraged along Grand Boulevard and Joondalup Drive to enhance the street presence, particularly on the vacant land within the North Metropolitan TAFE site between Teakle Court and Kendrew Crescent. The ECU campus will be characterised by campus style development including student housing along Lakeside Drive in the south and east.

Vehicular movement will be improved through the extension of Kendrew Crescent across Grand Boulevard providing east-west access to Joondalup Drive. Bus priority lanes will be provided along Joondalup Drive improving bus access from the south (and Edgewater Train Station), pedestrian and cyclist movement through the ECU campus will be encouraged on University Drive.

7.4.3.2 PRECINCT OBJECTIVES

- a) Enhance pedestrian and cyclist linkages through ECU to strengthen east-west movement from the principal shared path to Lake Joondalup.
- b) Encourage residential development on Lakeside Drive to provide a transition in built form that is in keeping with the local context.

7.4.3.3 PRECINCT INITIATIVES

Activity

- + Commercial development focussed on Grand Boulevard and Joondalup Drive.
- + Student Housing along fringe of ECU campus at Joondalup Drive.
 - ECU Continue to offer learning as principal activity
 - Police Complex to remain in current form – no growth/change
 - LandCorp site
- + MITA site developed as a public engagement interface for the university and research activities.

Movement

- + Provide east-west linkages from the principal shared path through the ECU campus along University Drive to Lake Joondalup.
- + Construct a pedestrian underpass to improve connectivity of the learning precinct across Joondalup Drive.
- + Connection under Hodges Drive to connect with the Joondalup West Precinct.
- + Bus Priority lanes along Joondalup Drive.
- + Kendrew Crescent will be extended across Grand Boulevard through the existing ECU endowment precinct to Joondalup Drive. Teakle Court will be realigned concurrently.

Urban Form

- + Create an appropriate urban edge to Grand Boulevard and Joondalup Drive.
- + Celebrate the City's intent to support learning and innovation through a distinct and dynamic entry at the intersection of Joondalup Drive and Grand Boulevard.
- + Increased development scale and intensity along Joondalup Drive and Grand Boulevard.
- + This precinct should portray aspirations to look to the future and to promote networks and new ways of working and learning to support and attract new and emerging economies.
- + Collaborate with ECU to develop a distinct theme for this precinct that will enable the campus to merge with the city as it extends southward.





7.4.4 PRECINCT 4 - JOONDALUP EDGE

7.4.4.1 PRECINCT INTENT

Joondalup Edge will focus on transport land use integration by providing intense development within the 400m walkable catchment of the Edgewater Train Station. The high density redevelopment will offer a mix of residential and supporting retail/commercial land uses. Ground floor uses will activate the precinct at all times of the day and night, and facilitate coordinated redevelopment of the existing large format retail uses to an active and diverse precinct.

The precinct is the southern gateway into the JAC and opportunities for development on the corner of Joondalup Road and Ocean Reef Road to create an entry statement into the JAC. The precinct will be connected to other precincts via Edgewater Train Station and bus priority lanes along Joondalup Drive.

7.4.4.2 PRECINCT OBJECTIVES

- a) Provide intense mixed-use development in close proximity to Edgewater Train Station, consistent with transit oriented development principles.
- b) Establish southern gateway entrance at intersection of Joondalup Drive and Ocean Reef Road.
- c) Provide consolidated public car parking to leverage off existing capacity.
- d) Improve pedestrian connectivity across Joondalup Drive between Edgewater Train Station and surrounding residential areas.

7.4.4.3 PRECINCT INITIATIVES

Activity

- + High intensity mixed-use development around Edgewater Station with a focus on improving land use diversity and maximising the potential for apartments in close proximity to the train station and integrate access to the PSP into the public realm.
- + Precinct to deliver a significant component of residential density target (SPP4.2).
- + Encourage active frontages along George Grey Place.

Movement

- + Bus priority lanes to be established along Joondalup Drive improving linkages between Joondalup Edge and the CCP.
- + Emphasise links to Edgewater Train Station, particularly between Joondalup Drive and Station.

Urban Form

- + Create a TOD 'main street' between Edgewater Train Station and Joondalup Drive providing convenience retail and services for the local community and train commuters which is lively at all times, safe and has a distinct character.
- + Optimise the opportunity for exposure to Ocean Reef Road with location of retail and commercial activity to the southern portion of the precinct.
- + Create a southern gateway at the intersection of Ocean Reef Road and Joondalup Drive, announcing entry into the JAC.
- + Limit the impact of the substation through landscaped design and screening elements.



Joondalup Interchange

Centre

Joondalup Drive

Freeway Access

Witchamper Freeway

Lakeside Drive

Joondalup Drive

Quarry Park

Ebbystone Avenue

Ocean Reef Road

Edgewater Station

Freeway Access

Ocean Reef Road



7.4.5 PRECINCT 5 - JOONDALUP WEST

7.4.5.1 *PRECINCT INTENT*

The Joondalup West Precinct is comprised of existing large format retail, bulky goods and commercial land uses. The intent of the precinct is to contribute to land use diversity by enabling developments with larger floor space requirements.

7.4.5.2 *PRECINCT OBJECTIVES*

- a) Provide a location for businesses with larger floor space requirements such as showrooms and bulky goods premises which complement the JAC.

7.4.5.3 *PRECINCT INITIATIVES*

Activity

- + Focus large format retail and bulky goods in the southern portion of the precinct as redevelopment potential is limited.
- + Small scale commercial office developed in the precinct to capitalise on proximity to public transport and support activity in the CCP.
- + Support a diversity of land uses within the precinct by enabling small scale office and retail (limited to 200m² NLA per development site).

Movement

- + New vehicle overpass from Injune Way to provide a crossing over the rail line. Potential for the new road to include an underpass, under Hodges Drive providing a connection to Buick Way.

Urban Form

- + Character to be reflective of a high quality business park environment.





7.4.6 PRECINCT 6 - QUARRY PARK

7.4.6.1 *PRECINCT INTENT*

Quarry Park Precinct is situated on the Joondalup Drive corridor. It will function as a mixed use precinct with retail west of Joondalup Drive and residential to the east with the increased intensity on both sides of Joondalup Drive. The Edgewater Quarry site offers an opportunity to create a unique and sustainable living precinct that pushes the boundaries of urban development to deliver a benchmark sustainable community in the distinctive quarry setting. The precinct is a demonstration of inner city living/diverse housing in landscape and emphasising the natural environment.

7.4.6.2 *PRECINCT OBJECTIVES*

- a) Support development on both sides of the Joondalup Drive interface.
- b) Provide multi-residential development on the existing Edgewater Quarry site that is a benchmark for sustainable development.

7.4.6.3 *PRECINCT INITIATIVES*

Activity

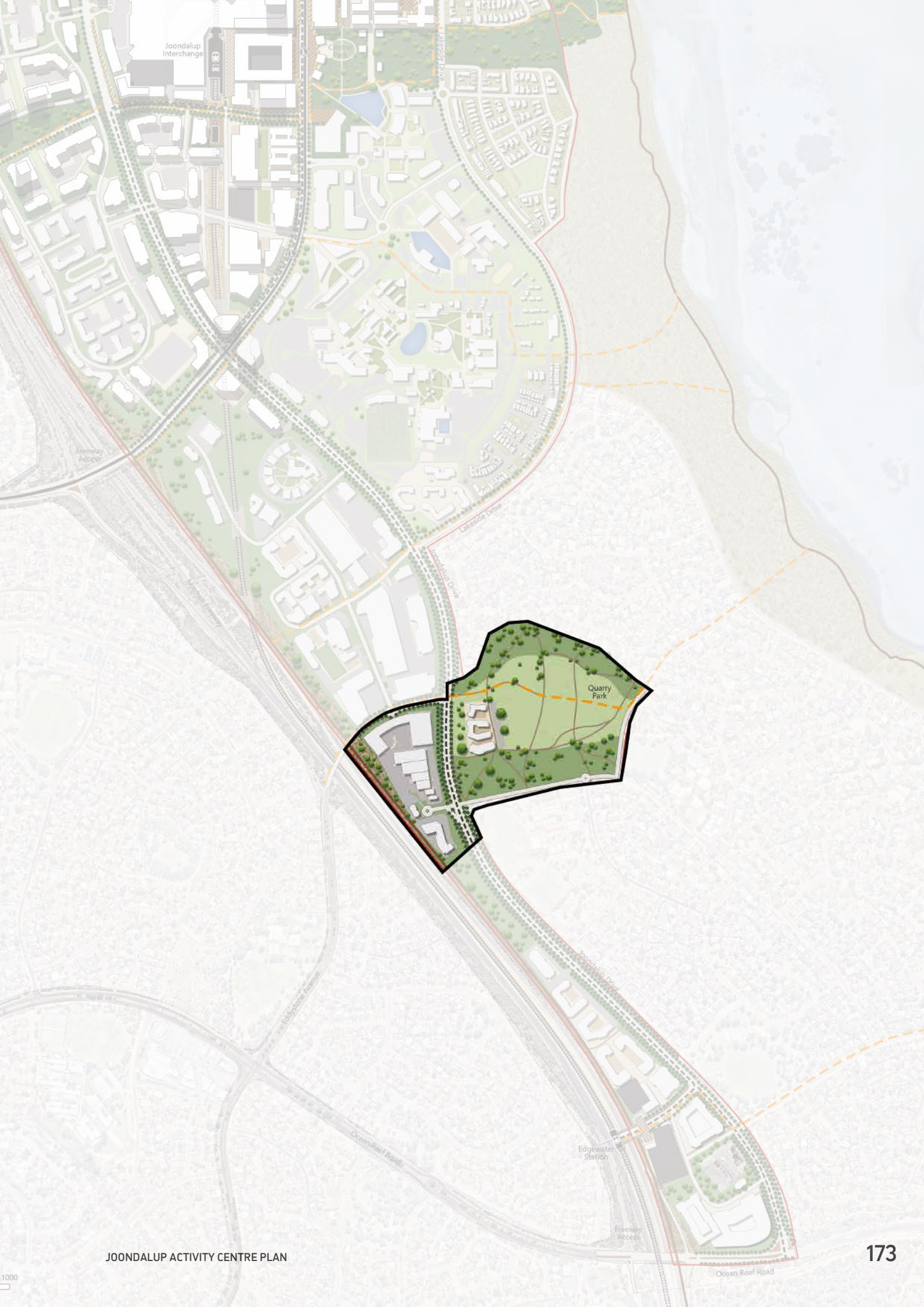
- + Provide medium-high density residential along western side of Joondalup Drive adjacent Quarry.
- + Establish a new residential community at the Quarry. The Quarry will provide development that responds to the unique character of the topography and setting and develop as a pre-eminent sustainable community in landscape.
- + Eastern portion of the site to be retained for parks and recreation with potential for an adventure playground.
- + Support mixed use development in the western portion of the Quarry fronting Joondalup Drive.

Movement

- + East-west linkages from west of Freeway (Ocean Reef Road) to the Principal Shared Path and east through Edgewater Quarry to the Lake for pedestrians and cyclists.
- + Bus priority lanes on Joondalup Drive improve public transport access.

Urban Form

- + Housing should be configured to optimise public open space.
- + Maximise the potential for dwelling numbers and minimise impacts on surrounding housing. This will likely entail taller buildings placed carefully in the landscape.
- + Explore typologies that include new living arrangements such as dual key and universal access and for single and person and multi generational family units
- + Explore typologies for new methods of construction such as modular and engineered timber.
- + The housing is set in a landscape that celebrates the unique and topographic aspects of the quarry and provides the new and surrounding housing with valuable and usable open space.



Joondalup Interchange

Centre

Joondalup Drive

Freeway Access

Witchamper Freeway

Lakeside Drive

Joondalup Drive

Quarry Park

Ebbystone Avenue

Ocean Reef Road

Edgewater Station

Freeway Access

Ocean Reef Road



7.4.7 PRECINCT 7 - LAKESIDE RESIDENTIAL

7.4.7.1 *PRECINCT INTENT*

The Lakeside Residential Precinct is comprised of three established low-density residential areas situated on the eastern boundary of JAC. These areas contribute to housing diversity in JAC by providing larger household/dwelling options. No major redevelopment is expected in this precinct, however, strengthening east-west movement will improve connectivity for pedestrians and cyclists to and from the Lakeside Residential Precinct.

The precinct has limited opportunity for retail/food and beverage land uses, the intent of the precinct is to enable a level of convenience for residents by encouraging these uses, however, drive through outlets are not encouraged.

7.4.7.2 *PRECINCT OBJECTIVES*

- a) Preserve the existing residential character.

7.4.7.3 *PRECINCT INITIATIVES*

Activity

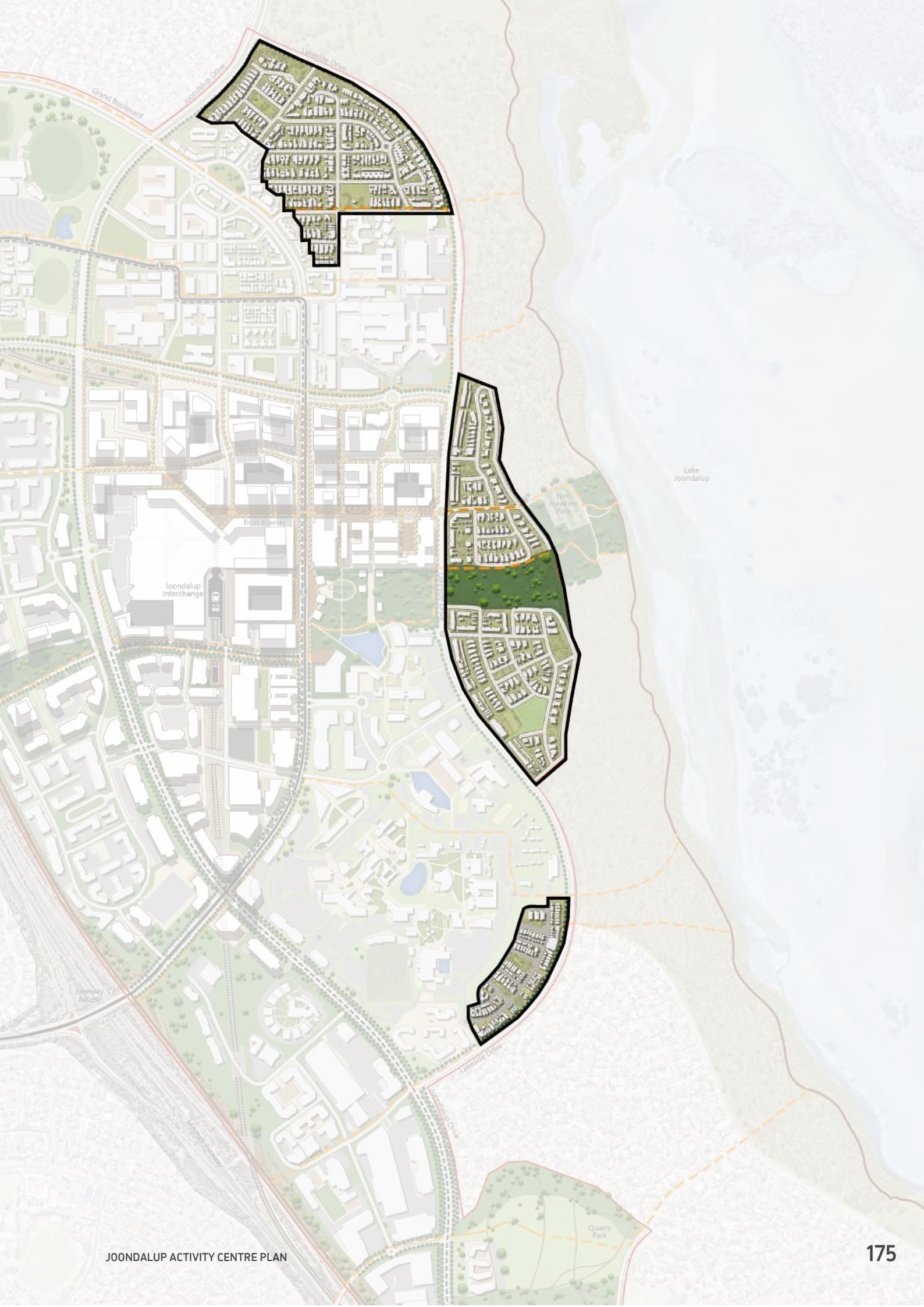
- + Support a higher residential density on lots on Lakeside Drive that are situated within the 800m walkable catchment of Joondalup Train Station.
- + Support mixed use development in the northern portion of the precinct along Grand Boulevard and Joondalup Drive to frame the northern entrance into the JAC.

Movement

- + Enhance pedestrian and cyclists connectivity to the precinct through enhanced movement corridors on Moore Drive, Boas Avenue, Reid Promenade and through Central Park.

Urban Form

- + Preserve the existing residential character.
- + Ensure that future residential development does not adversely impact the Yellagonga Regional Park interface.



08 RESOURCE CONSERVATION

OBJECTIVES

- a) Adopt an environmentally sustainable approach to development within the JAC.
- b) Create a green open space and landscaped street network to lessen the heat island effect of city centre development
- c) Encourage conservation of resources, including reduced waste and energy and water use.
- d) Encourage solar access, natural cross ventilation and renewable energy use in buildings.
- e) Maximize solar access and good microclimate conditions in public open spaces and city squares.
- f) Optimise water resource conservation and water quality management outcomes.

8.1 Resource Conservation

OBJECTIVES

- a) Adopt and encourage the community and investors to extend an environmentally sustainable approach to all development within the City.
- b) Create a green open space and landscaped street network to reduce the heat island effect of future development.
- c) Encourage conservation of resources, including reduced waste and energy and water use.
- d) Encourage solar access, natural cross ventilation and renewable energy use in buildings.
- e) Maximize solar access and good microclimate conditions in public open spaces and city squares.
- f) Optimise water resource conservation and water quality management outcomes.

8.1.1 SUSTAINABLE DEVELOPMENT

The JACP encourages all new development to adopt energy and water efficient building and landscape design including:

- + Building design and orientation to optimize solar access and natural cross ventilation
- + Use of environmentally responsible and effective building materials
- + Use of solar energy and water heating
- + Adoption of water sensitive urban design and water-wise landscape principles
- + Water recycling and rainwater and storm water harvesting

The objective to reduce the heat island effect of future development can be achieved through creation of a green open space network and well landscaped tree-lined streets. To add to the effect in the public realm, 'green' vegetated roofs and walls on both existing and new buildings are also encouraged.

8.1.2 ENERGY

All new development in Joondalup should incorporate energy efficient building design to meet established benchmarks of State and local policies. All new buildings should be orientated to optimise solar access, natural cross ventilation and incorporate thermally efficient building materials.

8.1.3 WATER

There are significant opportunities on large land parcels and campuses to incorporate water harvesting and recycling systems.

Key elements of water sensitive urban design include management of water quantity and quality and water conservation, efficiency and re-use. Water efficient landscape design and irrigation practices should be used to limit future public open space irrigation demand to current licensed volumes.

Measures to deliver better water resource management outcomes include:

- + Permeable paving
- + Landscaped swales, infiltration trenches and bio-retention systems;
- + Gross pollutant traps, wetlands and sediment ponds
- + Rainwater tanks, stormwater and greywater harvesting and reuse
- + Water-wise gardens, rooftop greening and urban forests



8.1.4 ENVIRONMENT

Whilst the DOP does not require an Environmental Management Strategy, given the number of environmentally sensitive areas within and adjacent to the JACP area it is recommended that a holistic approach to managing potential environmental impacts of future development/s be taken. The JACP promotes increased activation of Yellagonga Regional Park and Neil Hawkins Park. These areas are protected under the Environmental Protection and Biodiversity Conservation Act therefore development will need to be carefully managed to minimise any impacts and lead to better environmental outcomes.

8.1.5 MATERIALS AND WASTE

To minimise waste during construction:

- + Use environmentally approved and/or recycled content products
- + Re-use materials where practicable
- + Prepare a waste management plan
- + Remove waste (materials that cannot be reused or recycled) from the site.
- + Collect and sort recyclable construction materials
- + Mulch and stockpile green waste for use in landscape works
- + Erect screening for dust and litter control

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Hames
SHARLEY



ARCHITECTURE
INTERIORS
URBAN DESIGN
PLANNING
LANDSCAPE

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