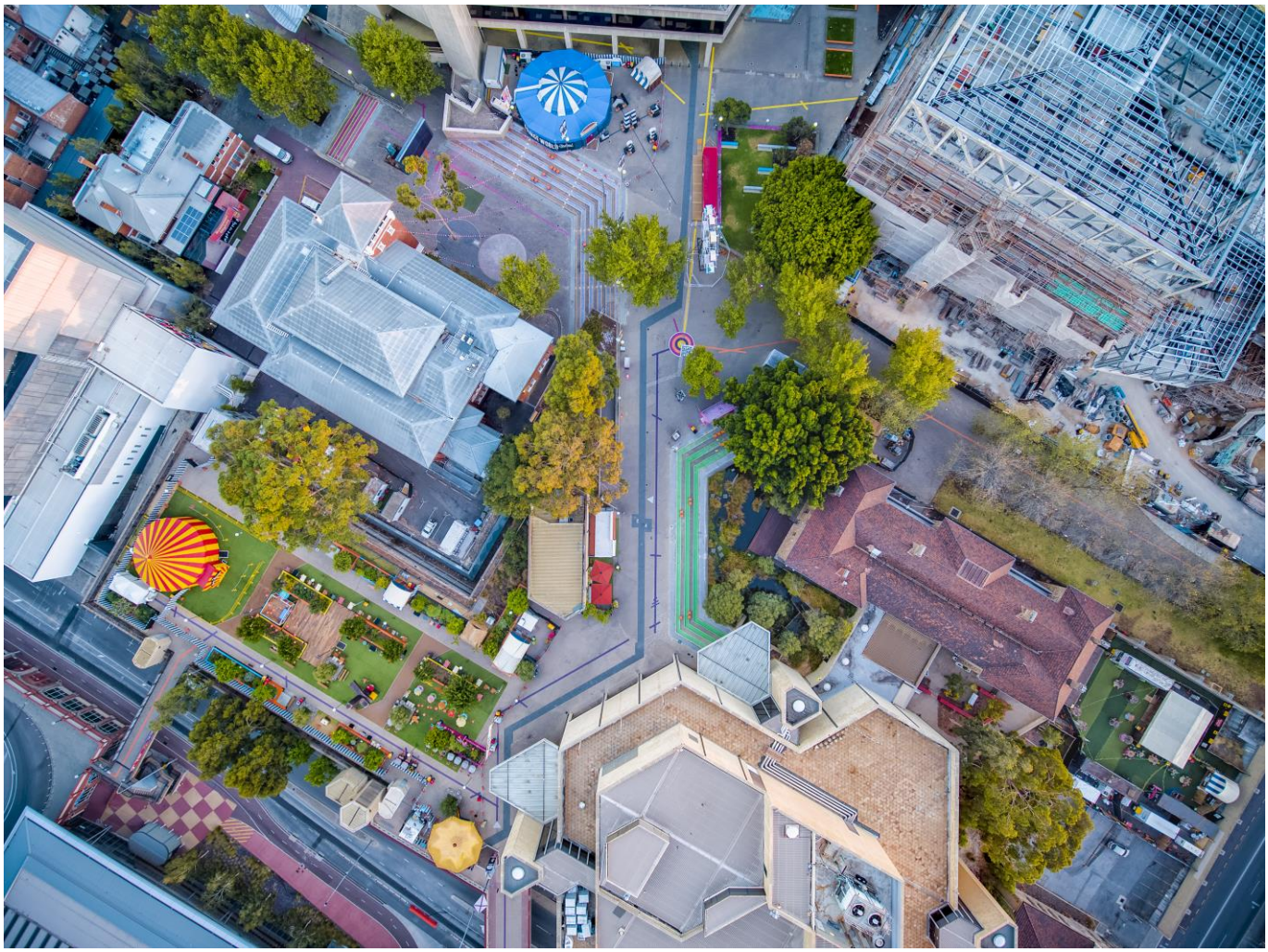
Appendix A – City-Wide Local Profile Analysis

May 2023



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27 St Georges Terrace, Perth
GPO Box C120, Perth WA 6839
Telephone: (08) 9461 3333
Email: city@cityofperth.wa.gov.au

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1. City-wide profile and analysis

The city-wide profile and analysis provides information that has been considered in understanding Perth city (as it applies across the Local Planning Strategy's theme areas). It also explores the issues the City faces when future planning, and the way these issues affect our approach to the Local Planning Strategy.

1.1. Demographic profile and population forecast

1.1.1. Existing profile and trends

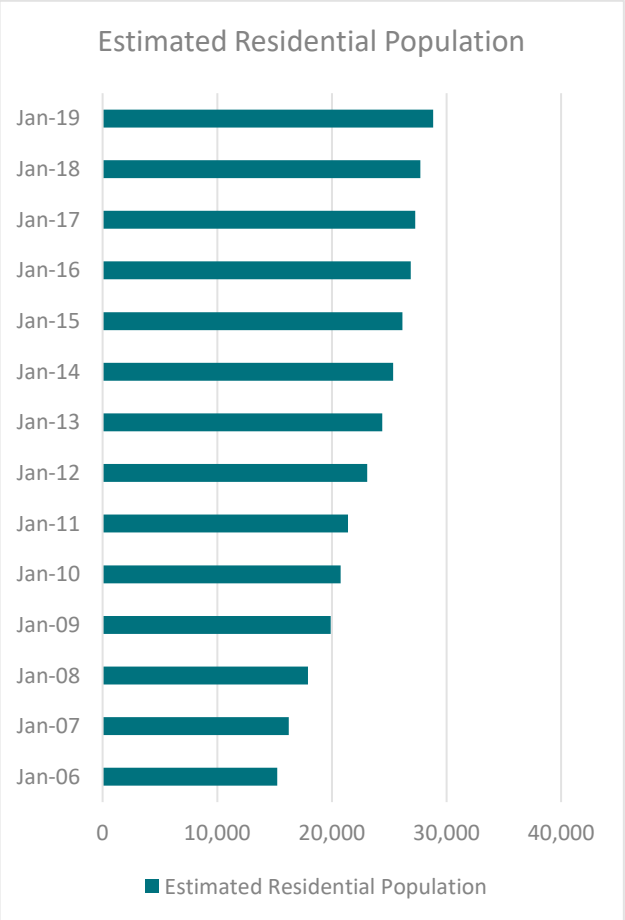
1.1.1.1. Population profile

Perth city attracts the largest concentration of people in Greater Perth each day, reflecting its capital city status and the wide variety of opportunities for work, education, entertainment, shopping, recreation, services, tourism and social and cultural activities.

Growth and density

The resident population of Perth city has grown at a rapid rate over the past decade and was the second fastest-growing local government area within Greater Perth (Urbis, 2018). The population increased from 15,232 in 2006 to 28,832 estimated residents in 2019, refer to **Figure 1** (Profile.id, 2021). However, population growth has slowed, with the average annual population growth 2.8% between 2014 and 2019, compared to 7.0% between 2007 and 2013.

Figure 1 - Population growth (ERP) in Perth city, 2006-19



The residential population across each of Perth city's six neighbourhoods, as at 2016, is illustrated in Table 1.

Table 1 - Residential population by neighbourhood (Australian Bureau of Statistics, 2016)

Neighbourhood	2016 population
Central Perth	5,672
Claisebrook	3,938
Crawley-Nedlands	5,141
East Perth	7,288
Northbridge	2,053
West Perth	2,858

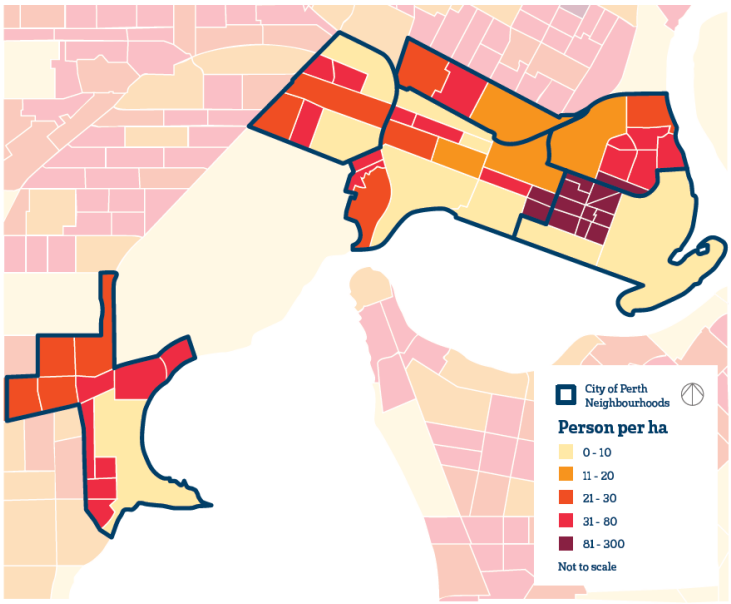
Over the past decade, Perth city has grown its share of Greater Perth's resident population, increasing from 1.0% of the population in 2006 to 1.3% of the population in 2016 (refer to **Table 2**).

Table 2 - Census population (Australian Bureau of Statistics, 2001 – 2016)

	2006	2011	2016
Greater Perth	1,512,083	1,728,867	1,943,858
City of Perth	15,229	20,677	26,128
% of Greater Perth	1.0%	1.2%	1.3%

The city's weighted population density (excludes non-residential open spaces/reserves) is 67.5 people per hectare with density highest in the western portion of East Perth. This is notably higher than typical suburban contexts across Greater Perth which generally range between 35 – 45 people per hectare (Urbis, 2018). As would be expected, population density is significantly lower in areas that have historically been used for commercial or civic uses, such as around Central Perth (refer to **Figure 2**).

Figure 2 - Population density in Perth city

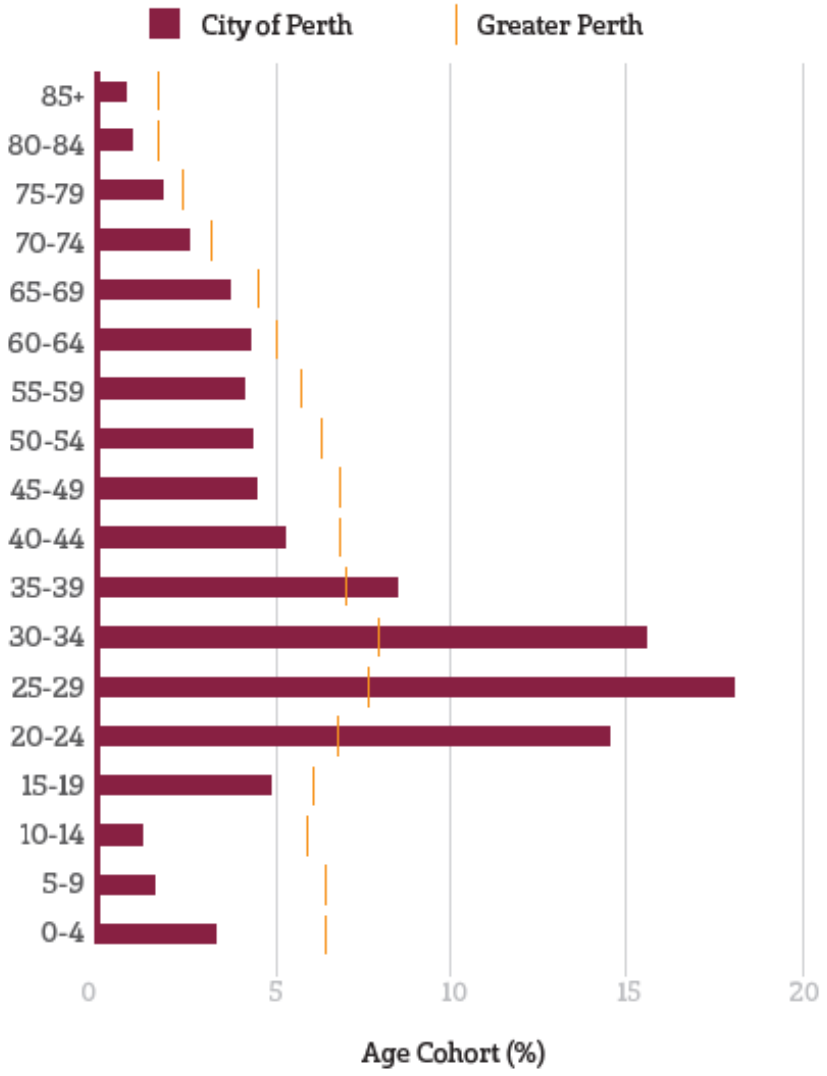


Over the past decade, Perth city has seen a substantial increase in population density, however, it is still low compared to central Sydney (671 persons per ha) and Melbourne (525 persons per ha)(Urbis, 2018).

Age and sex

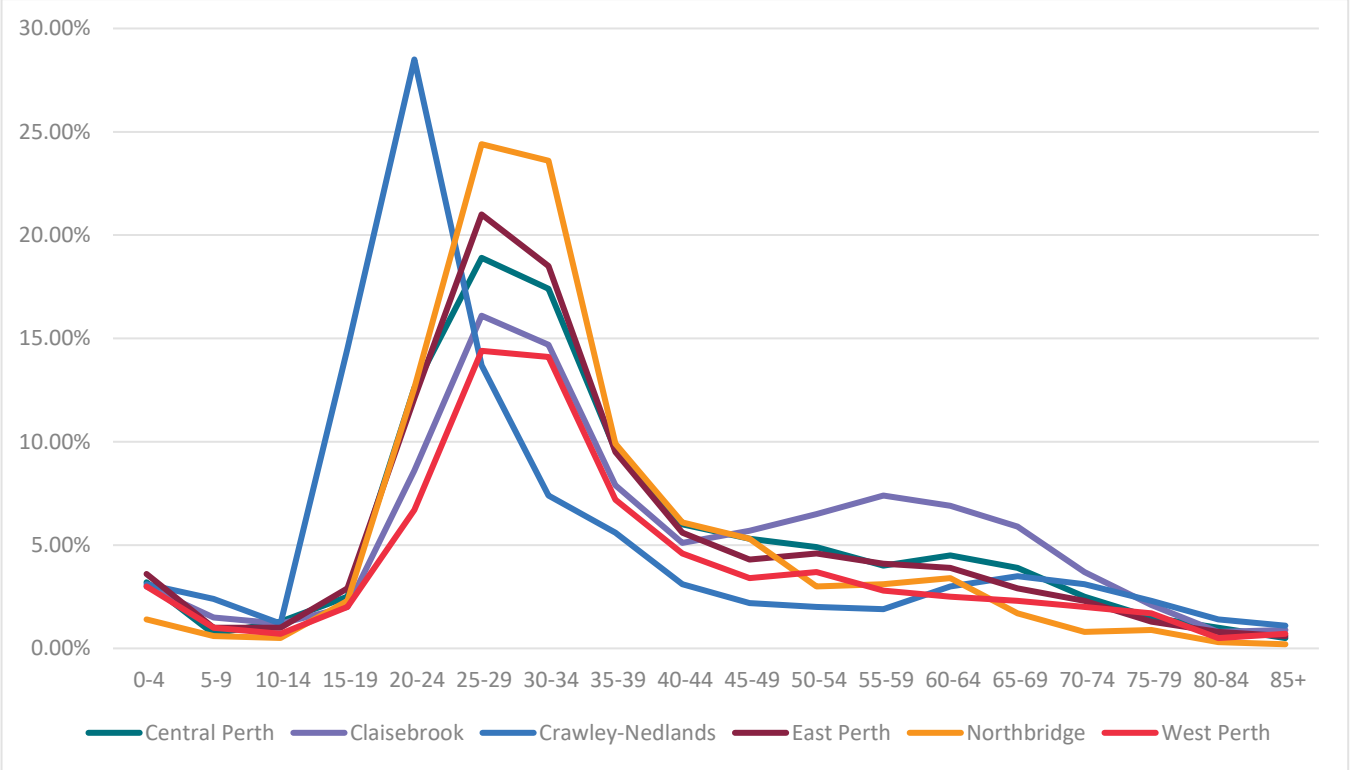
There is a slightly higher proportion of male residents than female residents in Perth city (52.4% compared to 47.5%), which differs from Greater Perth (49.6% compared to 50.4%). The age of residents in the city is largely different to Greater Perth, with very low percentages of children, teens and people older than 40. The 20-39 age bracket forms the largest proportion of Perth city's population (57.7%) which is significantly higher than Greater Perth (29.7%) (refer **Figure 3**).

Figure 3 – Total Population by Age Cohort, Perth city residents vs Greater Perth residents (Australian Bureau of Statistics 2016)



Age distribution across the city's six neighbourhoods is fairly consistent, with specific exceptions (refer **Figure 4**). There is a greater proportion of young people aged 15-24 and a lower proportion of people aged 25-59 in Crawley-Nedlands. The proportion of people aged 20-39 in Northbridge (70.6%) is even greater than Perth city generally and Claisebrook accommodates a comparatively higher proportion of people aged 45-69.

Figure 4 – Neighbourhood Population by Age Cohort (Australian Bureau of Statistics 2016)



Household attributes

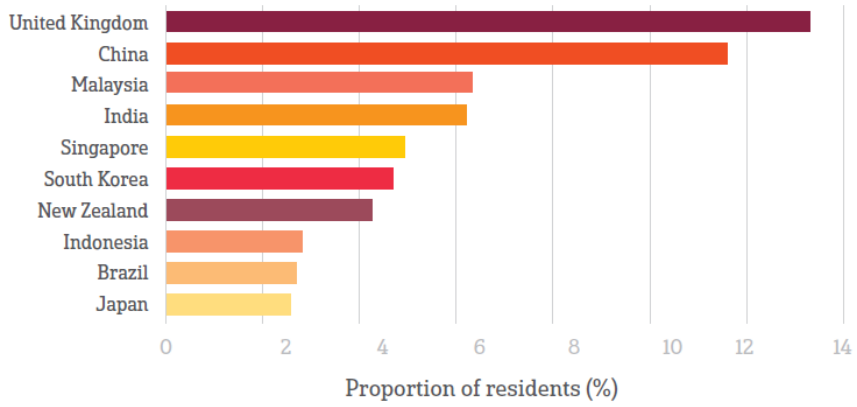
Households within the city are primarily couples without children (27.1%), and lone-person households (32.1%)(Profile. id, 2017). Families with children only account for approximately 14.3% of total households. This is comparable to the inner-city areas of Melbourne and Sydney, which also had a low proportion of households containing children (approximately 17.5%) (Urbis, 2018). The number of households containing families with children is substantially higher across Greater Perth (46% of total households).

Ethnicity and language spoken at home

There are many people born outside of Australia (13,563) living in Perth city – over half of the total population (54.7%) (Australian Bureau of Statistics, 2016). This contrasts with Greater Perth, which has a much higher proportion of Australian-born residents. The most common countries of birth outside of Australia are the United Kingdom (13.3% of residents born outside of Australia) and China (11.6%) (refer to **Figure 5**). Population change over the 2011 to 2016 period suggests that China, Southern Asia and Korea/Japan-born residents increased at a faster rate than other cohorts.

The resident Aboriginal and Torres Strait Islander population is comparatively small (218 persons) and represents less than 1.0% of Perth city residents (compared to 1.6% across Greater Perth).

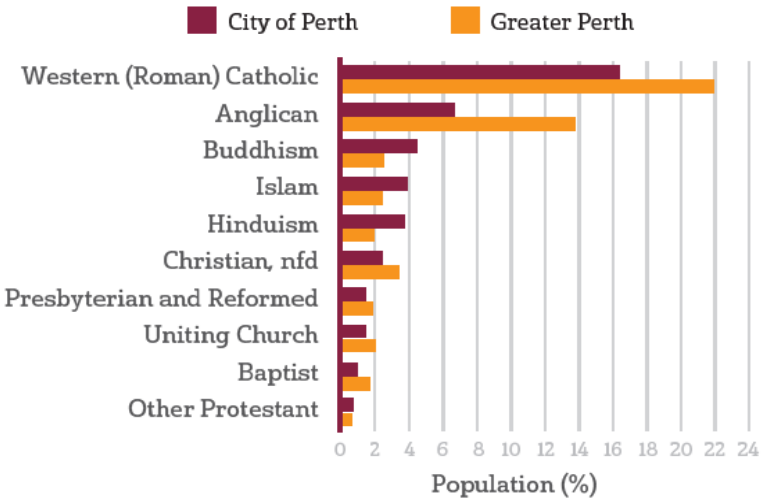
Figure 5- Country of birth of residents born outside of Australia (Australian Bureau of Statistics, 2016)



In 2016, 38.6% of Perth city residents spoke a language other than English at home, compared to an average of 20.1% across Greater Perth. The top three languages were Mandarin (9.2%), Cantonese (2.8%) and Korean (2.4%), compared to the top three across Greater Perth – Mandarin (2.3%), Italian (1.4%) and Cantonese / Filipino / Vietnamese (1.0% each) (Australian Bureau of Statistics, 2016). The proportion of residents speaking Mandarin and Cantonese in Perth city was slightly lower than other capital city locations.

In 2016, the largest religious group in Perth city was Western (Roman) Catholic, which accounted for 16.4% of the 45.8% of the population who nominated a religion. Whilst this is lower than Greater Perth, Perth city has a greater percentage of people who affiliate with Buddhism, Islam and Hinduism (refer to **Figure 6**).

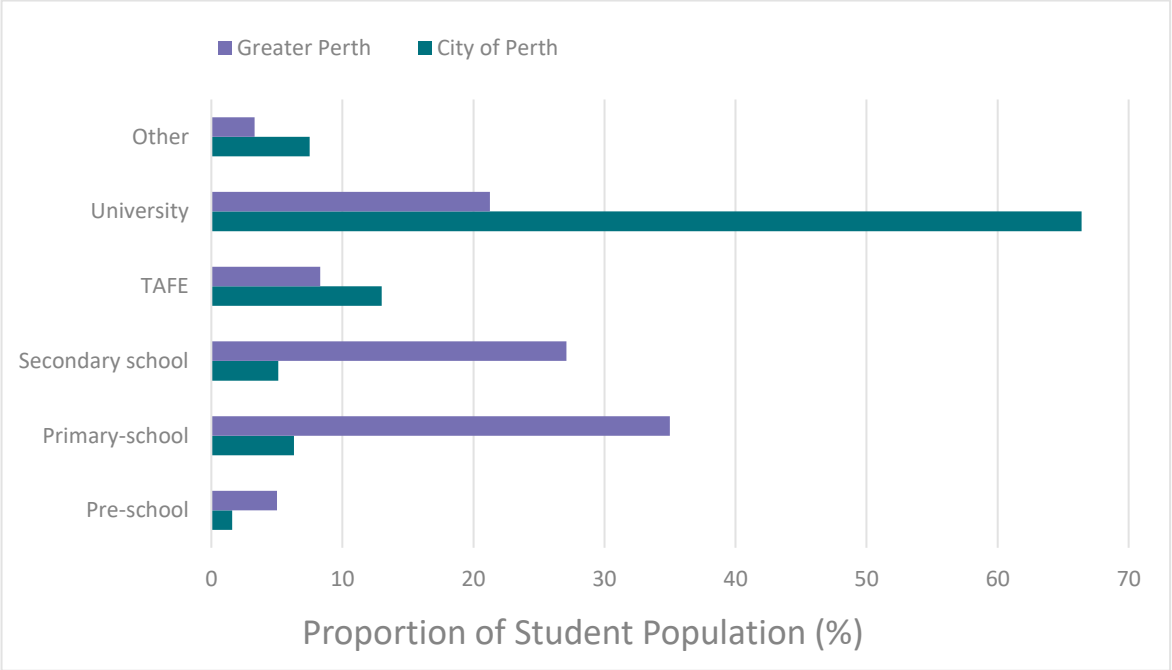
Figure 6 - Religion, Perth city resident's vs Greater Perth residents (Profile. id, 2016)



Education, employment and income

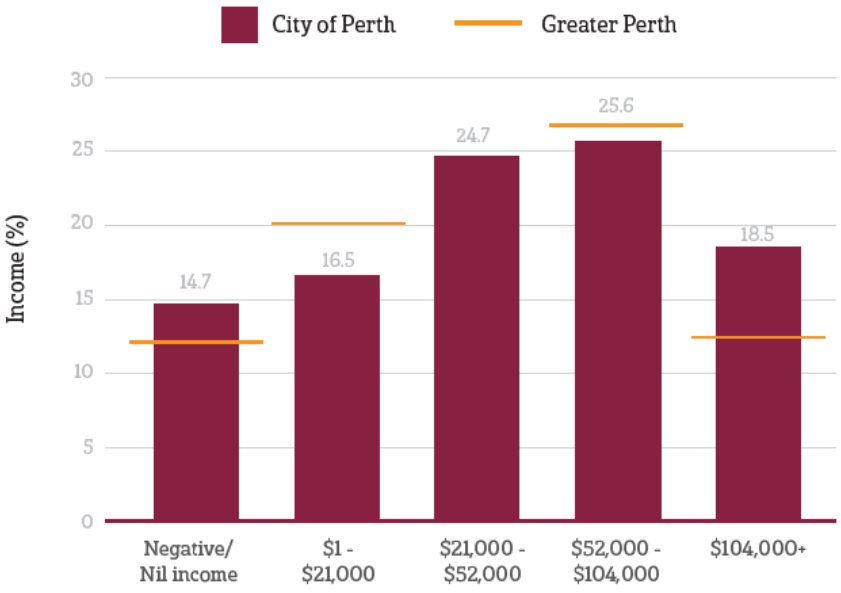
In 2016, a total of 6,318 residents within Perth city attended educational institutions. Of this student population, 79.5% attended tertiary institutions which is significantly higher than the Greater Perth average of 21.25%. Conversely, the low number of children in Perth city's population means a lower percentage of primary and secondary students (6.2% and 5.1% respectively) (refer to **Figure 7**).

Figure 7 – Student Population by Institution (Australian Bureau of Statistics, 2016)



Residents within the city are relatively wealthy, with a high proportion of the population earning more than $104,000 (18.5%). However, when compared to Greater Perth, a relatively high proportion of the population do not receive an income (14.7%) (refer to **Figure 8**).

Figure 8 - Annual individual income, Perth city residents vs Greater Perth residents (Australian Bureau of Statistics, 2016)



Perth city has a relatively high labour force participation rate of residents, with 60% of residents aged over 15 years employed or looking for work. More residents work full-time (46%) than in part-time work (17%). However, the unemployment rate in Perth city is approximately 10%, which is relatively high compared to the Greater Perth rate of 8% (refer to **Table 3**).

Table 3 - Labour force status of residents in Perth city (Profile. id, 2016)

Labour Force Status	Number of People	Proportion (%)
Employed	12,675	89.7
Employed full-time	8,426	59.6
Employed part-time	4,002	28.3
Hours worked not stated	247	1.7
Unemployed (Unemployment rate)	1,458	10.3
Looking for full-time work	702	5.0
Looking for part-time work	756	5.3
Total labour force	14,133	100.0

The largest proportion of Perth city workers are in the 25-34 and 35-44 age groups, representing 52.8% of total workers. The most common industries for city resident workers are professional services (namely professional, scientific and technical services (14.3%), and mining (8%)). There is also a relatively high proportion of residents employed in industries such as accommodation and food services (13.7%), health care and social assistance (10.1%), and retail trade (6.4%) (refer to **Table 4**).

Table 4 - Industry of employment of residents in Perth city (Australian Bureau of Statistics, 2016)

Industry	Number of People	Proportion (%)
Professional, scientific and technical services	1,647	14.3%
Accommodation and food services	1,577	13.7%
Health care and social assistance	1,158	10.1%
Mining	922	8.0%
Retail trade	742	6.4%
Construction	732	6.4%
Education and training	695	6.0%
Public administration and safety	652	5.7%
Administrative and support services	509	4.4%
Inadequately described	445	3.9%

Primarily, residents are employed as professionals (35%), managers (16%) and clerical administrative workers (12%). There is a low portion of labourers, machinery operators and trades workers residing in the city (refer to **Table 5**).

Table 5- Occupation of residents in Perth city (Australian Bureau of Statistics, 2016)

Occupation	Number of people	Percentage (%)
Professionals	3,987	35%
Managers	1,791	16%
Clerical and administrative workers	1,330	12%
Community and personal service workers	1,245	11%
Technicians and trades workers	1,143	10%
Labourers	810	7%
Sales workers	727	6%
Machinery operators and drivers	267	2%
Inadequately described	135	1%

Only 5,641 Perth city residents work within the city. All other peoples who work in Perth city live in other local government areas (LGA). The most common areas where Perth city workers live are Joondalup, Wanneroo, Melville and Bayswater (refer to **Table 6**).

Table 6 - Perth city workers by place of usual residence (LGA) (Australian Bureau of Statistics, 2016)

LGA	Number of People
Joondalup (C)	10,927
Wanneroo (C)	9,035
Melville (C)	7,234
Bayswater (C)	6,247
Swan (C)	5,986
Canning (C)	5,912
Vincent (C)	5,814
Perth (C)	5,641
Gosnells (C)	5,235
Cockburn (C)	5,109

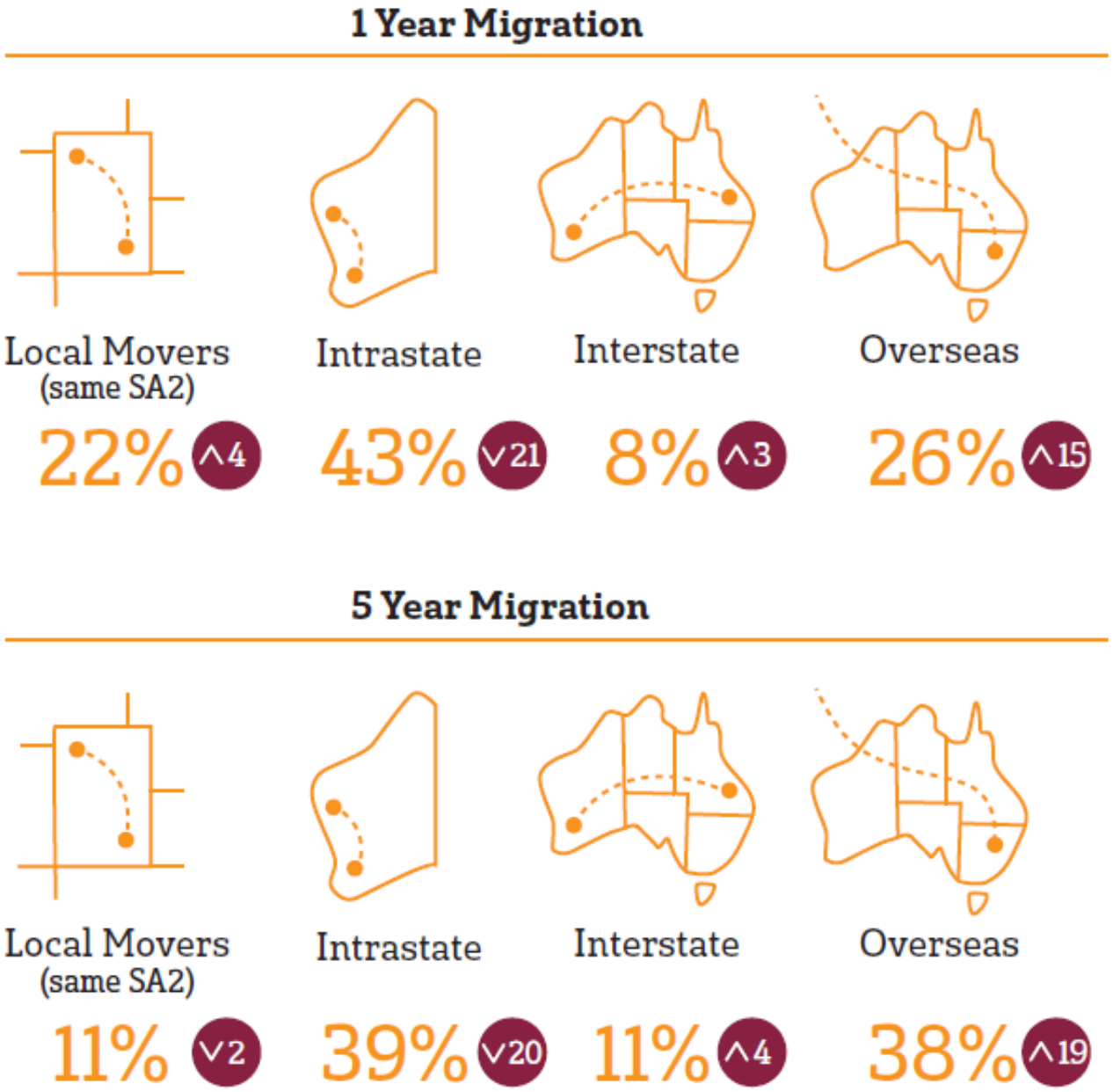
Migration patterns

New residents who moved to Perth city between 2011 and 2016 were most likely to have moved from the inner-ring suburbs of Perth. The highest local migration was residents moving from Subiaco-Shenton Park closely followed by residents moving from Mount Lawley-Inglewood (Urbis, 2018). Similarly, residents who left Perth city between 2011 and 2016 tended to move to suburbs nearby – demonstrating that nearby areas often draw residents away from the city (Urbis, 2018).

One-year migration data shows a high level of people moving locally within Perth city, and a relatively low level of overseas migration (26%). However, the five-year migration data shows a trend towards a lower percentage of

local migration, and a high percentage of overseas migration (38%). Over the five-year period, Intrastate migration has remained the highest migration contributor (refer to **Figure 9**).

Figure 9 - One and five-year migration to Perth city (Urbis, 2018)



Perth city has a relatively high resident turnover compared to Greater Perth, with only around 18% of residents having lived at the same address in the five years prior to the 2016 Census. However, this figure is similar to other inner-city local government areas, with Melbourne at 22% and Sydney at 34%. Notably, both Melbourne and Sydney's local government areas cover a larger land area of historically residential suburbs (Urbis, 2018).

1.1.1.2. Population growth forecasts and target

Population forecasts and projections estimate the future size, distribution and characteristics of the population. These forecasts show Perth city's likely future if current and emerging trends continue as they are. The City reviewed population forecasts from three different sources in the development of the Local Planning Strategy:

- Western Australia (WA) Tomorrow forecasts (developed by the State Government);
- Forecasts from .id Consulting (data subscription held by the City of Perth); and
- Population modelling by Urbis (as part of the 2018 Housing Analysis).

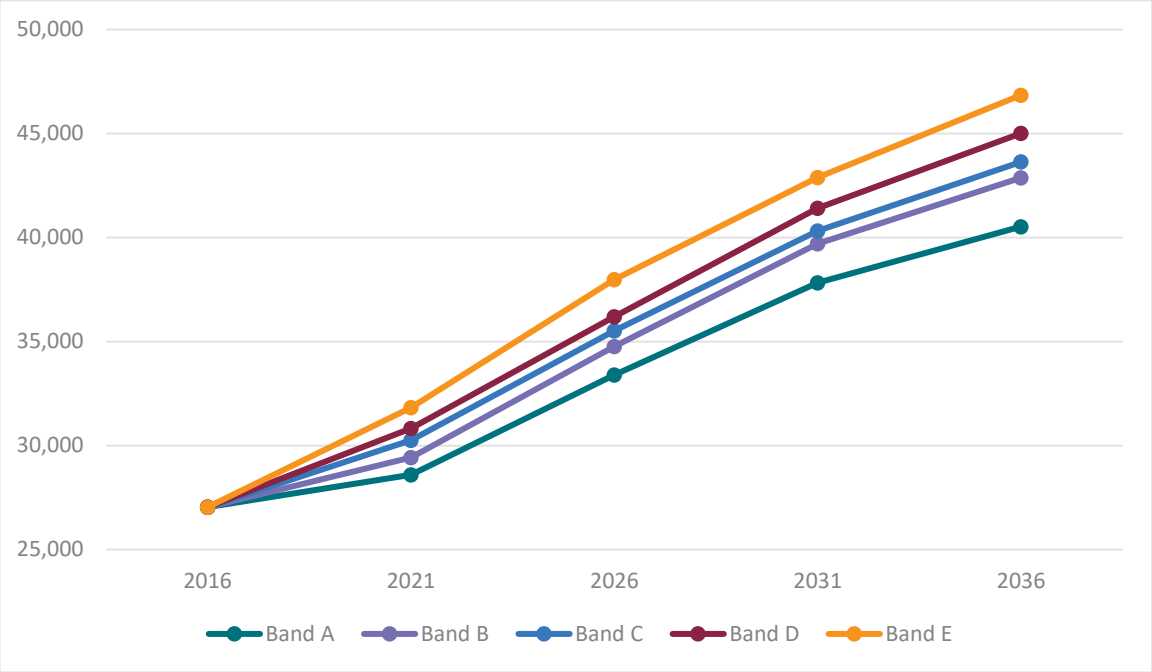
WA Tomorrow

WA Tomorrow provides estimates of Western Australia's future population based on current fertility, mortality and migration trends. This forecast is then apportioned among different geographic areas, including local government areas (LGA) in a 'top-down' process. WA Tomorrow includes five forecast 'bands' (A to E) that show a range from high growth (A) to low growth (E). Band C is the median forecast (refer to **Figure 10**).

The most recent WA Tomorrow forecasts were released in 2019, and forecast out to 2031. The scenarios can be summarised as follows:

- Band A: 37,830 residents by 2031 (10,790 additional) – annual growth rates 1.2-3.4%.
- Band B: 39,710 residents by 2031 (12,670 additional) – annual growth rates 1.8-3.6%.
- Band C: 40,320 residents by 2031 (13,280 additional) – annual growth rates 2.4-3.5%.
- Band D: 41,420 residents by 2031 (14,380 additional) – annual growth rates 2.8-3.5%.
- Band E: 42,890 residents by 2031 (15,850 additional) – annual growth rates 2.5-3.9%.

Figure 10 - Population forecasts Perth city from WA Tomorrow (Department of Planning, Lands and Heritage, 2019)



Note: forecasts are extrapolated to 2036 based on mean annual increase between 2016 – 2031.

.id Consulting forecasts

.id Consulting produces population forecasts covering a period until 2041 for Perth city as part of their demographic data product suite. These forecasts are based on a combination of three statistical models (Forecast. id, 2020), which consider trends in births, deaths, ageing and migration, as well as incorporating information about planned residential development activity. The most recent forecast from .id was released in May 2020.

The current forecasts indicate that Perth city will grow to 43,018 people by 2036 (1.7% - 4.0% annual growth rate), which aligns with the WA Tomorrow forecasts above. As demonstrated in **Table 7**, there is substantial difference in the growth forecast for across city's neighbourhoods. The population of Central Perth is expected to increase significantly between 2016 and 2036, while the population of Crawley-Nedlands and West Perth are expected to see little growth over the same period. These projections reflect the current residential development trends in these areas, and are an indication of what is likely to occur in the absence of any major intervention to the existing planning framework.

Table 7 - Forecast population and dwellings from .id Consulting (Forecast. id, 2020)

Neighbouhood	2016		2026		2036		2041	
	Population	*Dwellings*	*Population*	*Dwellings*	*Population*	*Dwellings*	*Population*	*Dwellings*
Central Perth	5,672	2,596	9,831	4,306	11,915	5,482	14,116	6,661
Claisebrook	3,938	1,945	4,473	2,316	5,840	3,040	6,660	3,481
Crawley-Nedlands	5,141	1,554	6,006	1,639	6,770	2,001	7,220	2,216
East Perth	7,288	3,651	8,428	4,286	10,466	5,406	12,616	6,551
Northbridge	2,053	928	3,444	1,247	3,867	1,480	3,978	1,540
West Perth	2,858	1,608	3,572	1,913	4,160	2,261	4,517	2,464
Total	26,950	12,282	35,754	15,707	43,018	19,670	49,107	22,913

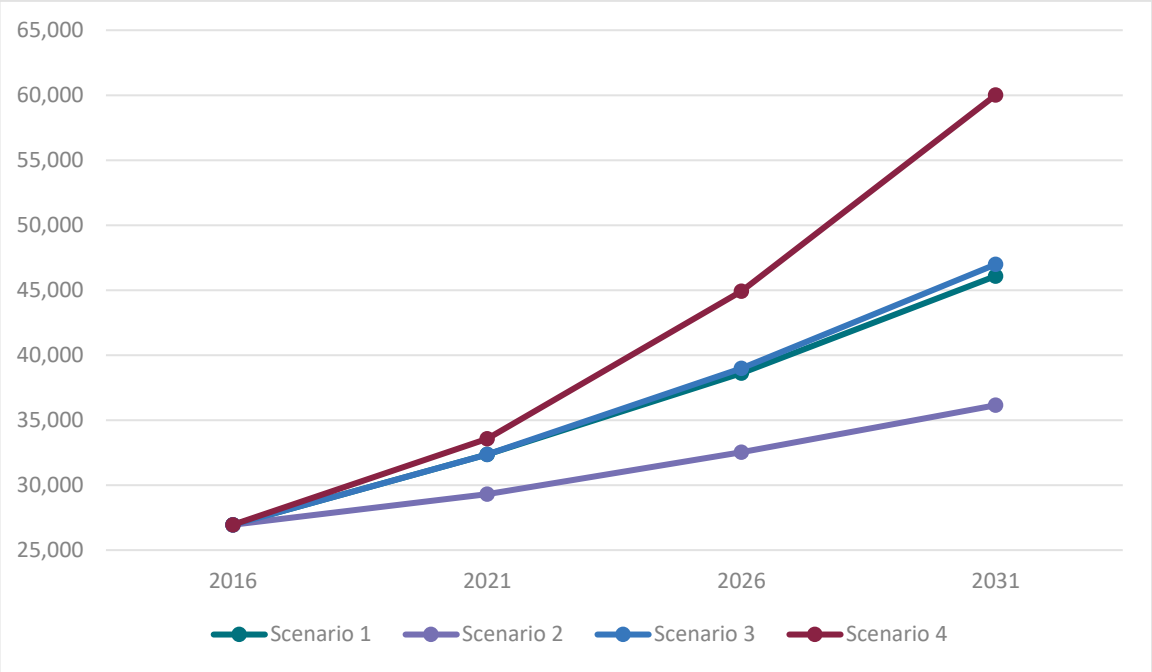
2018 Housing Analysis scenario projections

As part of City's 2018 Housing Analysis, four population growth scenarios were investigated. The scenarios can be summarised as follows:

- **Scenario one: 46,085 residents by 2031 (19,129 additional) – annual growth rates 3.6-3.7%):** based on Greater Perth's population experiencing consistent growth towards 3.5 million by 2050, and trends within Perth city expected to continue.
- **Scenario two 36,146 residents by 2031 (9,190 additional) – annual growth rates 1.7-2.1%):** increased competition and investment in infill development in neighbouring areas, whereby Perth city captures a lower market share of Greater Perth's population growth than current trends.
- **Scenario three 46,983 residents by 2031 (20,027 additional) – annual growth rates 3.7-3.8%):** a diversity scenario, whereby a combination of cultural trends, expanded amenities and services and family-friendly dwelling products encourages an increasing number of families and older residents remaining in/moving to Perth city.
- **Scenario four 60,006 residents by 2031 (33,050 additional) – annual growth rates 4.5-6.0%):** a high growth scenario, whereby the City captures an increasing share of Greater Perth's population growth (compared to historical averages).

The models were calculated by estimating how the key inputs (age-specific fertility, mortality and migration rates) would vary in each scenario (refer to **Figure 11**).

Figure 11 - 2018 Housing Analysis Population Scenario Projections



Key outcomes emerged when these projections were compared and analysed:

- The Perth city's demographic mix (in terms of age and household composition) will largely remain unchanged unless there is significant intervention. The most significant driver of population growth for the City is expected to be migration, particularly the in-migration of young adults and the out-migration of establishing families (i.e. young children and adults in their 30s). A major change to these dynamics would be needed to significantly alter the City's demographic mix;
- Scenarios one, three and five indicate more growth than all WA Tomorrow bands and id.Consulting forecasts; and
- The age profile and household composition of residents does not differ much between different dwelling types which indicates that families are still very likely to live in apartments.

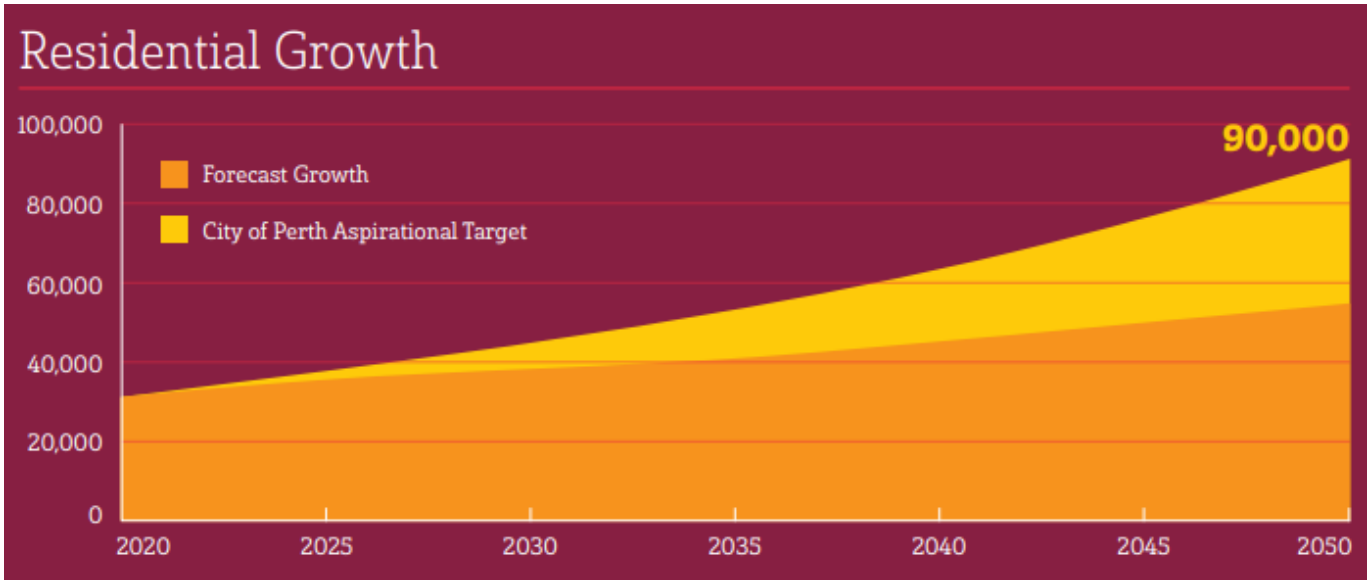
Population target

Strategic Community Plan 2050 target

In preparing the Strategic Community Plan, an aspirational population target was investigated to guide residential growth within Perth city. Upon reviewing the various population forecasts outlined above, a population target of 90,000 by 2050 was chosen which represents an annual growth rate of approximately 3.6% and a tripling of the city's existing population. This target was endorsed under the Strategic Community Plan 2019 – 2029.

Figure 12 illustrates this aspirational growth target relative to the forecast growth rate provided by id. Consulting.

Figure 12 - Population Growth - Aspirational Target vs Forecast.id Estimate



Although exceeding the forecasts provided by WA Tomorrow and id.Consulting, the target above is viewed as a moderate growth rate in light of the growth scenarios offered in the Colliers 2018 Housing Analysis. Such a target is a realistic aspiration, particularly as the city expands its amenities, services and dwelling types to attract a range of demographics.

2036 population target and neighbourhood distribution

This Local Planning Strategy is a 15-year document and therefore seeks to provide population targets to approximately 2036. Using the 3.6% growth rate endorsed under the Strategic Community Plan, Perth city's population would reach approximately 55,000 by 2036 (refer to **Figure 12**).

To distribute this population target by neighbourhood, a methodology was developed which examined:

- Three reference models (refer to **Figure 13**):
    - **Model 1: Existing neighbourhood distribution** – 55,000 population target distributed using the proportion of existing neighbourhood populations.
    - **Model 2: Forecast neighbourhood distribution** – 55,000 population target distributed using the proportions of population forecasts provided by .id Consulting.
    - **Model 3: Neighbourhood development capacity** – 55,000 population target distributed according to where development capacity exists under the City's planning schemes (refer **Error! Reference s ource not found.** for further information on development capacity); and
- Neighbourhood population growth constraints and opportunities (refer to **Table 8**).

Figure 13 - Neighbourhood population distribution reference models

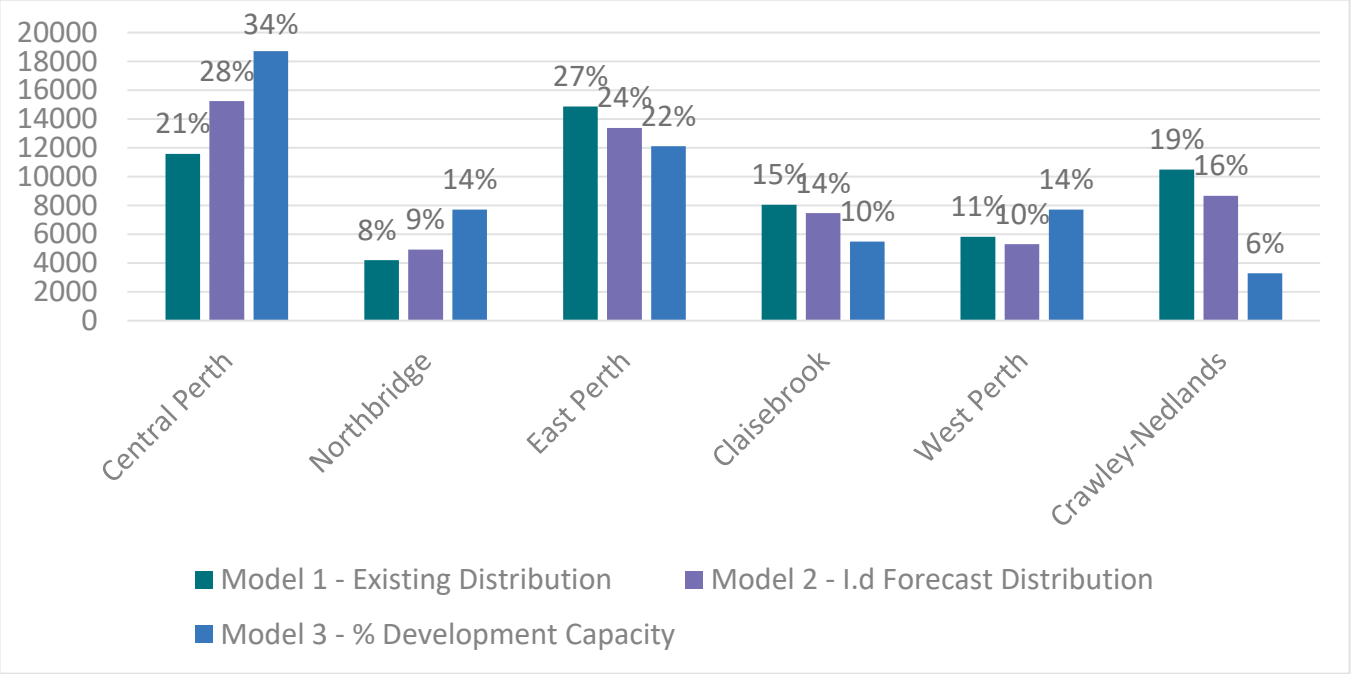


Table 8 – Neighbourhood residential growth constraints and opportunities summary

	Constraints	Opportunities
Central Perth	• Primarily commercial market. • Significant heritage and strata redevelopment constraints. • Neighbourhood character areas to be preserved.	• Significant plot ratio capacity. • Significant bonus plot ratio opportunities. • Boosted by EQ and PCL redevelopment areas.
Northbridge	• Land use constraints (special entertainment precinct). • ~50% commercial market. • Neighbourhood character area to be preserved.	• Significant plot ratio capacity. • Eastern Northbridge development opportunities largely unconstrained. • Significant BPR opportunities.
East Perth	• Moderate heritage and strata redevelopment constraints. • Terrace road character areas to be preserved.	• Predominantly residential market. • Boosted by Riverside redevelopment area.
Claisebrook	• Neighbourhood character areas to be preserved. • Built-up small landholdings constrain comprehensive redevelopment. • No planning framework over redevelopment areas. • Limited bonus plot ratio opportunities.	• Predominantly residential market. • Long-term growth capacity in Development WA areas. • TOD redevelopment potential (McIver/Claisebrook stations). • Growth opportunities surrounding Wellington Square.
West Perth	• ~50% commercial market. • Neighbourhood character areas to be preserved.	• Significant unconstrained development capacity. • Currently low density – potential to increase. • Significant bonus plot ratio opportunities. • TOD redevelopment potential (City West).

	Constraints	Opportunities
		• Growth opportunities along Kings Park Road. • Highly accessible.
Crawley-Nedlands	• Built-up small landholdings constrain comprehensive redevelopment. • Currently no bonus plot ratio opportunities. • Neighbourhood character areas to be preserved.	• Predominantly residential market. • Currently low density – potential to increase in targeted areas. • Surrounding university and hospital precincts.

After reviewing the population distribution reference models against the neighbourhood constraints and opportunities, the following neighbourhood population targets were generated (refer to **Table 9**).

Table 9 - Neighbourhood population target breakdown

	Central Perth	Northbridge	East Perth	Claisebrook	West Perth	Crawley-Nedlands	Total
Existing population (Forecast. id, 2016)	5,672	2,053	7,288	3,938	2,858	5,141	26,950
Existing dwellings (Forecast. id, 2016)	2,596	928	3,651	1,945	1,608	1,554	12,282
2036 population target	12,375	4,125	15,125	6,875	9,625	6,875	55,000
% of total population target	22.5%	7.5%	27.5%	12.5%	17.5%	12.5%	100%
2036 dwelling target[1]	6,219	2,019	7,776	3,516	5,326	2,421	27,277

Each neighbourhood target generally falls within the range of the three reference models illustrated in **Figure 13**, with specific exceptions.

A higher population target was chosen for West Perth due to its significant redevelopment opportunity areas, residential amenity, accessibility and its opportunities for increased residential development capacity. A slightly lower target was chosen for Northbridge given that residential development will be constrained throughout large portions of the neighbourhood due to noise mitigation requirements from the Special Entertainment Precinct (refer section 8). A slightly higher population target was chosen in East Perth due to the significant residential growth targets envisaged within Development WA's Riverside redevelopment area.

Overall, with strategic planning scheme and policy interventions, each neighbourhood is considered capable of accommodating the above population targets by 2036.

[1] Dwelling target = (additional population/average household size) + existing dwellings

Dwelling yield and residential floorspace demand

To ensure that there is sufficient capacity for the population targets above, it is important to understand the extent of residential floorspace required to accommodate the targeted additional population. **Table 10** calculates the additional dwelling yield and residential floorspace growth requirements for each neighbourhood based on the following assumptions:

- Population based on **Table 9** targets;
- Neighbourhood average household size based on id.Forecast projections to 2036 (Forecast. id, 2021); and
- Average new dwelling supply based on recent trends (80sqm) (Urbis, 2017).

Table 10 - Residential Floorspace Growth Targets to 2036

Neighbourhood	Additional Population to 2036	Average Household Size	Additional Dwellings Required	Additional Residential Floorspace Demand (m^2)
Central Perth	6,703	1.85	3,623	289,859
Claisebrook	2,937	1.87	1,571	125,647
Crawley-Nedlands	1,734	2	867	69,360
East Perth	7,837	1.9	4,125	329,979
Northbridge	2,072	1.9	1,091	87,242
West Perth	6,767	1.82	3,718	297,451
TOTAL	28,050	n/a	14,994	1,199,538

A floorspace capacity analysis for each neighbourhood is provided in section **Error! Reference source not found.**, w hich considers both residential and commercial floorspace demand to 2036.

1.2. Community, urban growth and settlement

1.2.1. Existing profile and trends

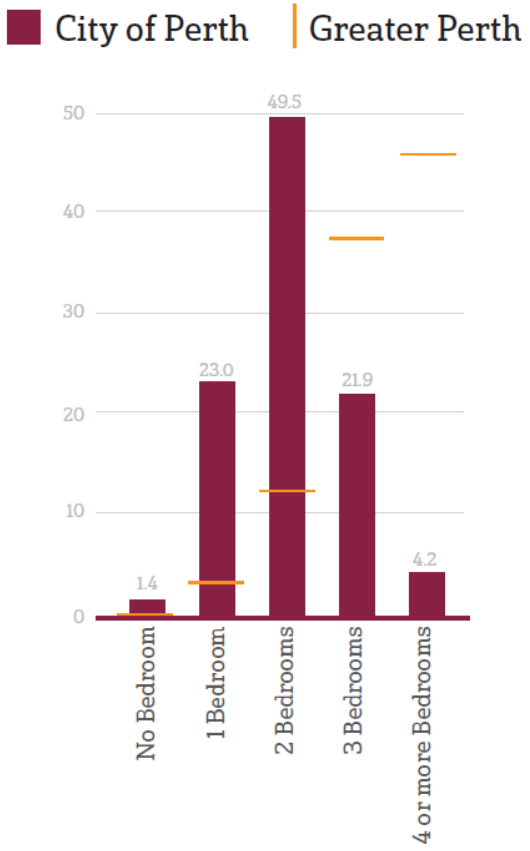
1.2.1.1. Housing

There were 14,943 dwellings in the city in 2016, roughly 52 dwellings per hectare. Approximately 8,237 additional dwellings were constructed between 2004 and 2016, an increase of 123% over the 12-year period, or 6.9% annually (Australian Bureau of Statistics, 2001 – 2016).

Medium and high-density dwellings account for 95.4% of the housing stock within Perth city (Profile. id, 2017) – a characteristic shared with other capital city locations. ABS Census data classifies medium density as one or two-storey units and high density as three storeys or more.

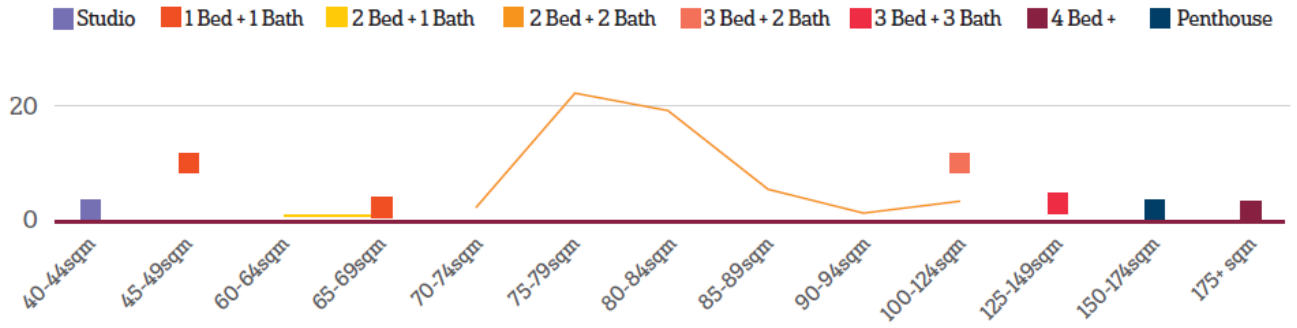
The overwhelming majority (94.4%) of dwellings in the city have between one to three bedrooms, with two bedroom dwelling representing almost 50% of all housing stock. This contrasts with Greater Perth, which sees much higher levels of three and four bedroom dwellings as illustrated in **Figure 14**.

Figure 14 – Bedrooms per dwelling, Perth city as benchmarked against Greater Perth (Australian Bureau of Statistics, 2016)



From 2016–17, apartment sales for Greater Perth indicate that one-bedroom apartments tended to be approximately 50sqm in size, though some one-bedroom apartments reached 70sqm in size. The majority of two-bedroom apartments were between 75sqm and 85sqm in size, though there were a number of two-bedroom apartments larger than 100sqm. Three-bedroom apartments tended to be between 100 and 149sqm in size (refer Figure 15). These sizes are similar to Greater Perth apartments, apart from a higher amount of Greater Perth three-bedroom apartments being larger than 125sqm.

Figure 15 - Apartment sizes in the Perth city (sales recorded between Q4 2016–Q4 2017) (Urbis, 2017)



Housing affordability and activity trends

Perth city experiences a cyclical housing market. A strong residential market in the early 2000s led to high levels of development and a steady growth in the median price of all dwelling types. Overall, median dwelling prices in Perth city are relatively high, in comparison to Greater Perth (refer to **Table 11**). However, the median sale price of dwellings in the city has generally been falling since 2012, and the volume of sales has decreased in line with the softening market (refer **Figure 16**) (Urbis, 2017).

Generally, apartment development has come in waves because of market conditions, policy changes and the availability of opportunities such as redevelopment precincts. Much of Perth city is zoned for mixed-use development – meaning that the feasibility of residential development is affected by the demand for other land uses (notably office space).

Figure 16 - Median price and sales by dwelling type in Perth city 1990-2017 (Urbis, 2018)

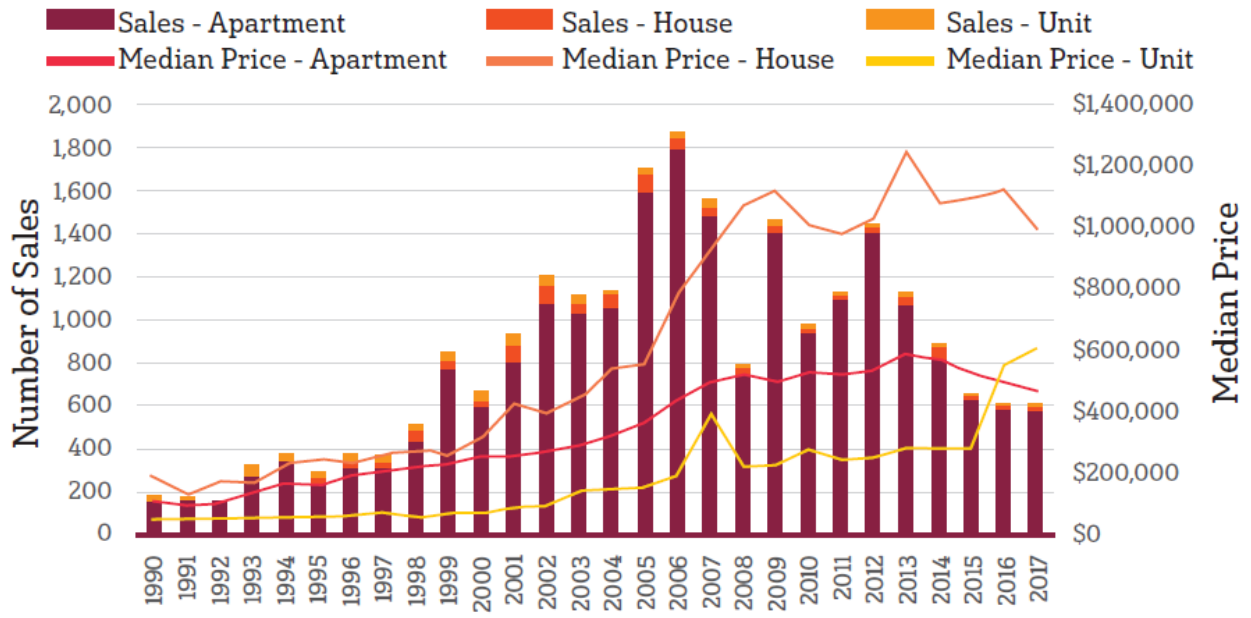


Table 11 - Median price by property type in Perth city vs. Greater Perth (Urbis, 2018)

Property Type	Perth city	Greater Perth
Apartment	$465,000	$390,000
House	$1,000,000	$493,000
Unit	$605,000	$420,000

Over half of all dwellings (57.8%) in Perth city are rented privately and an additional 7.3% are either publicly rented or are another form of rental. Rents are relatively high compared to Greater Perth, with 23.8% of rented dwellings costing renters over $550 a week (Urbis, 2018). This proportion is more than double than that of Greater Perth – and demonstrates the premium offer of the city. Perth city also sees a relatively high amount of social and community housing (4.4%) compared to the Greater Perth average (3.1%) (Profile. id, 2017).

While Perth city residents are relatively wealthy on average, housing affordability and suitability is an ongoing issue for some city residents. Some evidence suggests that rental and mortgage stress is the same, or below, Greater Perth averages as shown in **Table 12**. However, housing suitability is an issue for some, with 5.8% with 5.8% of households in Perth city indicating a requirement for more beds, compared to 2.3% across Greater Perth (refer to **Table 12**).

Whilst Perth city has seen significant population growth, there are complicated challenges in providing housing for people who are socially and economically disadvantaged. On Census night in 2016, there were 9,005 persons classified as homeless in WA and during RUAH Community Services Perth Registry Week in February 2016, 430 people identified as being homeless in Perth city (RUAH Community Services, 2016).

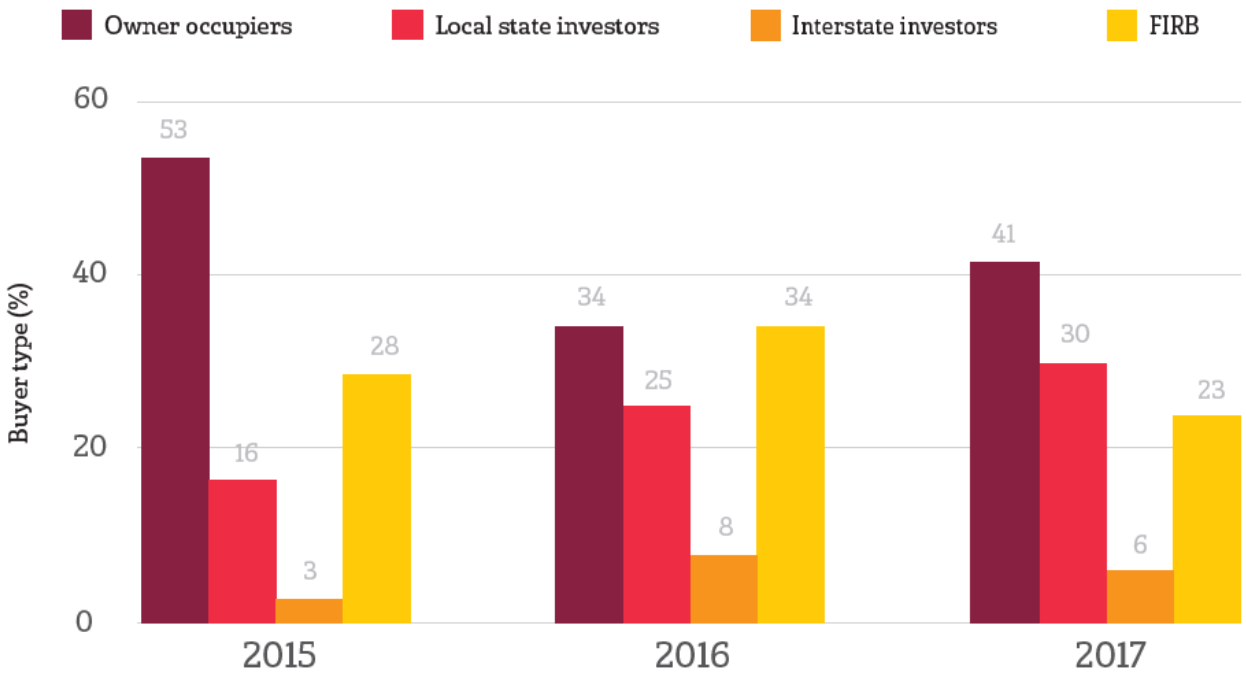
Table 12 - Housing affordability metrics as at 2017 (Urbis, 2018)

Housing affordability metrics	Perth city (%)	Greater Perth (%)
Households receiving rent assistance	16.3%	13.8%
Mortgage stress (% of households)	7.8%	7.1%
Rental stress (% of households)	21.5%	30.0%
Proportion of households requiring extra beds	5.8%	2.3%

Purchaser trends

Apartment buyers in Perth city continue to be investors more so than owner-occupiers – with investors accounting for 59% of buyers in 2017 (refer to **Figure 17**)(Urbis, 2018). The makeup of the investor market shifted over 2015-2017, with the number of foreign investors falling from 60% of investors in 2015 to 39% of investors in 2017. This likely reflects the broader decline in foreign investment experienced across Australia between 2016 and 2017, rather than local market factors.

Figure 17 - Buyer profile of apartments in Perth city 2015-17[(Urbis, 2017) 2]



Housing target

As outlined in Section 1.1.1.2, to achieve a population of 55,000 by 2036, the City aims to accommodate approximately 15,000 new dwellings. Dwelling targets for each neighbourhood are provided in Table 13.

Table 13 - Neighbourhood dwelling targets to 2036

	Central Perth	Northbridge	East Perth	Claisebrook	West Perth	Crawley-Nedlands	Total
Existing dwellings (Forecast. id, 2016)	2,596	928	3,651	1,945	1,608	1,554	12,282
Additional dwellings (2036)	3,623	1,091	4,125	1,571	3,718	867	14,995
Total dwelling target (2036)	6,219	2,019	7,776	3,516	5,326	2,421	27,277

1.2.1.2. Community infrastructure

Community infrastructure provides opportunities for a range of social and recreational activities and lays the foundation for a strong and connected community.

Given the significant resident population growth envisaged for the city it is important to ensure that there is adequate community infrastructure for the future.

Community infrastructure planning is traditionally based on forecasting resident needs. In a capital city

[2] FIRB stands for the Foreign Investment Review Board. Foreign investors generally need to apply for approval from FIRB before purchasing residential property in Australia.

environment, consideration needs to be given to not only residents but the many workers, students and visitors that the city attracts. It also

In the absence of multi-user benchmarking suitable for a capital city, the City has undertaken benchmarking of community infrastructure based on the City's resident population forecasts and targets (City of Perth, 2020). The current provision of community infrastructure and additional community infrastructure that is likely to be required by 2036 to support the city's residents is set out below.
This benchmarking does not consider non-resident users or community infrastructure provision in adjoining local government areas so should be considered a starting point for further considering the city's community infrastructure needs and how these will be delivered will occur in preparing the City's Community Infrastructure Plan. It should also be acknowledged that there are a range of regional-level institutions and facilities that cater for a broad range of users including the city's residents.

It should be noted that the City along with the State and Federal Governments are working with the WACA on future opportunities to include a multi-purpose sports venue and public pool as part of the Perth City Deal.

Child care

There are currently nine child care services in the city that offer long day care, providing approximately 756 child care places. Family day care is another type of child-care, which operates within the home of the educator. There are currently no registered family day-care services located within the city.

Benchmarking for the provision of long day care to 2036 is provided in **Table 14**.

Table 14 - The provision of long day care within Perth city – benchmarked

Provision Benchmark - Children aged 0-4 years, at a rate of around 2.5 places for each resident child (City of Parramatta, 2017)					
	Existing		**2036**		
Neighbourhood	**Population**	**Provision (places)**	**Population (forecast)**	**Population (target)**	**Provision surplus/deficit**
Central Perth	199	231	322	343	+97 – +102
Northbridge	23	93	137	198	+35 – +38
East Perth	277	70	484	570	-124 – -210
Claisebrook	124	0	172	398	-69 – -81
West Perth	108	140	143	145	+8 – +83
Crawley-Nedlands	158	222	147	153	+162 – +163

This analysis suggests that there may be current and future demand for additional childcare in East Perth and Claisebrook. By 2036, this would be in the order of approximately 200 – 300 places in total. Notwithstanding, it is noted that additional childcare centres are available in neighbourhood local government areas which may capture some of the demand from East Perth and Claisebrook residents.

Population growth in other neighbourhoods is unlikely to result in a shortage of childcare places. Although Central Perth, West Perth and Crawley-Nedlands appear to be oversupplied, current provision is likely due to the high proportion of workers in these areas. It will be important that any future Community Infrastructure Plan considers the additional childcare demand generated by workers with children.

Primary schools

Primary school is an essential and compulsory service for children and their families. Schools often form an important role in a neighbourhood, fostering community and providing a place for events and activities outside of school hours.

There are no public schools operating in Perth city, although a private primary school is provided at Trinity College, from year 4 onwards. The city is split into five public primary school intake areas that are located just outside of Perth city (Nedlands, Hollywood, Subiaco, West Leederville and Highgate).

Benchmarking for the provision of public primary schools to 2036 is provided in **Table 15**.

Table 15 - The provision of public primary schools - benchmarked

Provision Benchmark – One primary school per 400 children aged 5-11 years[3]					
	Existing		2036		
Neighbourhood	**Population 5-11 years**	**Provision of public primary school**	**Population 5-11 years (forecast)**	**Population 5-11 years (target)**	**Provision surplus/deficit**
Central Perth	83	0	155	161	Nil
Northbridge	15	0	30	32	Nil
East Perth	121	0	303	438	Nil – 1 primary school
Claisebrook	79	0	148	174	Nil
West Perth	60	0	68	157	Nil
Crawley-Nedlands	164	0	147	149	Nil
Total – Perth city	*522*	*0*	*851*	*1111*	*2 primary schools*
Total – Central Perth, East Perth, Claisebrook	*283*	*0*	*606*	*773*	*1 primary school*

There are currently 522 children aged 5-11 years living in Perth city. While this is enough to fill an average-sized primary school, this population is dispersed across five existing catchment areas.

The combined 5-11-year-old population across Central Perth, East Perth and Claisebrook is anticipated to reach between 606 – 773 by 2036. Currently, these areas are part of the Highgate Primary School Local Intake Area which is understood from the Department of Education to be experiencing high enrolment levels in recent years. Therefore, it is highly likely that these areas will require an inner-city primary school in the near future. The benchmarking suggests that East Perth alone could require a primary school by 2036 if population targets are met

A new public primary school may also help attract more families into the city and could provide a place that the rest of the community can use.

[3] Western Australian average primary school size

The total 5-11-year-old population across Perth city is anticipated to reach between 851 – 1,111 by 2036. Although this suggests that a second inner-city primary school may be needed by 2036, it is important to consider that a portion of this population is likely to continue to attend public primary schools outside of Perth city, as well as private primary schools.

Secondary schools

Secondary education is compulsory up until the end of the year young people turn 17 and 6 months in Western Australia. It is therefore assumed that demand for government schools will be close to the total number of residents between 12 – 17 years, with some residents choosing to attend private schools. The average secondary school size in WA is around 1,000 children. School size is, however, highly variable, with some Perth schools nearing 2,000-3,000 students.

There are no public secondary schools operating in Perth city however three private high schools – Mercedes College, St George's Anglican Grammar School and Trinity College – are in Central Perth and East Perth. Crawley-Nedlands and West Perth are currently part of the local intake area of Shenton College, while the rest of Perth city is part of the intake area of Mount Lawley Senior High School. All Perth city neighbourhoods also fall into the intake area of Bob-Hawke College, except for Nedlands-Crawley, which remains in the Shenton College catchment.

Benchmarking for the provision of secondary schools to 2036 is provided in **Table 16**.

Table 16 - The provision of secondary schools - benchmarked

Provision Benchmark – One secondary school per 1000 persons aged 12-17 years[4]					
	Existing		2036		
	Population 12-17 years	Provision of public secondary schools	Population 12-17 years (forecast)	Population 12-17 years (target)	Provision surplus/deficit
Total – Perth city	440	0	1,021	1,305	- 1 secondary school

There are not many people of secondary-school age living in Perth city currently. Although the population aged 12-17 is predicted to reach over 1,000 people by 2036, it is anticipated that the majority of this catchment will attend the new Bob Hawke College which is highly accessible from most parts of the city – especially areas close to a train station. Furthermore, a portion of this population will likely attend private secondary schools. It is therefore unlikely that a government secondary school will be needed in the city during the life of this Strategy.

However, should the City and surrounding local government areas continue to accommodate strong population growth, it is likely that a secondary school will be needed within Perth city at some stage beyond 2036. As such, it would be wise for the City to work with the State Government now to find potential sites for a school, for development in the future.

Tertiary education

Several universities have a presence within Perth city. The main campus of the University of Western Australia is in Crawley, providing undergraduate and postgraduate courses to almost 24,000 students. Curtin University and Central Queensland University also operate some courses from Perth city locations. The city also has two North Metropolitan TAFE campuses and around 55 private training colleges.

The Perth City Deal (Department of Infrastructure, Transport, Regional Development and Communities, 2020) announced in 2020 proposes to expand the presence of university campuses in Perth city through the following:

[4] Western Australian average high school size

- Relocating Edith Cowan University's law and business schools, along with the Western Australian Academy of Performing Arts, into Perth city; and
- Expanding or establishing new inner-city presences for Curtin and Murdoch Universities.

There are no established benchmarks for the provision of tertiary education facilities at a local government level, and today's universities operate on models that extend their reach internationally. These institutions attract thousands of visitors (students and workers) each day and encourage residential growth (as students try to live near their place of study).

Residential aged care

Residential aged care services provide accommodation and a range of support services for older people who can no longer live at home. The aged care sector has changed a lot over the past twenty years, with in-home care and a trend to larger facilities for residential aged care. The provision of residential aged care is important for allowing 'ageing in place' where people can remain in their neighbourhood when they are no longer able to live on their own.

There are currently two residential aged care facilities known to operate within Perth city, located in East Perth and Claisebrook. In total, these facilities provide around 80 places (refer to **Table 17**).

Table 17 - Provision of residential aged care – benchmarked

Provision Benchmark – 73 places per 1,000 people aged 70 years and over[5]					
	Existing		2036		
Neighbourhood	**Population 70+ years**	**Provision (places)**	**Population 70+ years (forecast)**	**Population 70+ years (target)**	**Provision surplus/deficit**
Total – Perth city	1,691	80	3,581	4,578	-181 – -254

This analysis suggests that there is currently a small shortfall of residential aged care places within Perth city. By 2036, this shortfall is predicted to increase to 181-254 places – which would mean two to three additional facilities would be needed (as most facilities provide 80 or more places). The City should consider how aged-care development could be further encouraged to increase the diversity of the resident population.

Community centres

Community centres provide space for a range of community activities, services and programs. These could include community health services, youth services, as well as a variety of recreational activities and programs. Community facilities are also often provided in apartment buildings. In locations of high density, which is most of Perth city, there may be more need for nearby internal and external spaces that can host events that might otherwise take place in the home. Nationally, there is a trend away from smaller neighbourhood facilities to larger multi-purpose facilities, to benefit from 'economies of scale'. Community centres are usually built and maintained by local government authorities or not-for-profit organisations.

The City currently owns three formal community centres:

- The Citiplace Community Centre – located in the City Railway Station Complex at Wellington St. The centre has a large conference room, small conference room, and dining room that are can be hired for community use as well as end of trip facilities and stroller/wheelchair hire. It currently provides a range of activities and services for people over the age of 55 and people with disabilities;
- The Rod Evans Centre – located on Plain St, East Perth. This centre was used to offer services for people

[5] Australian Government provision ratios

over the age of 55, but closed in December 2016. The future of this centre has not yet been determined; and

- City of Perth library – located on the corner of Hay Street and Cathedral Avenue. In addition to typical library services, additional community centre functions are available including meeting spaces, a dedicated young adult space, and a venue for community events.

In addition to the above, there are various community and cultural spaces provided by the City, not-for-profit agencies, state government authorities and private institutions throughout the Perth city including the following:

- Hellenic Community Centre, Northbridge (not-for-profit) – offers a playgroup, language and cultural classes, and opportunities for volunteering;
- Chung Wah Hall, Northbridge (not-for-profit) – the Chung Wah Hall can be hired as a venue for events;
- Perth Cultural Centre (State Library, Art Gallery, WA Museum) – provides meeting places, exhibitions, events and activities, including for families and children;
- Tattersalls Bowling Club, East Perth (City of Perth owned);
- Northbridge Piazza City of Perth owned);
- Perth Town Hall – is available for venue hire, and is suitable for a range of events including concerts, weddings and exhibitions; and
- UWA-QEII facilities – various meeting places, events and community services provided on UWA-QEII facilities which are available to the public.

The City's community facilities are shown on **institutions.**

Figure 18.

Community infrastructure benchmarking varies due to the diverse range of facilities provided in terms of size and use. A review of Australian case studies revealed a typical benchmarking range of one community centre per 5,000 – 10,000 residents, depending on the scale of the centre (City of Perth, 2020). Preliminary benchmarking based on this range is provided in **Table 18**.

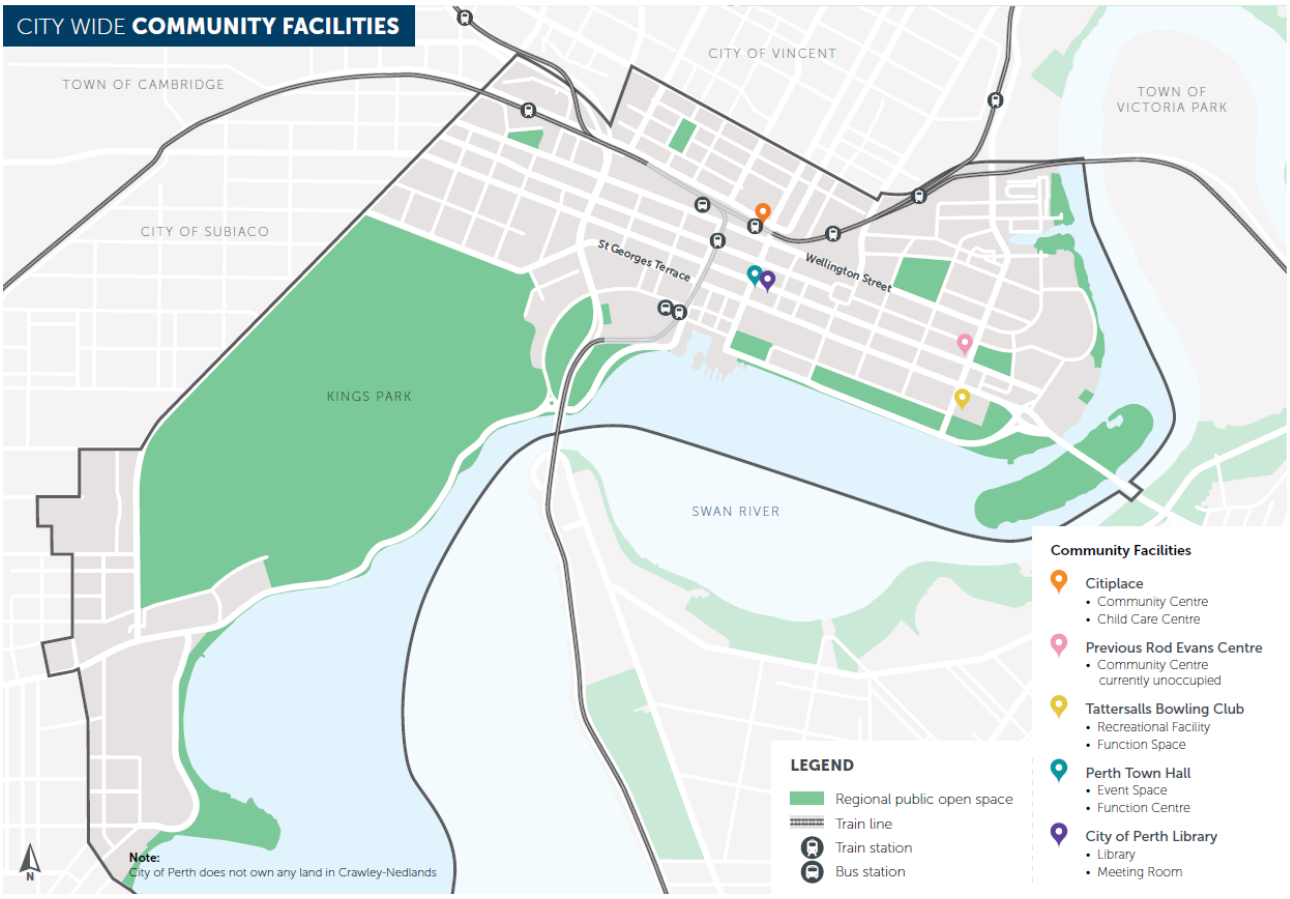
Table 18 – Provision of community centres - benchmarked

Provision Benchmark – One community centre per 5,000 residents					
	Existing		2036		
Neighbourhood	**Population 2016**	**Provision**	**Population (forecast)**	**Population (target)**	**Provision surplus/deficit**
Central Perth	5,672	Citiplace Community Centre, City of Perth Library, Perth Town Hall.	11,915	12,375	Nil
Northbridge	2,053	Two not-for-profit centres, Perth Cultural Centre and Northbridge Piazza	3,867	4,125	Nil
East Perth	7,288	Rod Evans Centre (currently closed), Tattersalls Bowling Club.	19,466	15,125	- 1-2 community centres.
Claisebrook	3,938	Nil	5,840	6,875	- 0-1 community centre

West Perth	2,858	Nil	3,869	9,625	- 0-1 community centre.
Crawley-Nedlands	5,141	Nil – (UWA-QEII facilities)	6,770	6,875	0-1 community centre

The analysis above suggests a current need for a community centre in East Perth and possible future need for additional centres in Crawley-Nedlands, Claisebrook and West Perth. This preliminary benchmarking should be expanded on as part of a future Community Infrastructure Plan by reviewing the suitability of existing centres for a broad range of services to canter to meet community needs. Furthermore, the future study should examine supplementary community infrastructure and services which are offered by private institutions.

Figure 18 – Community Facilities



Other community infrastructure

The following facilities were also examined as part of the Community Infrastructure study:

- **Youth centre / space** – there are no youth centres in Perth city. Other local government areas are incorporating these spaces into multi-purpose community centres, and this may be an option for the City in the future;
- **Aquatic Facilities** – there are no aquatic centres located in Perth city and the current resident population is below the benchmark (1 centre per 75,000+ residents depending on facility size) for provision of such facilities (City of Perth, 2020). Notwithstanding, the City Deal's proposed WACA redevelopment includes an inner-city public swimming pool. UWA pools are also are available to the public during certain hours. Additionally, Beatty Park (North Perth) and Aqualife (Victoria Park) are close to some Perth city neighbourhoods;
- **Indoor sport and recreation centre** – there are no public indoor sport and recreation centres located in Perth city. As with aquatic facilities, the current resident population of Perth city is below the benchmark for the provision of these facilities (one centre for every 50,000-100,000 people). However, the City Deal's WACA redevelopment proposes publicly accessible sporting facilities in conjunction with the swimming pool. Additionally, there may be opportunity for some active recreation provided through community centres. Lords (Subiaco), Loftus Recreation Centre (Leederville), The RISE (Maylands) and Leisurelife (Victoria Park) also provide services surrounding the city;
- **Skate / BMX park** – there are currently no formal skate/BMX parks in Perth city. The draft Wellington Square Master Plan includes a young adult's pump track which can be used for skating and BMX riding. The provision benchmark is one for every 25,000-50,000 residents; and
- **Playgrounds and park equipment** - a 2017 audit found there were nine playgrounds in the city, of which four were in East Perth. Six parks have outdoor gym sets (two in Central Perth, one in East Perth, and three in Claisebrook), and two parks in the city have outdoor sporting courts (at Claisebrook and Crawley). New recreational facilities are also planned as part of the redevelopment of Wellington Square including a playing field, tennis courts, basketball courts and playgrounds. Benchmarks for provision of these facilities are not well established.

Health and community services

Given its important role as a capital city, Perth city has a broad range of health and community care support services, including those that cater for vulnerable and disadvantaged groups. Residents may benefit from easy access to these regional services. The city is also home to a high number of Aboriginal services and organisations, which would see large numbers of Aboriginal and Torres Strait Islander peoples visiting Perth each day. **Table 19** shows the details of a desktop audit undertaken in 2016, which identified the following health and community services in Perth city:

Table 19 - Provision of health and community services

Service	Number
Private hospitals	3
Public hospitals	3
General practice clinics	20
Crisis support (including homelessness and youth support) services	18
Counselling services	28
Mental health services	35
Drug and alcohol support services	16

Service	Number
Aboriginal health services	4
Women's health services	10
Child health centre	2
Disability support services	14
Supported accommodation services for people disabilities	2
Job seeker support services	9

1.2.1.3. Public open space

Perth city has approximately 546.7 hectares of public open space (POS), which represents 39.7% of City's total land area In this context, public open space is defined as open green areas, owned and/or managed by the City, that are primarily used to meet the passive and active recreational needs of city residents, workers and visitors – all while providing a range of environmental, socio-economic and cultural benefits and services.

In 2018 the City completed an Open Space Study which classified Perth city's public open space according to the hierarchy shown in **Figure 19** (City of Perth, 2018[a]).

Figure 19- POS hierarchy categories used for Open Space Study 2018

The city's public open space includes parks and gardens (at a city and neighbourhood scale), the river foreshore, bushland areas and parts of the city's freeway and railway reserves as shown in **Table 20**.

Table 20 - Classification of significant POS reservations across the City of Perth

Open space name	Hierarchy	Area(ha)	Key amenity
Kings Park			
Central Perth			

Florence Hummerston Reserve	Micro	0.18	Seating
John Oldham Park	Neighbourhood	6.5	Playground, lake
David Carr Memorial Park	Regional	5.7	Lake, dual use path
Jacobs Ladder Park	Micro	0.24	Stairs
Swan River Foreshore (Brewery to EQ)	Regional	2.9	Dual use path
Narrows Interchange	District	6.2	Turf/trees
Mount Street North	Micro	0.13	Turf/trees
Supreme Court Gardens	Capital city	2.96	Lake, seating
Stirling Gardens	Capital city	1	
Council House Gardens	Regional	0.56	
Swan River Foreshore	Regional	0.75	Dual use path
Railway Reserve Perth (Wellington St)	Micro	0.19	Seating
Swan River Foreshore	Regional	3.6	Dual use path
Kings Park*	Capital city	420	Memorial, playground, bushland
Northbridge			
Russell Square	Neighbourhood	2.13	Seating pagoda
James Street (State Library)	Micro	0.01	Playground
East Perth			
Langley Park	Capital City	11.2	Open turf
Lake Vasto / Ozone Reserve	District	6.68	Playground, lakes, turf, shelter
Point Fraser	District	5.5	Seating, foreshore lookout
Queens Gardens	District	3.54	Open grounds, shelter, seating
Hay Street East Park	Micro	0.19	Playground, BBQ, seating
East Perth Foreshore	Regional	1.22	Dual use path, fitness
Tattersalls Bowling Club	Local	0.47	Sport grounds, facilities
Rod Evans Park	Local	0.57	Turf, seating, path network
Swan River Foreshore	Regional	1.7	Dual use path
Heirisson Island	Capital city	32.3	Path network,
Claisebrook			
Wellington Square	District	7.75	Ovals, path network, facilities
Pioneer Gardens	Local	0.34	Seating
Haig Park Place (South)	Micro	0.05	Seating

Haig Park Place (North)	Micro	0.09	Seating
Victoria Gardens	Neighbourhood	2.58	Shelter, BBQ, furniture
Old Belvidere Prom Median	Local	0.21	Seating
Henry Lawson Walk	Local	0.3	Seating, path network
Beacon Terrace PAW	Micro	0.04	Seating, path network
Regal Place Plaza	Micro	0.07	Seating
137 Royal Street	Micro	0.06	Seating, water feature
Mardalup	Neighbourhood	2.9	Path, playground, courts, BBQ
Peace Park	Neighbourhood	2.3	Path, exercise, BBQ
Claisebrook Creek Reserve	Neighbourhood	1.9	Path, BBQ, playground
Mardalup Park (Northern Extension)	Local	0.36	Dual use path
Railway Reserve East Perth (GF Fwy)	Local	0.47	Dual use path
West Perth			
Totterdell Park	Neighbourhood	0.77	Playground, lake, open turf
Harold Boas Gardens	Neighbourhood	2.0	Playground, open turf, seating
1326 Hay Street	Micro	0.08	Turf and seating
Frank Baden Powell Park	Micro	0.05	Seating
1333 Hay Street	Micro	0.12	Turf and seating
Murray Thelma Reserve	Micro	0.25	Seating
Crawley-Nedlands			
Swan River Foreshore	District	2.16	Path network, seating shelter
Wingfield Ave PAW	Micro	0.1	Seating
JH Abrahams Park	District	5.3	Playground, BBQ, boat ramp
Total		**546.7**	

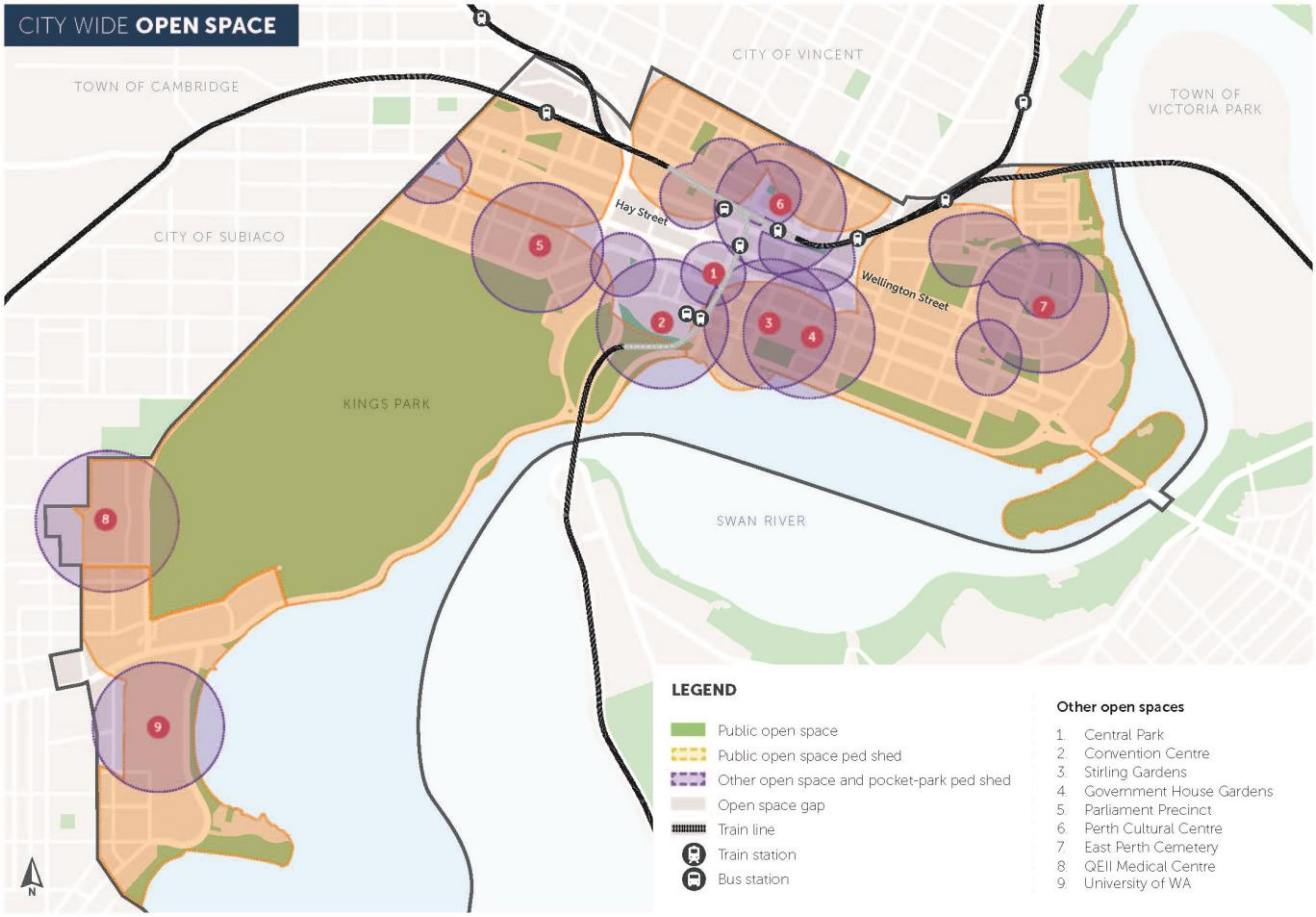
In addition to the public open space which is owned and/or managed by the City, there are significant open space areas located on land which is managed by the State government and private institutions including:

- Government House Gardens;
- Parliament Precinct;
- Perth Cultural Centre;
- Convention Centre;
- Perth Cultural Centre;
- East Perth Cemeteries;
- QEII Medical Centre; and
- University of Western Australia.

There are also numerous open spaces integrated into development on private land which are open to the public. Key examples of these spaces include Central Park, Brookfield Place, Raine Square and QV1 Plaza. These have been generally established on private land in exchange for bonus plot ratio and are therefore only required to be maintained for the life of a development.

Figure 20 illustrates the city's public open space areas as well as key private and state managed open space areas. The plan demonstrates Kings Park provides the majority of the public open space, along with reserves along the Swan River foreshore, with pockets located throughout the rest of the City. **Figure 20** illustrates 200 – 400m walkable catchments (PedSheds) around each open space according to their hierarchy, in accordance with the City of Perth Open Space Study. Capital city, regional, district, neighbourhood and local public open space PedSheds have been distinguished from microparks and other open spaces due to differences in their prominence and function.

Figure 20 – Open space plan



Perth City has the highest proportion of public open space per resident/worker, compared to Melbourne and Sydney (refer to **Table 21**). It is worth noting that Perth has over twelve times the amount of public space land area per resident/worker than Sydney.

Table 21 - Amount of POS in three Australian capital cities (City of Perth, 2018[a]; Colliers International, 2019; Forecast.id, 2016)

City	Total land area (ha)	Total residents	Total workers	POS area (ha)	Total land area (%)	POS area per resident (m^2)	POS area per resident and worker (m^2)
Perth	1,377	26,950	149,009	546.7	40	203	31
Melbourne	3,770	93,627	360,330	555	15	59	12
Sydney	2,672	205,3339	437,727	386	15	18	6

Whilst the city has a significant amount of public open space, particularly when compared to other capital cities, the distribution of green space is unbalanced – with large percentages of open space provided in East Perth, Claisebrook and Central Perth, and significantly smaller proportions in the remaining neighbourhoods. The concentration of POS across each neighbourhood is provided in **Table 22**.

East Perth has the highest proportion of POS at 35.6%. Northbridge and West Perth have the lowest concentration of POS at 2.5% with only 2.0% of the neighbourhood's land area formed by green space.

Table 22 - Concentration of POS by neighbourhood

	Central Perth	Northbridge	East Perth	Claisebrook	West Perth	Crawley-Nedlands
Total POS area (ha) (City of Perth, 2018[a])	30.91	2.14	63.37	19.42	3.27	7.56
Total land area (ha) (Profile.id, 2021)	247	85	178	114	133	200
Population (2016)	5,672	2,053	7,288	3,938	2,858	5,141
POS concentration (% of total land area)	12.5%	2.5%	35.6%	17%	2.5%	3.8%
POS per resident (m^2)	54.5	10.4	86.9	11.5	11.4	14.7

1.3. Economy and employment

1.3.1. Existing profile and trends

1.3.1.1. Capital City

Perth city is WA's capital and primary centre for commercial, civic, cultural, administrative and tourism services. This key economic role attracts approximately 205,750 visitors (City of Perth, 2016) and 134,500 workers (REMPLAN, 2021) on a typical weekday.

The *City of Perth Act 2016* formally the economic, social, cultural and civic role that the Perth city plays as the capital of WA. The Act promotes the continued growth of the city to ensure its continued role as a thriving centre of business with vibrant cultural and entertainment precincts, having due regard to the flow-on impact on the Perth metropolitan area.

The majority of land within Perth city is identified as part of the 'Perth Capital City' activity centre under State Planning Policy 4.2 (SPP 4.2), which is the highest-order centre for the Perth and Peel region. The areas identified as 'Perth Capital City' include Central Perth, West Perth, Northbridge and East Perth. The UWA-QEII precinct is separately identified as a 'specialised centre' under State Planning Policy 4.2.

State Planning Policy 4.2 identifies general characteristics for Perth Capital City, however, unlike other activity centre hierarchies, no specific performance targets are prescribed. The general characteristics of the Perth Capital City activity centre are summarised in **Table 23**.

Table 23 - SPP 4.2 Perth Capital City activity centre characteristics

Characteristic category	Description
Main role/function	Perth Capital City is the largest of the activity centres, providing the most intensely concentrated development in the region. It has the greatest range of high order services and jobs, and the largest commercial component of any activity centre.
Transport connectivity and accessibility	Focus of regional road and rail infrastructure as well as radial bus network.
Typical retail types	• Department store/s. • Discount department stores. • Supermarkets. • Full range of speciality shops.
Typical office development	• Major offices. • Commonwealth and state government agencies.
Future indicative service population (trade) area	Greater metropolitan region.

The city's economy generates an estimated $83.2 billion in Gross State Product (GSP) which represents 22% of GSP generated in Greater Perth and 15% of GSP generated in Western Australia Australian Bureau of Statistics 2016, 2017, 2019). Perth city's Gross Regional Product (GRP) grew by 4.5% each year between 2009 and 2015. This was largely due to the significant contributions of the three strongest sectors – mining, professional, scientific and technical services, and finance (Colliers International, 2019). However, the dominance of these sectors had also in relatively low economic diversity. Recent economic growth in emerging tourism, education and food and beverage markets suggests potential for a more diversified local economy.

1.3.1.2. Hierarchy of activity

Whilst a mix of land uses are broadly promoted across the city, there areas with a specific economic focus. These are summarised in **Table 24**.

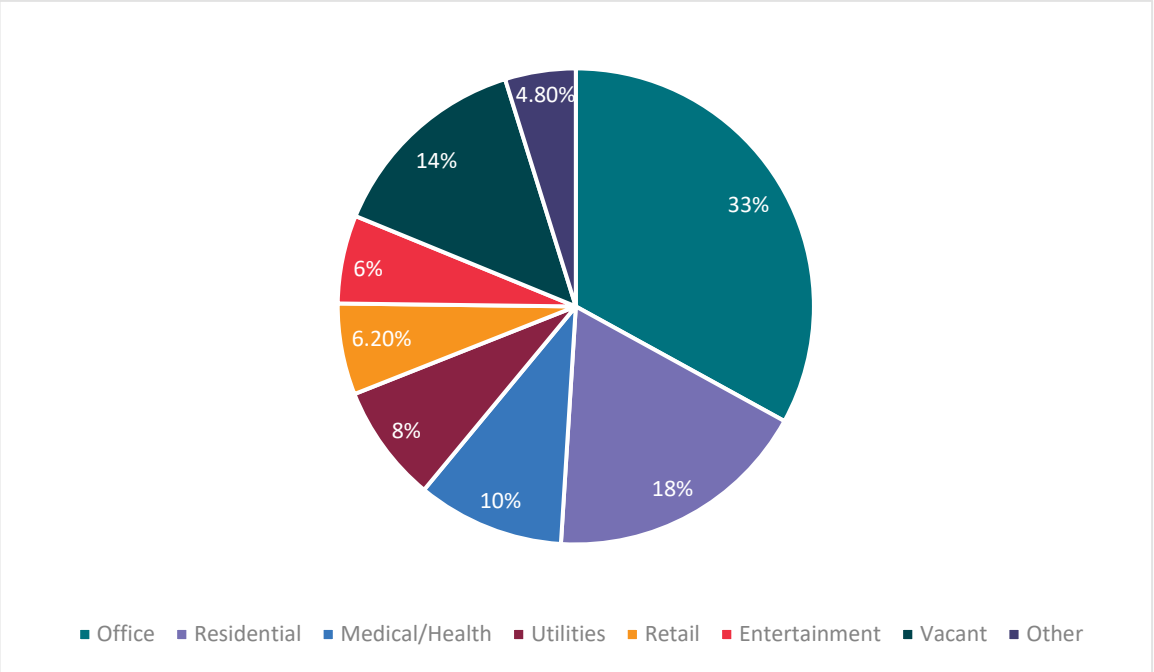
Table 24 - Perth city hierarchy of activity

Activity Focus Areas	Role
Primary Office (Central Perth)	The primary focus for office uses as the centre of commerce and administration for Greater Perth and the State.
Primary Retail (Central Perth)	The primary focus for retail uses for Greater Perth along with other uses such as food and beverage, entertainment and cultural uses which provide for day time, night time and weekend activity.
Primary Entertainment (Northbridge)	The primary focus for entertainment, cultural and creative uses for Greater Perth, along with a wide range of retail, food and beverage and cultural uses.
Secondary Office (West Perth)	Will accommodate a significant proportion of the city's offices.
UWA-QEII Specialised Centre (Crawley-Nedlands)	The focus for regionally significant economic and institutional activities as well as knowledge based industries supporting both health and tertiary education activities.
Neighbourhood Centres: • Royal Street (Claisebrook) • Hay Street East (East Perth) • Hay Street West (West Perth) • Broadway (Crawley-Nedlands) • Hampden Road (Crawley-Nedlands)	Provide for a range of goods and services to support the neighbourhood's daily and weekly needs.

1.3.1.3. Employment Land use

Over half (53%) of the total land area within Perth city is reserved (including crown leases such as UWA, the Old Swan Brewery and Perth Convention and Exhibition Centre). A further 18% of the land is reserved for transportation. This results in a remaining 29% of total land area within the city dedicated to a mix of land uses. The primary land uses are illustrated in **Figure 21**.

Figure 21 - Perth city primary land use breakdown (Intermethod, 2018)



Land-use density and intensity differs significantly across Perth city, with the highest concentration of commercial activity within the Central Perth (west), West Perth and Northbridge. Nedlands has the lowest, with only 2.0% of its floorspace used for commercial activity.

Education and medical is an important land use in Crawley-Nedlands. Education accounts for 44% of land use within Crawley, and hospital/medical accounts for 36% of total land use within Nedlands (Profile.id, 2016).

There is limited industrial activity within Perth city, accounting for less than 1.0% of its floorspace. Almost all the city's industrial activity is concentrated in Claisebrook, which was historical use of land was predominately industrial prior to redevelopment.

Office floorspace

Perth city contains approximately 2.3 million sqm of office floorspace which represents approximately 45% of the total office stock within Greater Perth. It is the most dominant activity across Perth city measured by floorspace and occupies an average of 2.9sqm of office space per sqm of land (Colliers International, 2019). The majority of Perth city's office floorspace (1.4 million sqm) is located within the CBD Core, which is the area bounded by Hay Street, Barrack Street, Mounts Bay Road and the Mitchell Freeway (refer to **Table 25** and

Figure 22).

Table 25 - Existing office floorspace by neighbourhood (Colliers International, 2019)

Neighbourhood	Occupied Stock (m^2)	Proportion of Total
Central Perth	1,431,548	62%
Northbridge	170,329	7%
East Perth	139,828	6%
Claisebrook	93,227	4%
West Perth	428,985	19%

Crawley-Nedlands	45,849	2%

Figure 22 – Office floorspace distribution across Perth city (Colliers International, 2019)

Most of the large-scale office development (predominately occupied by the mining and resource sector) is focused along St Georges Terrace between Mitchell Freeway and Barrack Street. Development in recent years has intensified office development to the western end of St Georges Terrace. A gradual shift towards the north and south of St Georges Terrace is also occurring, which will be strengthened by Elizabeth Quay and Perth City Link. The redevelopment of 140 William Street and Raine Square will create a strong continuous north-south link along William Street.

Secondary office precincts exist within East Perth and West Perth. East Perth has traditionally been occupied by State Government tenants, embassies and law-related firms. West Perth is home to many junior mining companies and other professional services (Colliers International, 2019).

Office vacancy

Whilst workforce numbers across all industries have steadily increased within Perth city, the change in economic climate, due to the end of the mining boom, has seen a significant workforce reduction in the resource sector and its supporting industries – which has had flow-on effect to office space demands in the city. This weaker demand for office space has coincided with the end of a decade-long period of office development, which saw over 800,000sqm of office floorspace developed across WA (Y Research, 2016). Because of lower demand and new supply, vacancy rates in the city reached 22.5% in early 2017. Between 2017-2018, office vacancy rates somewhat improved to 19.84% (Savills, 2018). However it is anticipated that vacancy rates have increased since Covid-19. Based on existing high-vacancy rates in Perth city, and the softer economic conditions, it is likely that supply will be constrained in the medium to longer term (Colliers International, 2019).

The amount of vacant office space estimated across each neighbourhood as at 2018 is outlined in **Table 26**.

Table 26 Office vacancy by neighbourhood

Neighbourhood	Vacant Office Stock (m^2)	Proportion of Total Neighbourhood Office Stock
Central Perth	330,171	23%
Northbridge	42,051	25%
East Perth	18,302	13%
Claisebrook	23,016	25%
West Perth	71,479	17%
Crawley-Nedlands	11,319	25%

The current oversupply of floorspace creates an opportunity for new businesses from a wide range of sectors to re-locate to the city. However, the grade of a building, and its location, has a significant impact on demand. Based on a demand and supply analysis undertaken by Colliers International, secondary grade building (which combine B, C and D grades) vacancy levels are likely to remain high. Whilst the vacancy rate for premium office space (mostly located in the CBD) was only 4.1% in 2018 (the lowest it's been since July 2014), high vacancy levels for the secondary office stock are a major concern. Because C and D grade buildings (representing 73.4% of building stock) are generally situated outside of the CBD core, they remain a less popular option (Colliers International, 2019).

The high vacancy rates and falling rents have encouraged an increase in refurbishments, in an effort to attract tenants. This is particularly relevant to C and D grade office buildings, where improvements to office space quality is becoming necessary to attract tenants.

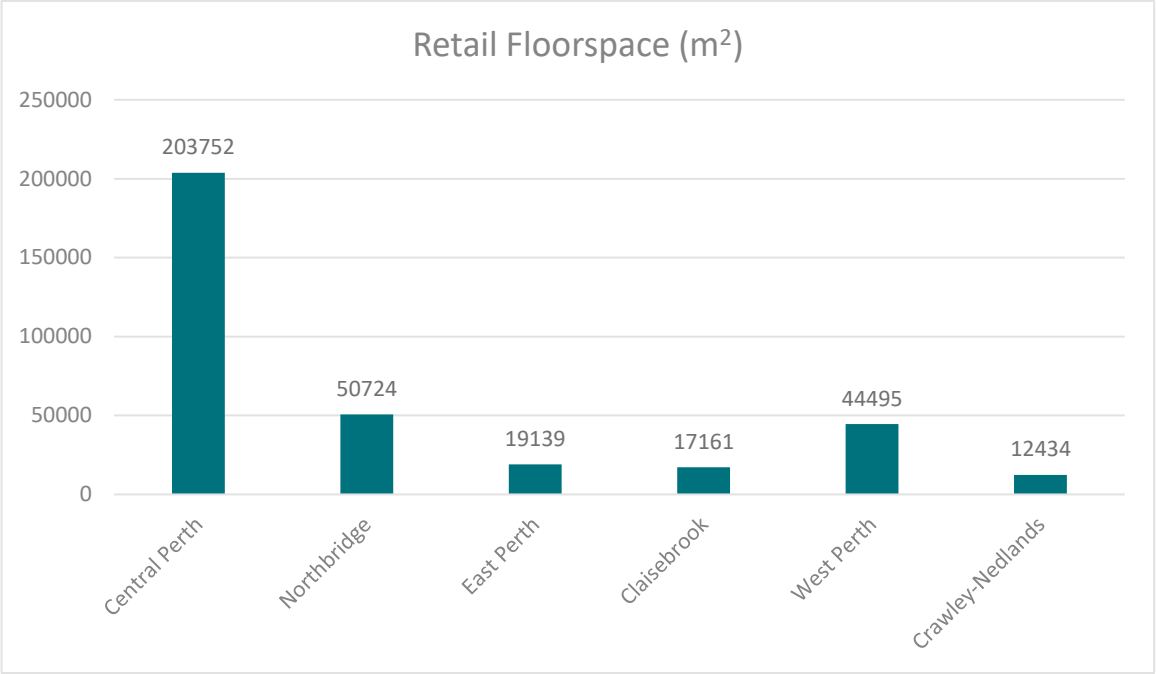
Office decentralisation

Over the years, Perth city's office market has become increasingly decentralised. Despite supplying 45% of Greater Perth's office floorspace, Perth city has a lower share of regional office stock in comparison to other Australian cities such as Sydney (61%), Melbourne (60%) and Brisbane (56%) (Colliers International, 2019). This is partly because of a shortage of office stock within the city over the last decade, as well as State Government initiatives that have encouraged office development within metropolitan centres such as Joondalup and Fremantle (Colliers International, 2019). Despite the recent challenges within the Perth city office market, large-scale decentralisation of office activity in Perth city is unlikely – due to the city's high level of accessibility, increasingly competitive rent, amenities, and proximity to key international firms and service providers.

Retail floorspace

As at 2018, Perth city accommodated 353,086 sqm of retail floorspace. Over half of this total was located in Central Perth, 14% in Northbridge and 12.6% in West Perth.

Figure 23 - Existing retail floorspace by neighbourhood



A 2018 study investigated retail activity across Perth city (Y Research, 2018). To understand retail trends, the analysis broke down retail markets in to three sub-regions:

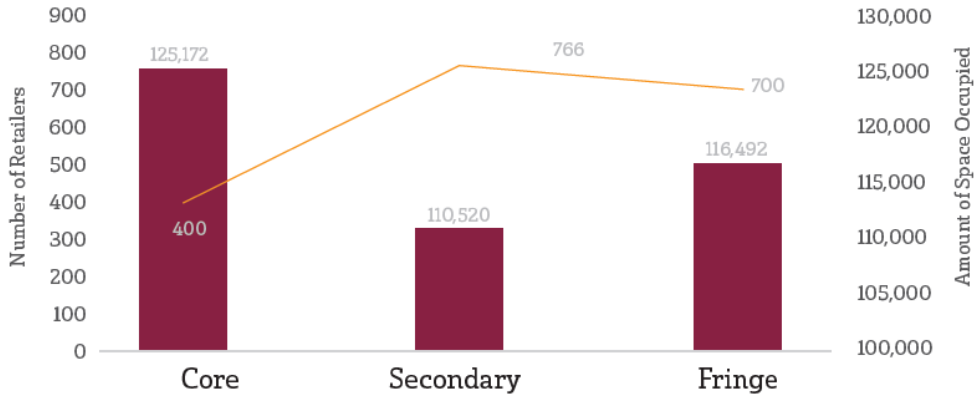
- The core sub-region. The core sub-region covers the Hay and Murray Street malls and includes all retailers within the area between William and Barrack Streets and Wellington Street and St Georges Terrace;
- The secondary sub-region covers the area of the Perth city from William Street west to Milligan Street, south of St Georges Terrace to the Swan River, east of Barrack Street to Victoria Avenue and north of Wellington Street to Aberdeen Street in Northbridge; and
- The fringe sub-region covers the rest of the city, including all of Crawley, East Perth, Nedlands and West Perth.

There are 400 retailers are located in the core sub-region (within the Central Perth neighbourhood). These retailers occupied approximately 125,172 sqm, or 35.5%, of occupied retail space within the Perth city (refer to **Figure 24**). Major properties located in the core sub region include the Hay and Murray Street Malls, Carillion City, Forrest Chase, ENEX 100 and the Piccadilly, Plaza and Trinity Arcades.

The secondary sub-region was the smallest market, despite having the highest number of retailers – at 766. These retailers occupied approximately 110,520 sqm (31.4%) of occupied space. Major properties located in the secondary sub-region include Wesley Quarter, King Street, Equus, The State Building, Brookfield Place, James Street Northbridge, Allendale Square, Elizabeth Quay and Chinatown in Northbridge (refer to **Figure 24**).

The fringe sub-region is the second largest market, with 700 retailers equating to approximately 116,492 sqm (33%) of occupied space. This region includes retail centres that, essentially, operate as 'out-of-town' suburbs centres – such as Watertown, City West, Royal Street in East Perth and Broadway Shopping Centre.

Figure 24 – Count of retailers and floorspace by sub-region (Y Research, 2018)



In total, 756 (40.5%) of retailers operate from a shopping complex within the city – with 59.5% of retailers operating from main street properties.

Of the 1,866 retailers operating within Perth city, 62.1% (1,160) of retailers are independent retailers with one or two stores, largely operating only in the city. The remaining 37.9% of retailers are part of a chain of stores.

The retail-uses shown in **Figure 25** are the 15 most common currently operating within the city (by ANZSIC code):

Figure 25 - Count of Retailers by ANZSIC Code

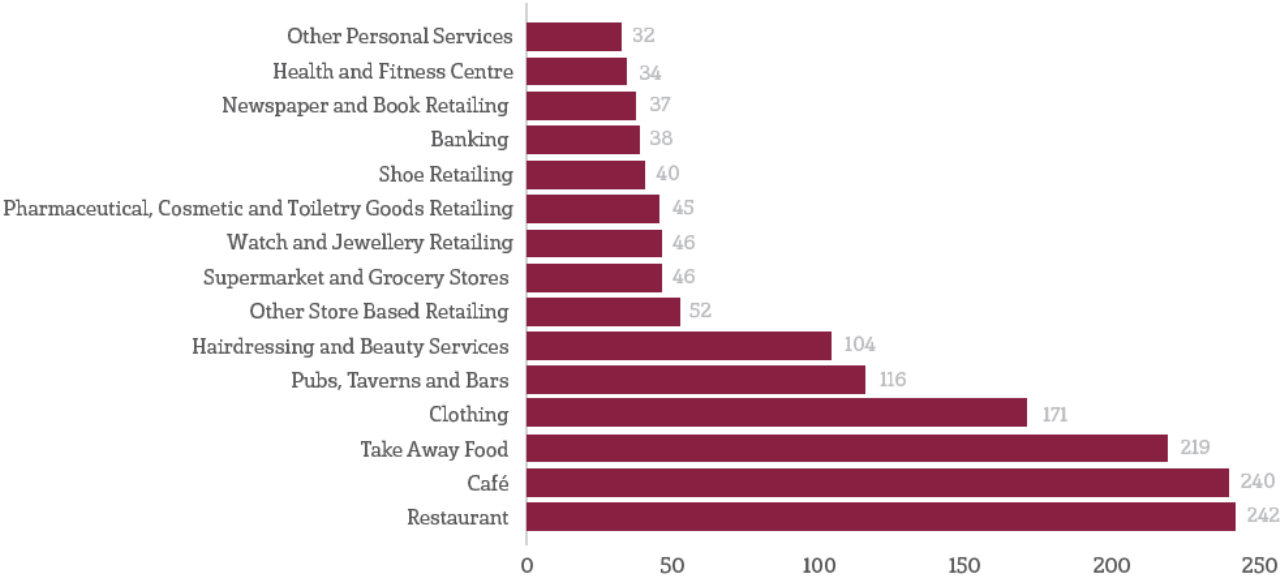
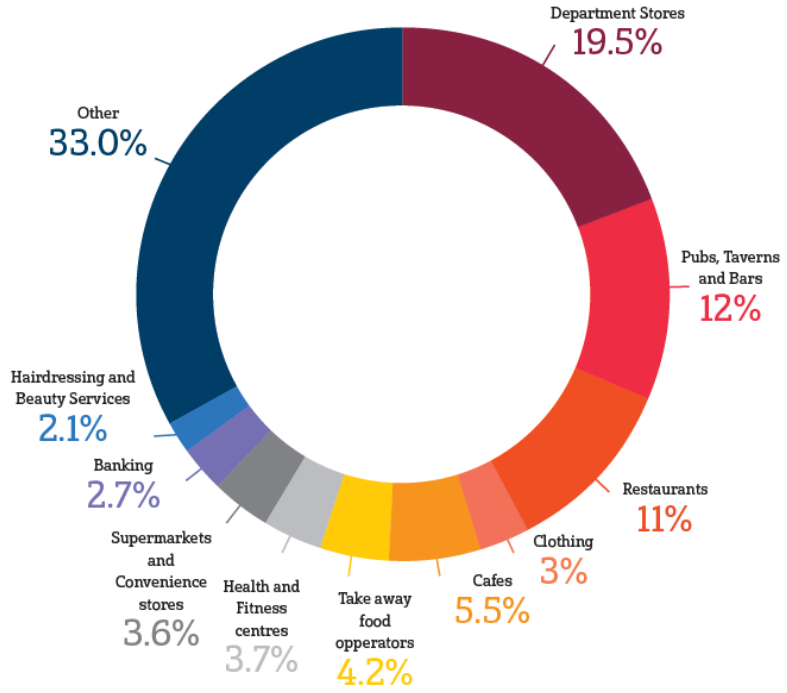


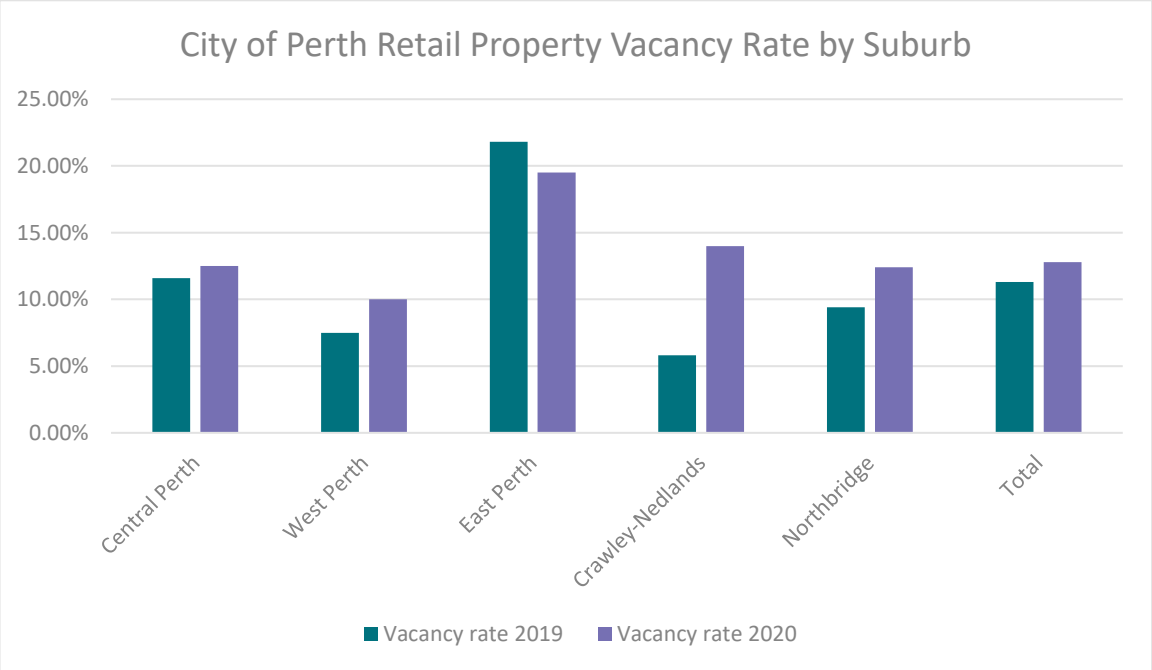
Figure 26 highlights the retail-uses currently occupying the highest amount of retail space across the Perth city.

Figure 26 - Retailers by retail floorspace (Y Research, 2018)



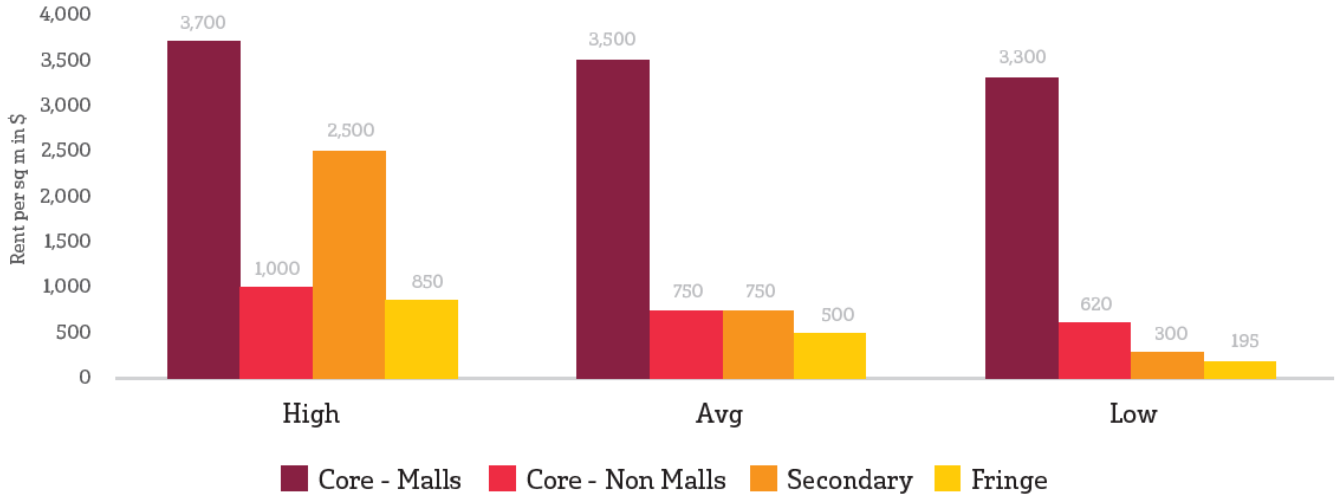
The retail vacancy rate across the city stood at 12.8% in February 2020, up from 11.3% in February 2019 (refer to **Figure 27).**

Figure 27 – Retail vacancy rates by neighbourhood (REMPLAN, 2020)



Across the Perth city retail markets there is a wide variety of market rents. Most tenants are paying around $3,500 per sqm in the CBD (within Central Perth neighbourhood). This is double the rent for specialty retailers in Perth's major regional and sub-regional centres, who pay between $1,100–$2,000 per sqm. Rents in the CBD outside of the malls and Barrack and William Streets are nearly 75% cheaper than the main malls (refer to **Figure 28**).

Figure 28 - Retail rents by property type per annum (Y Research, 2018)



Entertainment, recreation and cultural floorspace

The distribution and nature of entertainment and recreation uses varies across Perth city neighbourhoods. However, the presence of daytime and evening destinations is evident across all neighbourhoods, contributing to the vibrancy of Perth city as the major entertainment destination within the Greater Perth region. There was over 360,000sqm of entertainment, recreation and cultural floorspace across Perth city as at 2015 (Colliers International, 2019). The breakdown of this floorspace is shown in **Table 27** and on **Figure 29**).

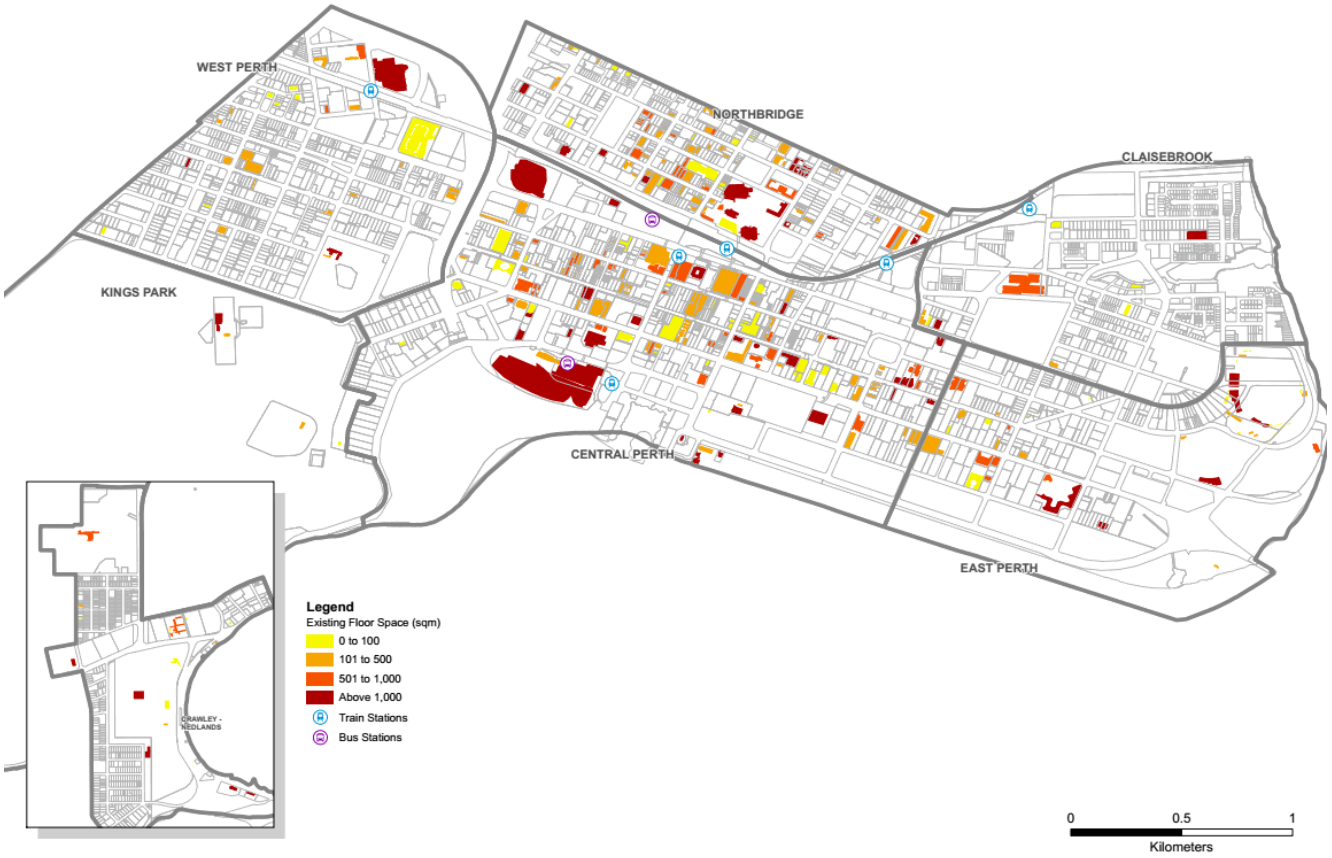
Table 27 – Existing entertainment, recreation and cultural floorspace by neighbourhood (Colliers International, 2019)

Neighbourhood	Entertainment/recreation/ cultural floorspace (m²)	Proportion of Total
Central Perth	193,602	53.5%
Northbridge	104,439	28.8%
East Perth	13,419	3.7%
Claisebrook	4,872	1.3%
West Perth	12,580	3.5%
Crawley-Nedlands	16,288	4.5%
Total	362,190	100%

Unsurprisingly, Central Perth and Northbridge account for the largest amount of floorspace (over 80%). According to Tourism WA's: Perth Entertainment Precincts' report, Central Perth is the most visited area across the Greater Perth region, closely followed by Fremantle and Northbridge. Central Perth's key attractors included its retail and food and beverage mix, with 53% of respondents having visited the city to shop or eat (Tourism WA, 2017). The distribution of entertainment and hospitality is fairly evenly distributed throughout Central Perth and Northbridge, with higher concentrations in the west of Central Perth and concentrations of activity along St Georges Terrace and Hay Street.

Generally, the concentration of entertainment and hospitality relates to the density of employment and housing. For this reason, there are fewer entertainment, recreation and hospitality destinations in West Perth, Crawley-Nedlands and Claisebrook, and they tend to be clustered along main streets within the neighbourhood centres (and largely service the local worker and resident population).

Figure 29 - Entertainment, recreational, cultural floorspace distribution in Perth city (Colliers International, 2019)



Health, education and community service floorspace

Due to its central location, Perth city has always been home to a range of medical, research, education and community service establishments.These services are an important component of the community infrastructure of a city, and support its resident and worker population. As the city's resident population increases, local services and activities become increasingly important.

Crawley-Nedlands has significant areas dedicated to health, education and research – including Queen Elizabeth II Medical Centre (QEII) and UWA. These institutions form part of a 'specialised centre' – as defined by State Planning Policy 4.2 Activity Centres – and significantly affect the land-use characteristic of the neighbourhood.

QEIIMC is the major employment centre within Nedlands – with its 28-hectare medical centre (which includes Sir Charles Gairdner Hospital) employing over 5,500 staff and treating over 420,000 patients a year (North Metropolitan Health Service, 2021). According to the City Centres Analysis, QEII brings around 25,000 students, workers and visitors to Crawley-Nedlands each day.

Similarly, Crawley's land-use diversity is dominated by a single major land use because of UWA. The university employs, on average, 4,700 academic and administrative staff and has around 26,000 enrolled students each year. Additionally, the recent City Deal will see the additional campuses situated within the city including:

- A new Edith Cowan University Cultural and Creative Industries Education CBD Campus which will bring together programs in technology, industry and creativity, including the WA Academy of Performing Arts, the school of Business and Law and an advanced technology and cyber security centre;
- The Murdoch University's Vertical Inner-City Campus focusing on digital innovation in delivering business, law and information technology disciplines, including an industry partnership with CISCO and an e-sports academy; and
- Investment in the Curtin University's Historical Heart Cluster, including the expansion of the Graduate

School of Business and Law School and the creation of a healthcare and clinical training facility.

Royal Perth Hospital precinct is a major health precinct located in the north-east corner of Central Perth which includes a 450-bed hospital and the major trauma centre of Western Australia. Central Perth also accommodates Mount Hospital which is a 224 bed private facility located on Mounts Bay Road to the west of Mitchel Freeway.

It is estimated that there will be a demand for an additional 67,000sqm of floor space for health and research land uses across Perth city by 2038 (Colliers International, 2019). The majority of this floorspace would be required in Central Perth, East Perth and Northbridge,

The breakdown of health, education and community service floorspace by neighbourhood, as at 2015, is outlined in **Table 28**.

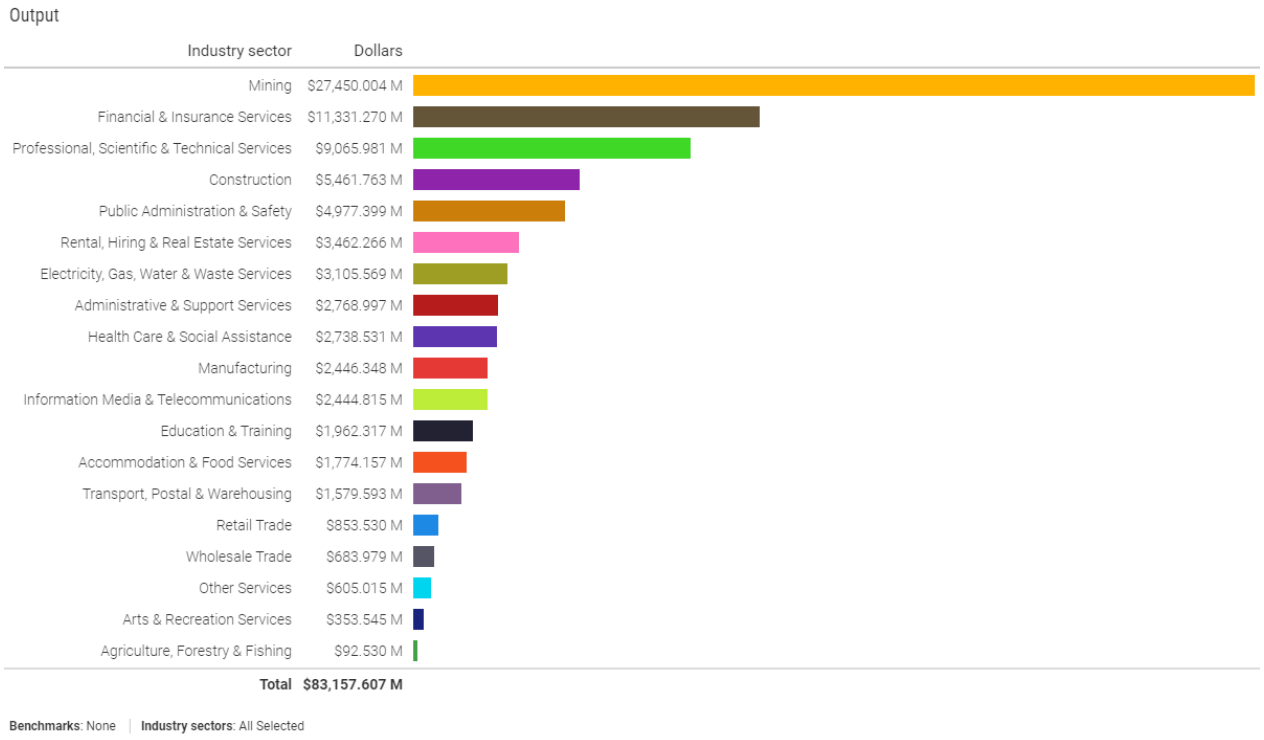
Table 28 - Health, education and community service floorspace by neighbourhood

Neighbourhood	Entertainment/recreation/ cultural floorspace (m^2)	Proportion of Total
Central Perth	193,602	53.5%
Northbridge	104,439	28.8%
East Perth	13,419	3.7%
Claisebrook	4,872	1.3%
West Perth	12,580	3.5%
Crawley-Nedlands	16,288	4.5%
Total	362,190	100%

1.3.1.4. Economic diversity

The mining, financial and professional services sectors have sustained high wages and employment growth over the past two decades. However, overall, Perth city has relatively low economic diversity. It is ranked in the 52nd percentile of Australian local governments for economic diversification, which is lower than Adelaide (32nd percentile), Darwin (39th percentile), Melbourne (43rd percentile) and Sydney (46th percentile) (Hatchman and Regional Australia Institute, 2016) The path to diversity takes time, and will require consistent and ongoing effort in this area. **Figure 30** highlights prominent industry sectors in Perth city.

Figure 30 - Perth city industry output (June 2019) (Australian Bureau of Statistics, 2019 and REMPLAN, 2020)



As the WA economy transitions away from its reliance on the resources sector, several industries have begun to emerge as major Perth city office occupiers. Recently, improved affordability has seen an increase in the amount of city office space occupied by education, technology, shared work spaces and medical companies. In 2012, these sectors occupied 4.6% of city office space, and in early 2017, this increased to 7.3% (Pracsys, 2017).

In 2017, the City undertook an Economic Future Scenario Analysis to instigate likely trends industry sectors and job creation. The study recommended that growth of the following sectors should be prioritised:

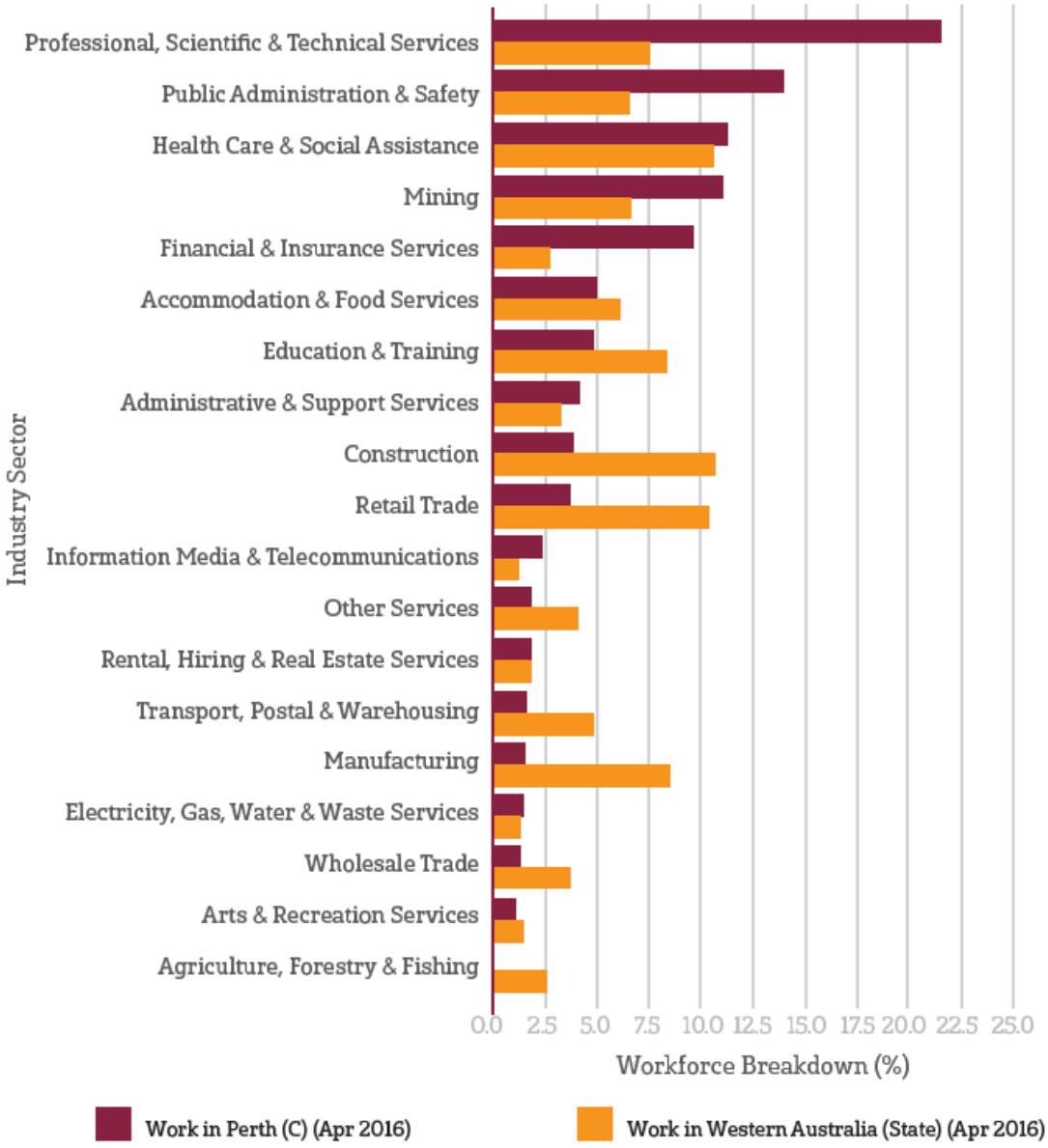
- Tourism and Food and Beverage;
- Education (international);
- Medical Health and Life Sciences primarily around UWA-QEII specialist activity centre and Royal Perth Hospital; and
- Community Services.

Economic diversity will continue to be important as the city grows. A diverse economy will ensure the city remains resilient – not relying on one industry alone but leveraging from a mix of industries, human capital and competitive advantage (Pracsys, 2017).

1.3.1.5. Employment

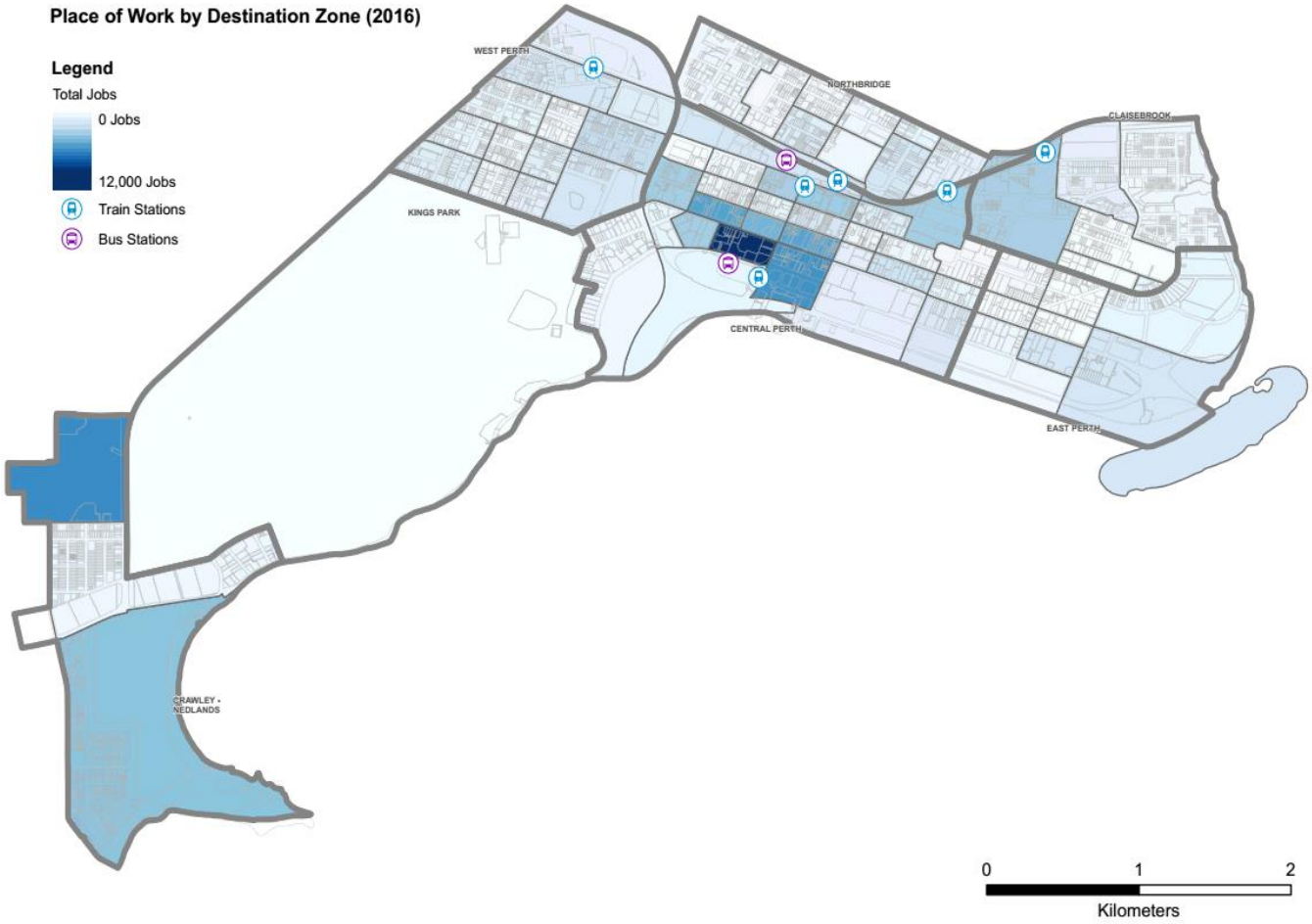
According to data from REMPLAN, it's estimated that there were approximately 150,000 jobs in Perth city in 2016. Professional, scientific and technical services dominate the employment market, with a 21.4% share of jobs in the local economy. Public administration, health and mining sectors each contribute to more than 10% of the Perth city workforce. These reflect the presence of major educational and health facilities as well as professional, mining and government offices (refer to **Figure 31**).

Figure 31 - Perth city workforce breakdown (REMPLAN, 2016)



The greatest employment intensity in Perth city is within Central Perth (56%) and, more specifically, the CBD (refer to **Figure 32**). West Perth is the neighbourhood with the second largest number of employees, of which 40% are employed in the professional services sector.

Figure 32 - Place of work by neighbourhood



A large proportion of Perth city workers live in other parts of Greater Perth, and commute in to the city daily. This demonstrates the level of importance businesses place on being located in Perth city, as well as their need for Perth city to remain highly accessible to workers.

The three dominant occupations within the city are professionals, clerical/administration workers and managers (refer to **Table 29**). These three professions account for almost 75% of the 150,000 workers within the city – and also make up 60% of the jobs held by Perth city residents. Comparatively, these three professions combine to total less than 50% of jobs available in the Greater Perth area.

Table 29 - Perth city workforce occupations (Australian Bureau of Statistics, 2016)

	Work and live in Perth city		Work in Perth city and live elsewhere	
Occupation	Jobs	%	Jobs	%
Managers	931	16.0	21,164	14.7
Professionals	2,395	41.2	55,326	38.5
Technicians and Trades Workers	394	6.8	11,242	7.8
Community and Personal Service Workers	637	11.0	9,396	6.5
Clerical and Administrative Workers	778	13.4	30,489	21.2
Sales Workers	276	4.7	6,425	4.5

Machinery Operators and Drivers	25	0.4	2,292	1.6
Labourers	336	5.8	5,745	4.0
Not stated or inadequately described	37	0.6	1,588	1.1

Of all Perth city residents over the age of 15, a total of 5,791 (23.2%) also work within the city (Australian Bureau of Statistics, 2016). This accounts for 3.9% of the entire Perth city workforce, reinforcing that a significant amount of the workforce travel from other local government areas, as demonstrated in **Table 29.**

Employment trends

As at March 2018, the unemployment rate among Perth city residents was 4.6%, which is lower than the WA average (6.9%) but higher than the City of Sydney (3.9%) and inner-Melbourne (3.9%) (REMPLAN, 2018).

The availability of a highly skilled and educated workforce enables organisations to respond to changing environments, address challenges and pursue commercial opportunities. Conversely, a lack of access to appropriate human capital can constrain the growth of local enterprises and discourage new business creation. The availability of high-quality workforce, combined with economic cycles, impacts employment and business sector trends.

While the number of workers in Perth city represents the largest cluster of employment in WA, Perth city's employment levels and density of jobs is lower than the City of Sydney and Inner Brisbane, but greater than the Cities of Melbourne and Adelaide (Colliers International, 2019). Improving the appeal of Perth city to existing and prospective workers – in combination with the provision of more housing options and greater amenity – will encourage more people to both live and work within Perth city.

1.3.1.6. City vibrancy and performance

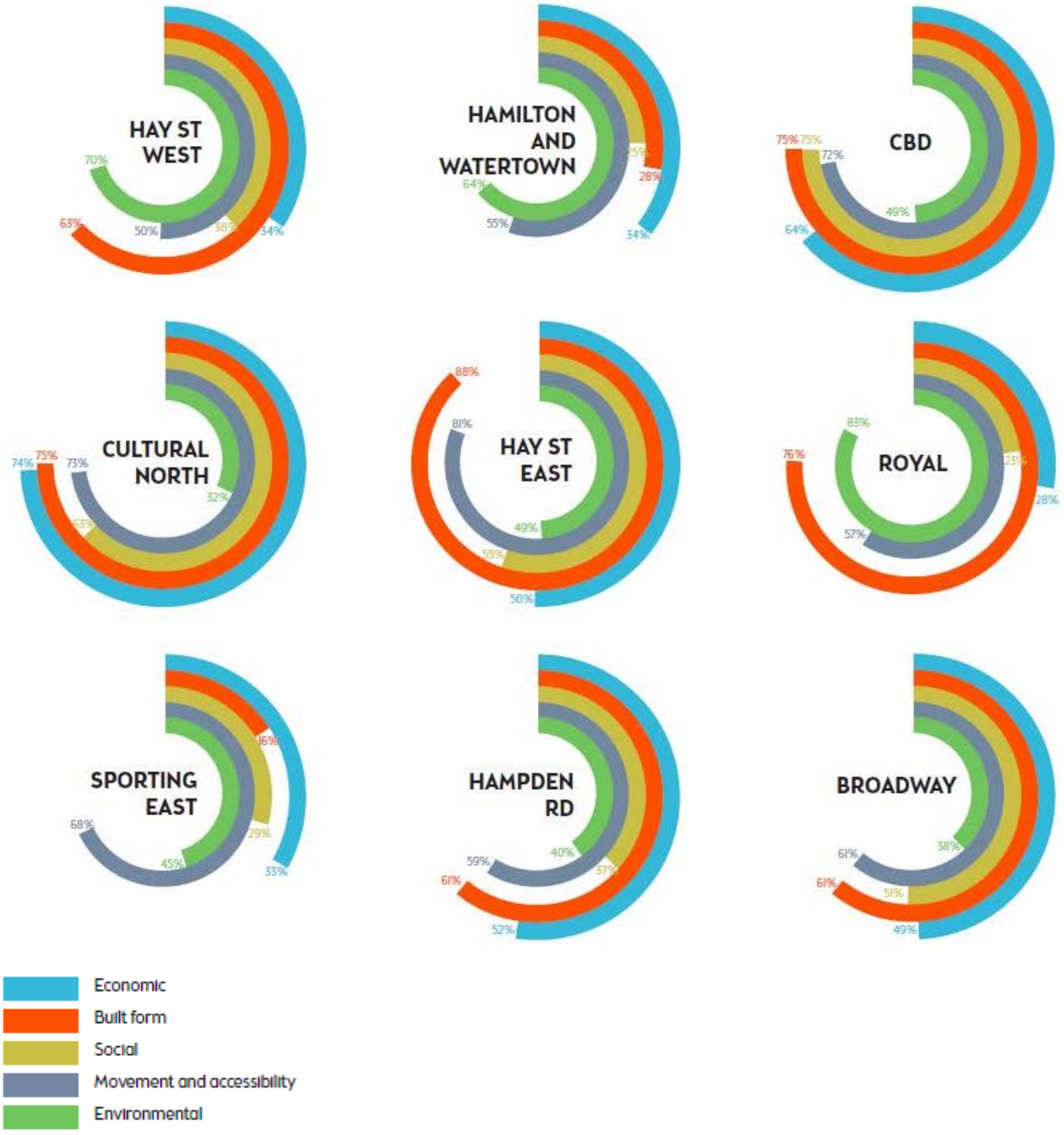
Activity centres

Although the majority of Perth city is identified as the 'Perth Capital City' activity centre under State Planning Policy 4.2, several smaller centres have emerged within the city which generally service their surrounding neighbourhood context. The City has examined the existing performance and future roles of these centres through two key studies – Perth City Centres Analysis (Intermethod, 2018) and Neighbourhood Activity Centres Analysis (Pracsys, 2020).

Perth City Centres Analysis

The Perth City Centres Analysis (2018) assessed the strengths and weaknesses of nine existing and emerging centres to measure performance across the following themes - economic, built form, social, movement and accessibility and environmental. These performance indicators for each neighbourhood are illustrated in **Figure 33**.

Figure 33 - Perth City Centres evaluation framework for activity centres



ECONOMIC SCORE CARD

	Daytime pedestrian footfall	Evening pedestrian footfall	Business diversity	Place vibrancy - day time	Place vibrancy - evening	Night time economy	Vacancies at ground floor level	Event visitor numbers	Total theme score
Hay St West	3.4	0.1	3.4	1.2	0.3	0.5	1.7	0.5	34%
Hamilton and Watertown	0.5	0	3.5	0.5	0	0.1	4.3	1.5	35%
CBD	4.6	4.4	4.4	3.1	1.8	1.0	2.8	5	64%
Cultural North	1.4	3.2	3.9	2.7	3.6	5	3.3	4	74%
Hay St East	1.7	2.7	3.6	2.5	3.8	1.5	1.5	2	50%
Royal	0.8	1.3	4.1	2	0.3	0.4	0	0	28%
Sporting East	0	0	3	0.2	0	0.3	4.5	5	33%
Hampden Rd	0.6	0.3	2.6	2.7	2.1	3.4	3.6	0	52%
Broadway	0.9	0	3.1	1.4	0.3	2.8	4.5	0.5	49%

BUILT FORM SCORE CARD

	Active frontages	Urban design quality	Total theme score
Hay St West	2.7	3.6	63%
Hamilton and Watertown	0.7	2.1	28%
CBD	4	3.5	75%
Cultural North	3.7	3.8	75%
Hay St East	5	3.8	88%
Royal	3.7	3.9	76%
Sporting East	0	1.6	16%
Hampden Rd	2.7	3.4	61%
Broadway	3.7	2.4	61%

SOCIAL SCORE CARD

	Population density	Live local services	Family friendly facilities	Total theme score
Hay St West	1.7	1.3	2.7	38%
Hamilton and Watertown	0	1	2.7	25%
CBD	3.4	5	2.8	75%
Cultural North	1.9	5	1.5	56%
Hay St East	5	2.3	1	55%
Royal	1.4	1	1	23%
Sporting East	0.4	2	2	29%
Hampden Rd	1	2	2.5	37%
Broadway	2	3.6	2	51%

ENVIRONMENTAL SCORE CARD

	Tree ratio	Green space accessibility	Total theme score
Hay St West	2.1	4.9	70%
Hamilton and Watertown	3.5	2.9	64%
CBD	1.9	3	49%
Cultural North	1.4	1.8	32%
Hay St East	2.3	2.6	49%
Royal	5.0	3.3	83%
Sporting East	1	3.5	45%
Hampden Rd	0.9	3.1	40%
Broadway	1.7	2.1	38%

MOVEMENT AND ACCESSIBILITY SCORE CARD

	Public transport outreach	Connectivity	Ease of cycling	Total theme score
Hay St West	2.1	2	3.5	50%
Hamilton and Watertown	4.3	1.5	2.5	55%
CBD	4.3	3.5	3	72%
Cultural North	5	3	3	73%
Hay St East	4.1	5	3	81%
Royal	1.4	3.5	4	59%
Sporting East	3.7	3.5	3	68%
Hampden Rd	3.4	3.5	2	59%
Broadway	2.7	4	2.5	61%

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The analysis confirms that while some centres had clear strengths, particularly against built form and environmental indicators, they lacked optimal activation and generally scored poorly across economic and social indicators. The study highlights key issues and strategic directions for each neighbourhood centre which are summarised in **Table 30**.

Table 30 - Perth City Centres Analysis summary

Area of Activity	Key Issues	Key Strategic Directions
Hay St West	• Lack of cohesion and design quality. • Limited land use mix and night time economy - increases the centre's vulnerability to economic downturns. • A lack of family orientated facilities impacts negatively upon an otherwise appealing location.	• Retain and promote fine-grain building typologies, and encourage increased land use diversity. • Improve connections to the CBD, Parliament and Kings Park. • Encourage family supportive facilities to increase residential appeal. • Consider interim uses to activate commercial vacancies.
Hamilton and Watertown	• Physically severed from the CBD and Northbridge. • Street environment is unattractive for pedestrians and cyclists. • Limited land use mix and night time economy.	• Maintain bulky-goods function until a comprehensive redevelopment is viable. • Redevelopment should improve pedestrian and cycling connection, particularly to City West station. • Consider interim uses to activate commercial vacancies.

Area of Activity	Key Issues	Key Strategic Directions
CBD	• Excessive vehicle traffic adversely impacts pedestrians and cycling connectivity. • Activity cycles according to business hours. • Large floorplate developments limit fine grain activity.	• Emphasise strategic Capital City role while increasing the residential population and night time economy. • Encourage interim uses to activate vacant ground floor tenancies. • Encourage adaptive reuse of historic building stock. • Improve north-south pedestrian links and street activation, particularly between City Link and Elizabeth Quay. • Activate the ground plane of large floorplate buildings. • Promote cycling.
Northbridge Cultural	• Perception of poor safety especially at night. • Limited urban green space and children's playgrounds. • Limited daytime activation. • Heavily trafficked roads adversely impact pedestrians and are poorly activated.	• Maintain strong cultural and entertainment functions and minimise land use conflict with new residents. • Retain and promote a diverse fine grain business ecosystem; particularly the historic strip shops. • Promote cycling and connectivity to Perth station. • Introduce urban greenery to increase shading and improve amenity.
Hay Street East	• Limited community amenity such as supermarkets and medical services. • Disruptive one-way Hay St traffic. • Underutilised historic heritage structures.	• Celebrating the historic buildings through adaptive reuse. • Encourage community amenity to support a growing population. • Make Hay St two-way or narrow the lanes further. • Improve access to McIver station.
Royal St	• Limited intensity and evening economy. • Breadth of catchment is limited due to severance (railway, freeway and river). • Lack of community facilities despite residential population. • Poor connection to Claisebrook Cove and Claisebrook Station.	• Encourage community infrastructure to support the residential population. • Encourage the redevelopment of the large Government owned properties. • Improve legibility and wayfinding. • Expand role of Perth City Farm.
Sporting East	• Limited land use diversity. Lacks activity outside of major events. • Large underdeveloped land parcels have great redevelopment potential. • Relatively poor public transport connectivity, particularly north-south. • Uncertain redevelopment timeframe for Waterbank.	• Redevelopment should capitalise upon the clustering of sporting activities and proximity to river. • Use large land parcels for community infrastructure e.g. public schools. • Enhance public transport to reduce reliance on surface car parking. • Further increase urban greenery.
Hampden Rd	• Narrow footpaths cause crowding • Poor connectivity to the QEII precinct.	• Partner with the City of Nedlands, local businesses and QEII hospital to develop a joint vision for the strip.

Area of Activity	Key Issues	Key Strategic Directions
	• Lack of coordinated urban design and low street tree cover. • Shared management with City of Nedlands.	• Improve pedestrian and cycling connectivity to the medical precinct through Broadway and beyond to the PSP along the Swan River.
Broadway	• Low land use diversity and intensity. • Minimal active street frontages with most businesses concentrated in the Broadway Fair shopping centre. • Numerous strata developments limit redevelopment opportunities. • Shared management with City of Nedlands.	• Partner with City of Nedlands, local businesses and the UWA to develop a clear, joint vision for the strip. • Improve pedestrian and cycling connectivity to the Swan River through Hampden Rd to the medical precinct.

Neighbourhood Activity Centres Analysis

The Neighbourhood Activity Centres Analysis 2020 examined the performance of the city's six neighbourhood activity centres and provided recommendations for how these centres could support the economic development, population growth, retail viability and enhanced liveability. The study identified floorspace gaps (current and future) for priority land uses and identified the key issues impacting the performance of each centre. These findings are summarised in **Figure 31**.

Table 31 - Neighbourhood Activity Centres Analysis 2020 - Summary

<table>
<tr><th>Neighbourhood Activity Centre</th><th>Key Issues</th></tr>
<tr><td>Central Perth Retail Core</td><td>• Access is a strength, as it is the public transport core for Greater Perth. Most origin points are well located around the retail core. However, the eastern end of the core is less connected to the primary origins (EQ and Perth Station).
• Missed activation opportunities at key exposure points. These should be occupied by high-turnover retail or food and beverage.
• Dilution of activity due to excessive passages between Hay and Murray St malls.
• Under-activated at night and on weekends – low sense of safety.
• Numerous anchors but limited activation and wayfinding between them.
• Benchmarked land use gaps:
<table>
<tr><td>Land Use</td><td>Supermarket</td><td>Specialty retail</td><td>Office</td><td>Health-Education</td><td>Entertainment</td></tr>
<tr><td>Benchmark Gap (sqm)</td><td>0</td><td>1,063</td><td>2,658</td><td>530</td><td>1,696</td></tr>
</table></td></tr>
<tr><td>Hay Street West Perth</td><td>• Limited access from the outside of the city and movement on Hay St is restricted due to one-way traffic.
• Limited connectivity between the centre and key origin points or visitor anchors (City West train station, Parliament House, Kings Park).
• Most workers drive to West Perth, limiting pedestrian traffic.
• Nighttime activity is limited and dispersed.
• No clear anchor within the centre.
• Critical mass of residents and workers are not in close proximity to the centre.
<table>
<tr><td>Land Use</td><td>Supermarket</td><td>Specialty retail</td><td>Office</td><td>Health-Education</td><td>Entertainment</td></tr>
<tr><td>Benchmark Gap (sqm)</td><td>863</td><td>355</td><td>655</td><td>212</td><td>1,740</td></tr>
</table></td></tr>
</table>

<table>
<tr><th>Neighbourhood Activity Centre</th><th>Key Issues</th></tr>
<tr><td>Hay Street East Perth</td><td>

There is limited public transport access to the neighbourhood centre and movement on Hay Street is limited due to one-way traffic.
Limited connectivity between the centre and key origin points or visitor anchors (CBD core, WACA, Gloucester Park, Optus Stadium).
Dominance of vehicle traffic limits pedestrian activity.
Lack of continuous active frontages and key corner sites are poorly activated.
No clear anchor within the centre.
Limited links to surrounding public open spaces.
Benchmarked land use gaps:

<table>
<tr><td>Land Use</td><td>Supermarket</td><td>Specialty retail</td><td>Office</td><td>Health-Education</td><td>Entertainment</td></tr>
<tr><td>Benchmark Gap (sqm)</td><td>1,216</td><td>2,097</td><td>1,387</td><td>1,803</td><td>2,169</td></tr>
</table>
</td></tr>
<tr><td>Northbridge</td><td>

No defined neighbourhood centre.
Somewhat separated from public transport connections but close to Perth and McIver station.
Lack of activation between Stirling Street area and entertainment precinct.
No clear anchor.
Limited public open spaces in Northbridge-east.
Benchmarked land use gaps:

<table>
<tr><td>Land Use</td><td>Supermarket</td><td>Specialty retail</td><td>Office</td><td>Health-Education</td><td>Entertainment</td></tr>
<tr><td>Benchmark Gap (sqm)</td><td>0</td><td>352</td><td>949</td><td>293</td><td>614</td></tr>
</table>
</td></tr>
<tr><td>Royal Street Claisebrook</td><td>

Limited public transport access, with most users accessing the Neighbourhood via the Central Perth.
Limited connectivity with surrounding train stations, river foreshore and Optus Stadium.
Parking for workers is separated from the centre which limits pedestrian activity.
Limited activation of the intersection of Plain St and Royal St.
Claisebrook Cove is an anchor, creating good activation for operators facing the water. However, there remains limited connection to the Royal St area.
The main employment anchors are State government employment and the TAFE campus, both of which are not well linked to the Royal St Centre.
Benchmarked land use gaps:

<table>
<tr><td>Land Use</td><td>Supermarket</td><td>Specialty retail</td><td>Office</td><td>Health-Education</td><td>Entertainment</td></tr>
<tr><td>Benchmark Gap (sqm)</td><td>618</td><td>1,262</td><td>496</td><td>840</td><td>2,069</td></tr>
</table>
</td></tr>
<tr><td>Crawley-Nedlands (Broadway and Hampden Rd)</td><td>

There is limited public transport servicing the Broadway neighbourhood centre.
Traffic between UWA and Broadway is diluted due to multiple access options. These routes are poorly activated.
Limited wayfinding between Hampden Rd centre and surrounding anchors.
Hampden Rd centre has no clear anchor.
Benchmarked land use gaps:

<table>
<tr><td>Land Use</td><td>Supermarket</td><td>Specialty retail</td><td>Office</td><td>Health-Education</td><td>Entertainment</td></tr>
</table>
</td></tr>
</table>

Neighbourhood Activity Centre	Key Issues					
	Benchmark Gap (sqm)	549	1,612	1,703	751	2,849

Overall, the study found that many of the city's activity centres do not attract sufficient pedestrian traffic to achieve optimal activation. This is generally due to low population concentrates, a dilution of active frontages, a lack of key anchors and land use gaps. Cyclical activation was also identified as an issue with many centres lacking activation at night and on weekends, while other areas such as Northbridge achieved low daytime activation.

The study suggests a range of planning and non-planning actions to improved activity centre performance. Key recommended actions for the city as a whole include:

- Support accelerated population growth to 90,000 by 2050.
- Establishing a coordinated vision over each neighbourhood centre.
- Change of use exemptions and development incentives for key land use gaps.
- Improved connectivity and wayfinding.
- Public realm projects to support desired activation in key areas.
- Free alfresco dining in key areas.
- Regular data monitoring to respond to changes in activity.

Movement and Place

In 2017 the City engaged Intermethod undertake a Movement and Place Assessment of Perth city streets to evaluate their roles in terms of movement and place. The movement and place approach was conceived in 2001 in Europe and has been used in various cities in the United Kingdom, Australia, New Zealand and China. It recognises that streets perform two functions: movement of people and goods, and places which are destinations in their own right.

As a city grows, the demand for space and potential for conflict increases. An integrated approach to transport and urban planning is required to resolve any competition between the priorities of movement and place (Intermethod, 2017). The assessment assists with setting street design principles for the public realm and the interface with the private realm, and evaluating performance of the streets and network, and addressing conflicts.

The Movement and Place Assessment undertaken for the City established a baseline vibrancy pattern for Perth city, acknowledging that the vibrancy of a place is not just determined by land use, but is also influenced by pedestrian volumes, on-street activities and active building frontages.

The Assessment found that many streets are not well activated and daytime activation in most neighbourhoods drops significantly on the weekend. Central Perth (east) and West Perth experience the greatest fall in activity on the weekend –likely due to the loss of the worker population and their associated Monday-Friday activity.

Northbridge and Central Perth (west) have proven night-time economies and experience the highest levels of activation in the evenings during the week and on weekends. This is mainly driven by the food and beverage offer within these areas. Other neighbourhoods have significantly lower levels of activation at night-time, signifying the dominance of commercial and residential land uses in those areas. Overall, Northbridge and Central Perth (west) show the most consistent levels of activity, with all other neighbourhoods lagging behind.

The assessment recognises that there are many factors that impact on vibrancy including some that can be influenced by the planning framework, such as land uses, development intensity and building design. But other such as physical road and footpath conditions, speed limits, pedestrian and cycling facilities, landscaping and legislation and policies relating to outdoor dining, licensing and events. An integrated approach to creating vibrancy in city streets will be essential.

1.3.1.7. Hotels and Short Stay Accommodation supply

Recent investment in Perth city's tourism offering has focused on capacity shortfalls in hotel accommodation – with approximately 3,000 new hotel rooms delivered in the city since 2012 (when the City introduced development incentives for hotels and other forms of short-term accommodation).

However, hotel occupancy rates fell in 2016 and early 2017, with demand failing to keep pace with additional accommodation supply. The hotel industry has been impacted further by Covid – 19 with hotel occupancy down by 33% in June 2020 compared to the same period the previous year (Tourism WA. 2020).

1.3.1.8. Proposed Northbridge Special Entertainment Precinct

Northbridge plays a significant economic and cultural role with its concentration of entertainment venues as well as cultural facilities. Collectively, this blend of land uses has created the largest cultural and entertainment precinct in WA.

An economic analysis of the proposed Northbridge Special Entertainment Precinct undertaken by Lucid Economics in 2018 on behalf of Tourism WA, demonstrated that the value of tourism generated within the precinct equated to $174 million in Gross State Product and approximately 1,600 jobs (both directly and indirectly). It is estimated that in 2017 the precinct attracted approximately 916,000 visitors.

The City has been working with the State Government to ensure the protection of this important precinct through both changes to the Environmental Protection (Noise) Regulations and the City's planning scheme. The latter ensuring that new development is appropriately attenuated to mitigate noise generated from entertainment venues.

1.3.1.9. Employment Floorspace Growth

The 2019 Commercial Land Use Trends Analysis and Demand Forecast provides employment floorspace projections from 2018 – 2038. These forecasts are detailed below.

Future office demand

It is estimated that there will be demand for an additional 1.2 million sqm of office floorspace between 2018 to 2038, which represents a 51.3% increase. The breakdown by neighbourhood is shown in **Table 32**.

Table 32 - Office floorspace demand forecasts by neighbourhood (Colliers International, 2019)

Office Floorspace Demand Forecasts (m^2)						
Neighbourhood	**2018**	**2023**	**2028**	**2033**	**2038**	**20 Year addition**
Central Perth	1,443,010	1,596,962	1,785,629	1,974,336	2,182,986	739,976
Northbridge	171,692	190,010	212,458	234,911	259,736	88,044
East Perth	140,948	155,985	174,413	192,845	213,226	72,278
Claisebrook	93,973	103,999	116,286	128,575	142,163	48,190
West Perth	432,420	478,554	535,091	591,640	654,165	221,745
Crawley-Nedlands	46,216	51,147	57,190	63,233	69,916	23,700
Total	2,328,259	2,576,657	2,881,067	3,185,540	3,522,192	1,193,933

As indicated above, Central Perth remains the most desirable location for future office space. It is likely that demand will continue to occur between Elizabeth Square and Kings Square and along the CBD core of St Georges

Terrace. Due to West Perth's available car parking, this neighbourhood will continue to remain desirable to certain industries – and it is estimated that 46,000–60,000 sqm of office floorspace may be required per annum to meet the demand up until 2038.

Future retail demand

A demand-and-supply analysis for Perth city was undertaken to determine the retail outlook between 2018-2038 (refer to **Table 33**).

Table 33 - Retail floorspace demand by neighbourhood (Colliers International, 2019)

Retail additional floorspace forecasts (m^2)						
Neighbourhood	**2018**	**2023**	**2028**	**2033**	**2038**	**20-year addition**
Central Perth	203,752	230,923	259,011	285,332	313,911	110,159
Northbridge	50,724	55,320	60,333	65,800	71,763	21,039
East Perth	19,139	21,515	24,125	27,006	30,279	11,140
Claisebrook	17,161	19,786	21,556	23,203	25,100	7,939
West Perth	44,495	48,669	53,545	58,593	64,187	19,692
Crawley-Nedlands	12,434	13,086	13,851	14,627	15,469	3,035
Total	353,087	395,168	438,822	481,542	528,323	175,236

It is estimated that there will be demand for an additional 175,236sqm of retail floorspace between 2018 to 2038. The bulk of this floorspace is expected to continue in Central Perth, particularly within the malls and Forrest Place – and this will likely intensify and diversify as worker population increases. Northbridge and West Perth were identified as secondary sites for future retail development – most likely due to the prominent office, residential and entertainment land uses in these areas which support retail demand. Retail demand outside of Central Perth, Northbridge and West Perth will be largely driven by the resident population, and the desire to service their needs.

Future entertainment, recreational and cultural demand

It is estimated that there will be demand for an additional 64,500sqm of entertainment, recreational and cultural floorspace across Perth city between 2018 to 2038, which represents a 17.8% increase (Colliers International, 2019). The majority of this floorspace would be required in Central Perth and Northbridge, as these types of land uses benefit from clustering activity (to take advantage of the existing consumer base and passing trade) (Colliers International, 2019). Future population growth in city neighbourhoods is likely to impact demand across various sub-categories, such as bars and fitness venues, and planning policy should be flexible to cater to this need as it arises.

It is estimated that there will be demand for an additional 64,500sqm of entertainment, recreational and cultural floorspace across Perth city between 2018 to 2038, which represents a 17.8% increase (refer to **Table 33**). The majority of this floorspace would be required in Central Perth and Northbridge, as these types of land uses benefit from clustering activity (to take advantage of the existing consumer base and passing trade) (Colliers International, 2019). Future population growth in city neighbourhoods is likely to impact demand across various sub-categories, such as bars and fitness venues, and planning policy should be flexible to cater to this need as it arises.

Table 34 – Entertainment, recreation and cultural floorspace demand by neighbourhood Colliers International, 2019)

Retail additional floorspace forecasts (m^2)						
Neighbourhood	**2018**	**2023**	**2028**	**2033**	**2038**	**20-year addition**
Central Perth	196,233	201,951	208,186	214,986	222,402	26,169
Northbridge	104,439	106,604	111,306	116,435	122,029	128,129
East Perth	13,419	14,003	15,272	16,656	18,165	19,811
Claisebrook	5,054	5,448	5,878	6,348	6,859	1,805
West Perth	12,580	13,128	14,317	15,614	17,029	18,573
Crawley-Nedlands	16,288	16,415	16,690	16,991	17,318	17,676
Total	362,190	368,677	382,767	398,135	414,895	433,174

Future health, education and community service demand

It is estimated that there will be demand for an additional 67,094sqm of health, education and community service floorspace across Perth city between 2018 to 2038, which represents a 18.5% increase. The majority of this floorspace would be required in Central Perth, East Perth and Northbridge (refer to **Table 33**).

Table 35 – Health, education and community services floorspace demand by neighbourhood (Colliers International, 2019)

Retail additional floorspace forecasts (m^2)						
Neighbourhood	**2018**	**2023**	**2028**	**2033**	**2038**	**20-year addition**
Central Perth	330,747	334,302	338,179	342,407	347,019	16,272
Northbridge	119,435	123,854	128,674	133,930	139,663	20,228
East Perth	50,703	53,797	57,173	60,854	64,869	14,166
Claisebrook	40,633	42,044	43,582	45,260	47,089	6,456
West Perth	19,943	21,599	23,406	25,377	27,526	7,583
Crawley-Nedlands	549,387	549,909	550,478	551,099	551,776	2,389
Total	1,110,848	1,125,505	1,141,492	1,158,927	1,177,942	67,094

Total employment floorspace demand

It is estimated that there will be demand for an additional 1.5 million sqm of employment floorspace between 2018 to 2038. The breakdown by neighbourhood is shown in (refer **Table 36**). Colliers International anticipates that approximately 80% of this space will be required for office use.

Table 36 - Total employment floorspace demand to 2038 (Colliers International, 2019)

Neighbourhood	*Existing floorspace 2018 (m^2)*	*Additional demand to 2038 (m^2)*
Central Perth	2,173,742	931,521
Claisebrook	156,821	66,926
Crawley-Nedlands	624,452	31,632
East Perth	224,793	107,196
Northbridge	448,455	155,470
West Perth	509,986	266,137
TOTAL	4,138,249	1,558,882

Note: 'Commercial floorspace' refers to all non-residential land uses as surveyed under the Commercial Land Use Trends Analysis and Demand Forecast, 2019

The total additional employment floorspace required to 2038 is shown in **Table 37**. Taking into account the amount of space estimated as vacant or under construction, the total amount of new employment floorspace space required is approximately 994,636sqm.

Table 37 – Additional commercial floorspace required to 2038 (Colliers International, 2019)

Neighbourhood	Additional demand to 2038 (m^2)	Vacant / under construction (m^2)	Remaining floorspace required to 2038 (m^2)
Central Perth	931,521	396,484	535,037
Claisebrook	66,926	23,016	43,910
Crawley-Nedlands	31,632	11,319	20,313
East Perth	107,196	18,302	88,894
Northbridge	155,470	42,051	113,419
West Perth	266,137	73,074	193,063
TOTAL	1,558,882	564,246	994,636

1.3.1.10. Employment growth

As part of the Commercial Land Use Trends Analysis and Demand Forecast, Colliers international calculated estimated employment growth per neighbourhood to 2038 (refer **Table 38**). Almost 70,000 additional workers are anticipated in Perth city by 2038. The majority of these workers will be located in Central Perth, which is unsurprising given the distribution of anticipated employment floorspace growth (refer **Table 36**).

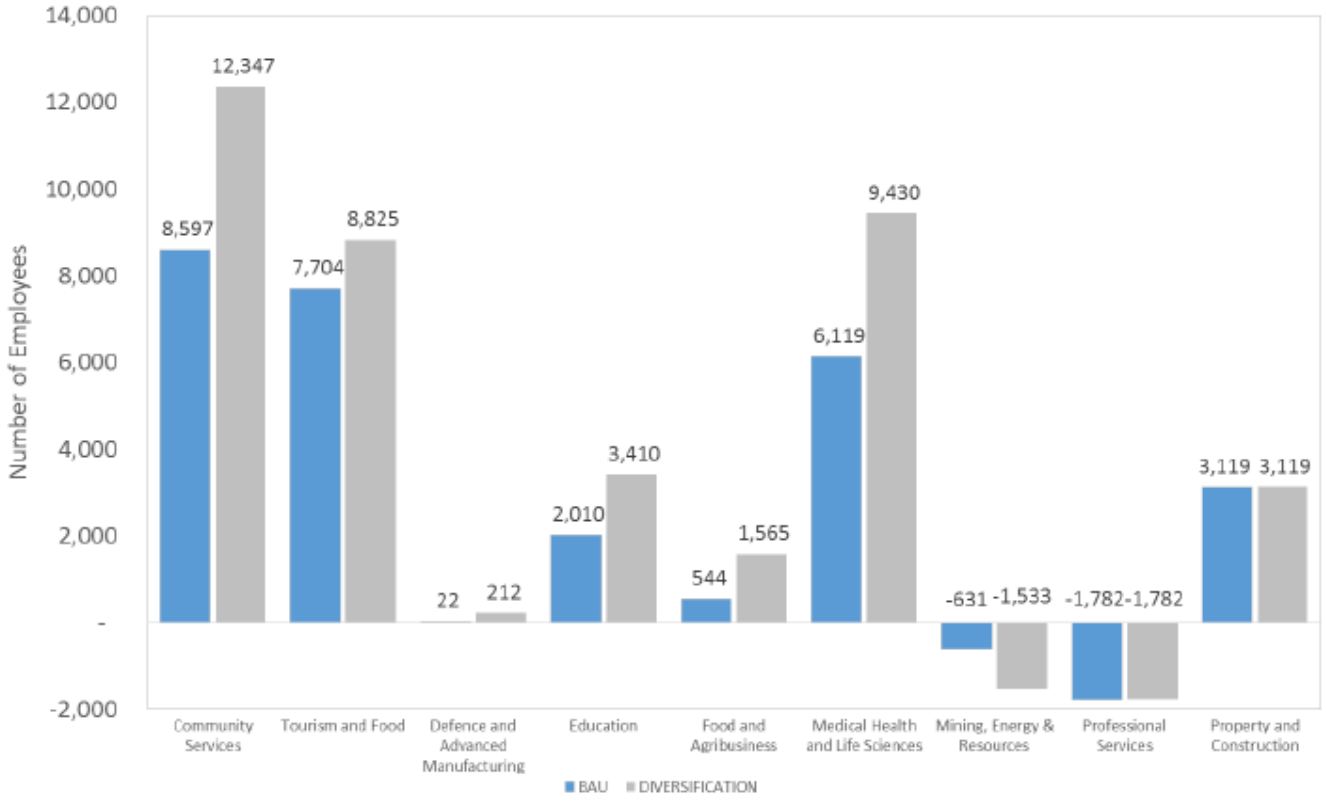
Table 38 - Employment growth to 2038 (Colliers International, 2019)

Neighbourhood	Existing workers 2016	Additional workers to 2038	Estimated total workers 2038
Central Perth	84,840	39,405	124,245
Claisebrook	7,128	3,311	10,439
Crawley-Nedlands	13,893	6,453	20,346

East Perth	9,711	4,510	14,221
Northbridge	11,960	5,502	17,462
West Perth	21,477	9,975	31,452
TOTAL	149,009	69,156	218,165

In addition to the estimates above, the Commercial Land Use Trends Analysis and Demand Forecast examined the impact of a 'diversification scenario' on employment growth within Perth city. This diversification scenario is derived from the Pracsys Economic Future Scenario Assessment (Pracsys, 2017), and was found to deliver an additional 9,890 employees by 2038, compared to the business as usual trends shown in **Table 38**. The growth in workers across the key employment sectors under the diversification scenario is illustrated in **Figure 34**.

Figure 34 - 20-year employment growth - BAU vs Diversification scenario



1.4. Natural Environment

1.4.1. Existing profile and trends

The natural environment is a key component of Perth city's fabric. It provides the physical conditions upon which the city has developed and contributes daily to the human enjoyment of the city and its landscape. The natural environment is central to Perth city's 'sense of place.'

1.4.1.1. State Planning Policy No. 2

State Planning Policy No. 2, provides guidance for the protection, management, conservation and enhancement of the natural environment. The objectives of this policy are:

- To integrate environment and natural resource management with broader land use planning and decision-making;
- To protect, conserve and enhance the natural environment; and
- To promote and assist in the wise and sustainable use and management of natural resources.

The State Planning Policy No. 2 objectives and policy measures are reflected in the consideration of the following sections of this document related to Perth city's natural environment.

1.4.1.2. Swan River

The Swan River is an important attribute of Perth city, contributing to both its environmental and social fabric. The Swan-Canning sub catchment area covers 2,090sqm of the much larger Swan Avon catchment area (approximately 126,000sqm) (Department of Parks and Wildlife, 2015). It is located on the northern intersection of the Swan River's lower and middle estuary systems, where the water quality ranges from good (lower estuary) to poor (middle estuary).

Between 1883 and 1967, significant areas of the Perth foreshore were reclaimed from the river (refer to **Figure 35** and **Figure 36**)**.** It should be noted that much of the reclaimed foreshore is currently within the floodplains affected by the 1:100-year storm events (refer to **Figure 36**) (City of Perth, 2018[a]).

The Swan River foreshore is ecologically sensitive and continues to experience some habitat/biodiversity loss, pollution impacts and foreshore degradation (due to urbanisation and the effects of climate change).

The City takes fortnightly microbial water samples from the Swan River at eight locations from Crawley to Claisebrook, between November and April each year. Analysis of these water samples assists in the early detection of water quality issues, which may impact water users. Results since 2012 have indicated fair to good water quality – with opportunities for improvement. Sources of microbial pollution include storm-water and construction site runoff, animals and boating wastes.

Figure 35 - Areas of reclaimed land within Perth city

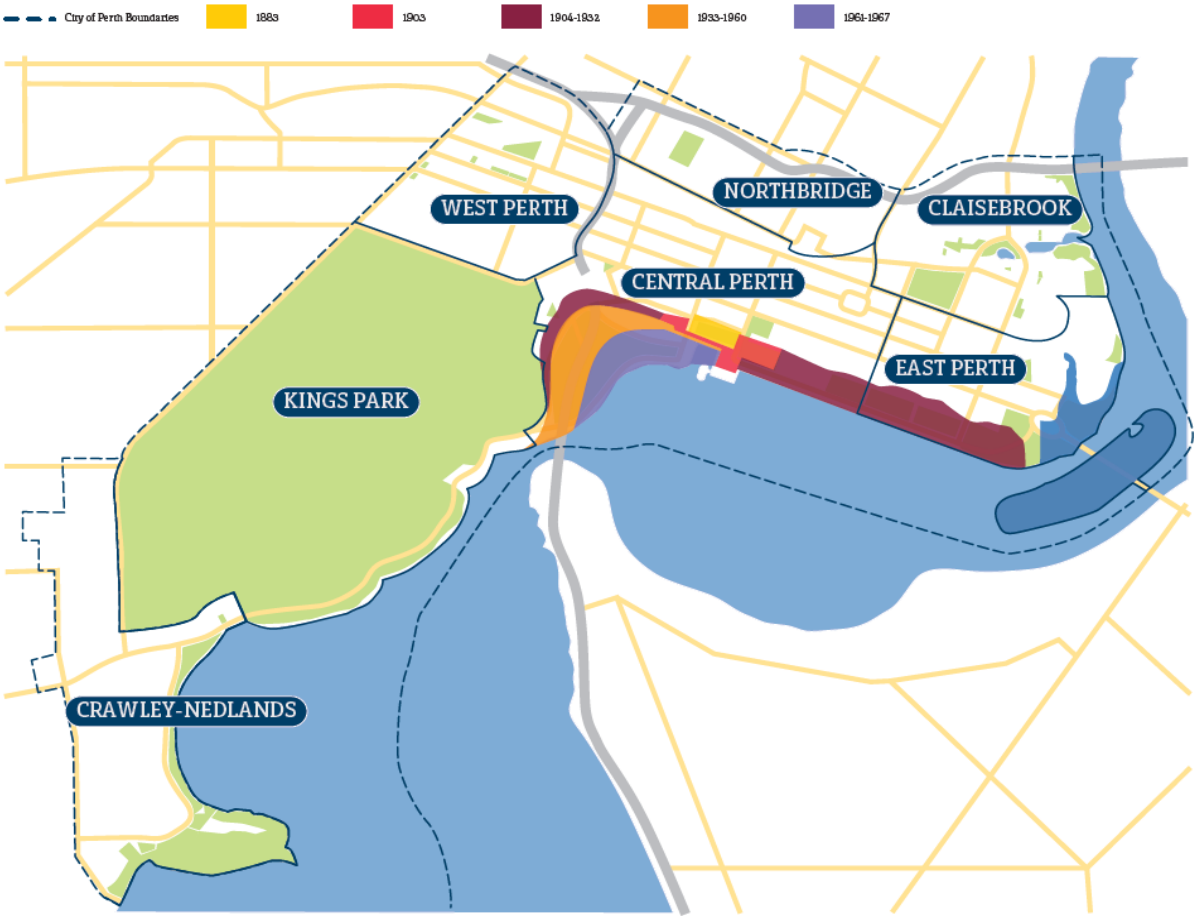
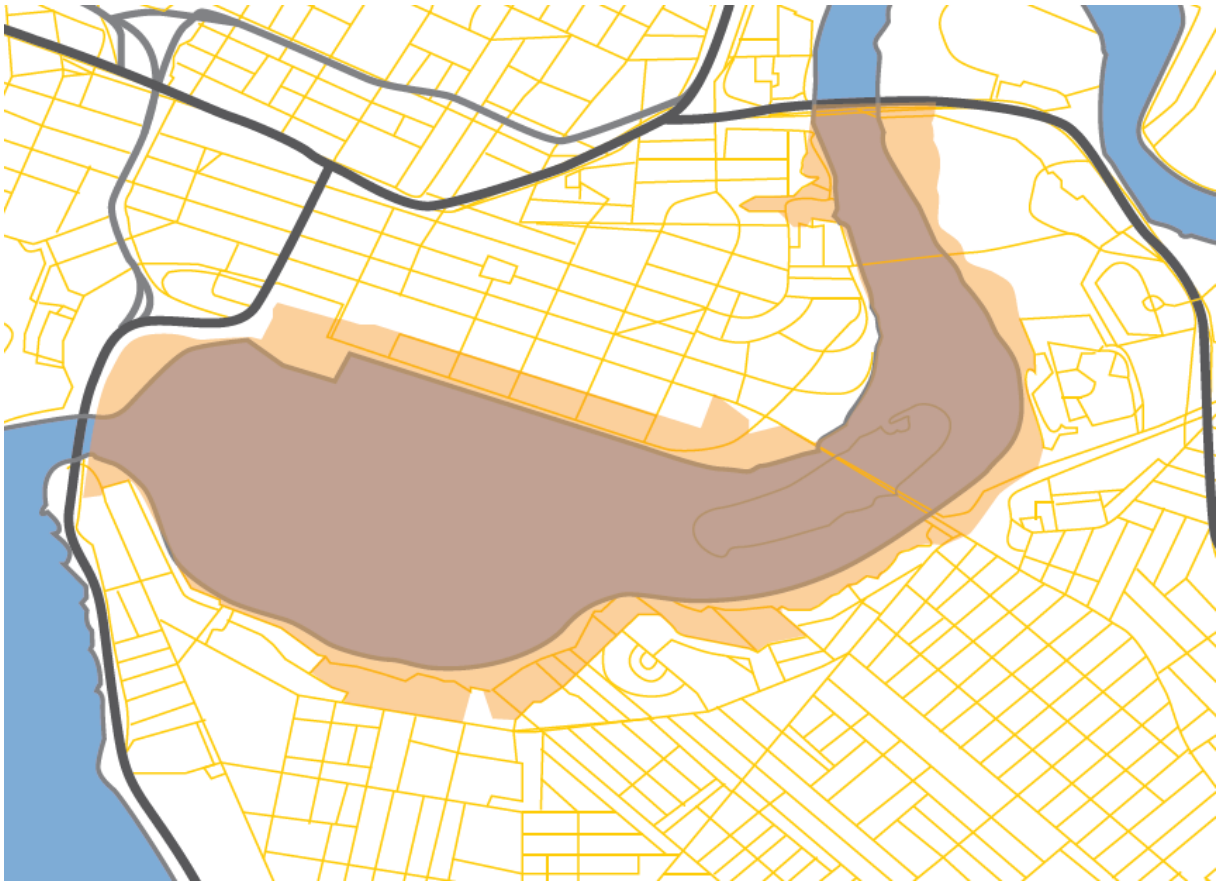


Figure 36 - Area subject to flooding within Perth city (City of Perth, 2018[a])

The Perth Water Buneenboro Locality Plan is currently being prepared by the Department of Biodiversity, Conservation and Attractions. The Perth Water Locality is identified as the section of the Swan River and its foreshore between the Narrows and Windan bridges (refer to **Figure 37**). The locality plan is being developed as a framework to determine acceptable developments and uses for the area, based on defining landscape characteristics, community aspirations and environmental and cultural value.

The development of the Perth Water Buneenboro Locality Plan is being overseen by the Perth Water Vision Group, which is comprised of the various State and local government agencies. Future land use and development strategies and actions recommended by the Local Planning Strategy for land within the Perth Water Buneenboro Locality Plan, should align with the future prepared framework's vision and objectives.

Figure 37 - Perth Water Buneenboro Locality Plan study area (Department of Biodiversity, Conservation and Attractions, 2018)



1.4.1.3. Wetlands

Historically, there was a chain of wetlands extending across the northern area of Perth City (now East Perth and Northbridge) to Lake Monger, which shaped the original planning of the Swan River Colony settlement, giving rise to the east-west alignment of roads.

The majority of these wetlands have been constructed over, however, some have either remained or been modified as the city's landscape evolved.

shows the original locations of the wetlands, with the current city landscape superimposed (City of Perth, 2018[a]).

Figure 38 - Location of original wetlands

1.4.1.4. Soils

There are three naturally occurring types of soil in Perth city:

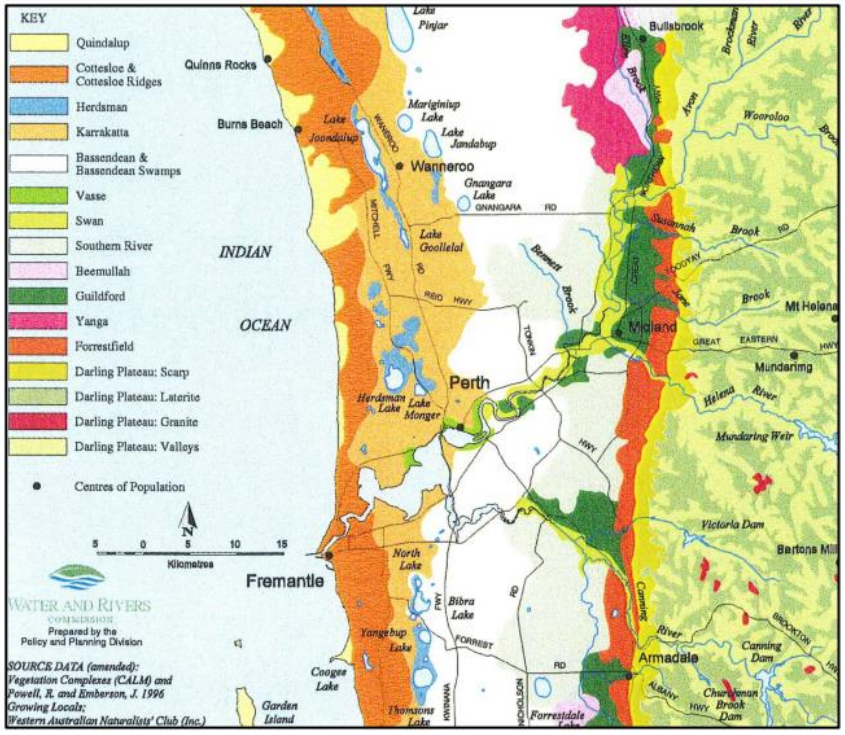
- Vasse soils – along the river foreshore;
- Herdsman soils – marking the location of the former wetlands; and
- Karrakatta sands – across the remainder of the City of Perth.

Figure 39 shows the locations of soil types for the metropolitan area, including Perth city.

Imported soil was also used to assist in the creation of the Narrows interchange, and dredged material from the bed of the Swan River was used to shape Heirisson Island and parts of the foreshore (Claisebrook Catchment Group Inc, 2008).

The location of the city amongst reclaimed foreshore and wetlands also means that the impacts of acid sulfate soils need to be addressed and managed when considering new development in certain areas. The need for specific planning provisions will be investigated when preparing the new scheme.

Figure 39 - Soil types of the Swan River system and surrounding areas (Department of Biodiversity, Conservation and Attractions, 2016)



1.4.1.5. Climate change

Climate change is a significant challenge facing Perth city, and will require concerted action to reduce the potentially severe consequences. In May 2018, the City completed its Climate Change Adaptation Plan, developed in line with the Commonwealth Government's *Climate change impact and risk management framework – A Guide for Business and Government* and the *International Standard AS/NZ ISO 31000:2009 – Risk Management*. The guidelines provide a structured, systematic approach to establishing the context, identifying risks, analysing risks, evaluating risks and treating risks. It has been developed to support climate-resilient development, through the implementation of relevant adaptation actions.

The implementation of relevant adaptation actions identified in the Climate Change Adaptation Plan will support the City to effectively address and manage the risks of climate change.

1.4.1.6. Greenhouse gas emissions

An inventory of greenhouse gas emissions (GHG) was calculated for Perth city (prior to the 2016 integration of Crawley-Nedlands) using the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories, an accounting and reporting standard used by the City as signatory to the Compact of Mayors (City of Perth, 2016).

In 2014-15, the inventory found 90% of GHG emissions in Perth city were generated by non-residential activity, which reflect the size of the City's economy and the influx of workers from outside the City each day. By sector (i.e. places where emissions are generated), buildings generated 63% of emissions, and transport 35%. By source, electricity was by far the largest source of emissions (59%).

In comparison to the cities of Melbourne and Sydney, Perth city emits:

- A significantly lower amount of GHG through buildings; and
- A significantly higher amount of GHG through transport.

The significantly higher amount of GHGs emitted from transport may reflect higher levels of reliance on private car use, and lower-levels of public transport use, to access employment in Perth city from across Greater Perth (compared with Melbourne and Sydney).

1.4.1.7. Water consumption

In 2017, the City was benchmarked using the Water Sensitive Cities (WSC) Index tool to rate how the overall management of its water was fairing in terms of its sustainability outcomes. The initial assessment produced the Water Sensitive Cities Index Report 2017 and these results fed into the City's Water Sensitive City Study 2017 (City of Perth, 2017[b]). The study identified Perth city's water consumption baseline and business as usual forecast consumption to 2036 across sectors. The study also identified water saving practices that could reduce the city's consumption if implemented. The results are summarized in refer to **Table 39**.

Table 39 - Water use consumption of varied scenarios by 2036 across the City of Perth

	2016	2036				
		Business as usual (kL)	Water efficient behaviour savings (kL)	Water efficient infrastructure savings (kL)	Water sensitive city	
					Total savings (kL)	Resulting water consumption (kL)
City of Perth operations	1,039,277	1,341,711	69,249	201,257	270,505	1,071,206
Residences	1,656,545	2,501,340	125,067	250,134	375,201	2,126,139
Hospitality	570,718	627,790	31,389	62,779	94,168	533,621
Commercial	1,408,776	1,760,970	88,049	176,097	264,146	1,496,825
General industry	1,332,737	1,532,648	76,632	153,265	229,897	1,302,750
Private groundwater use	2,960,770	2,960,770	148,039	296,077	444,116	2,516,655

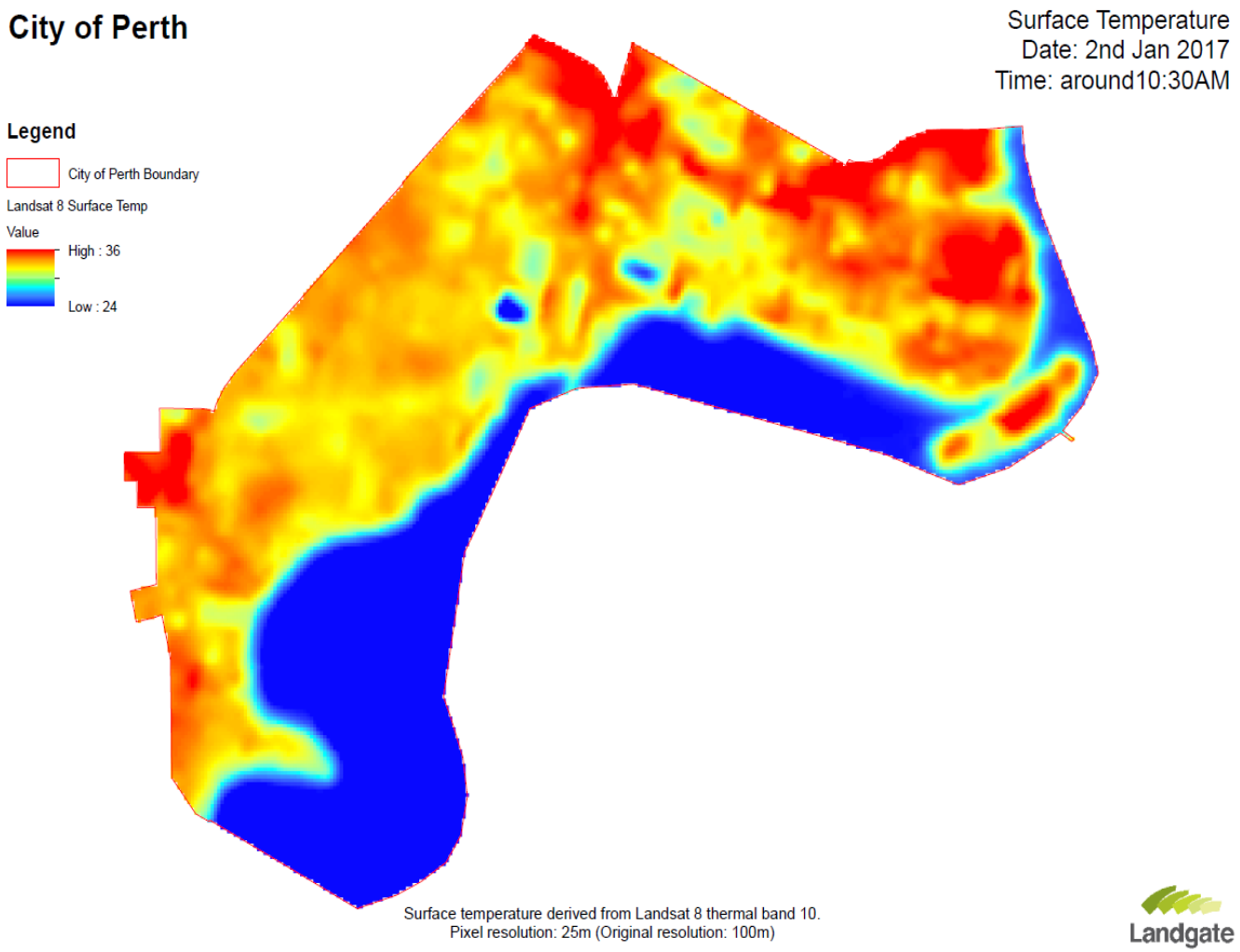
1.4.1.8. Urban heat island effect and hot-spot areas

Cities are generally hotter than surrounding less built up areas – sometimes by as much as one to three degrees Celsius. Urban surfaces can be highly effective at absorbing and storing heat during the day, creating higher daytime temperatures. This heat is then released at night, leading to higher temperatures after dark. This phenomenon is known as the 'urban heat island effect' (UHI).

'Hot-spot' areas (City of Perth, 2016[a]) tend to be located where there is a high concentration of hard surfaces such as roads, railway lands, and large areas of unirrigated natural surfaces. Research undertaken for the City's Urban Forest Plan has indicated that the city currently has several temperature 'hot-spot' areas (refer to **Figure 40**).

Some of these hot-spots are in residential areas and around major gathering places. They also appear to correlate to those parts of the city with lower levels of canopy cover. Perth's urban heat island effect contributes to higher city temperatures, with potentially negative impacts on city liveability and community health and wellbeing. With Perth city temperatures predicted to rise, this situation may worsen over time. Planting more trees to increase the level and quality of canopy cover in hot-spot areas will assist in reducing these impacts.

Figure 40 - Hotspot locations across Perth city (City of Perth, 2016[b])

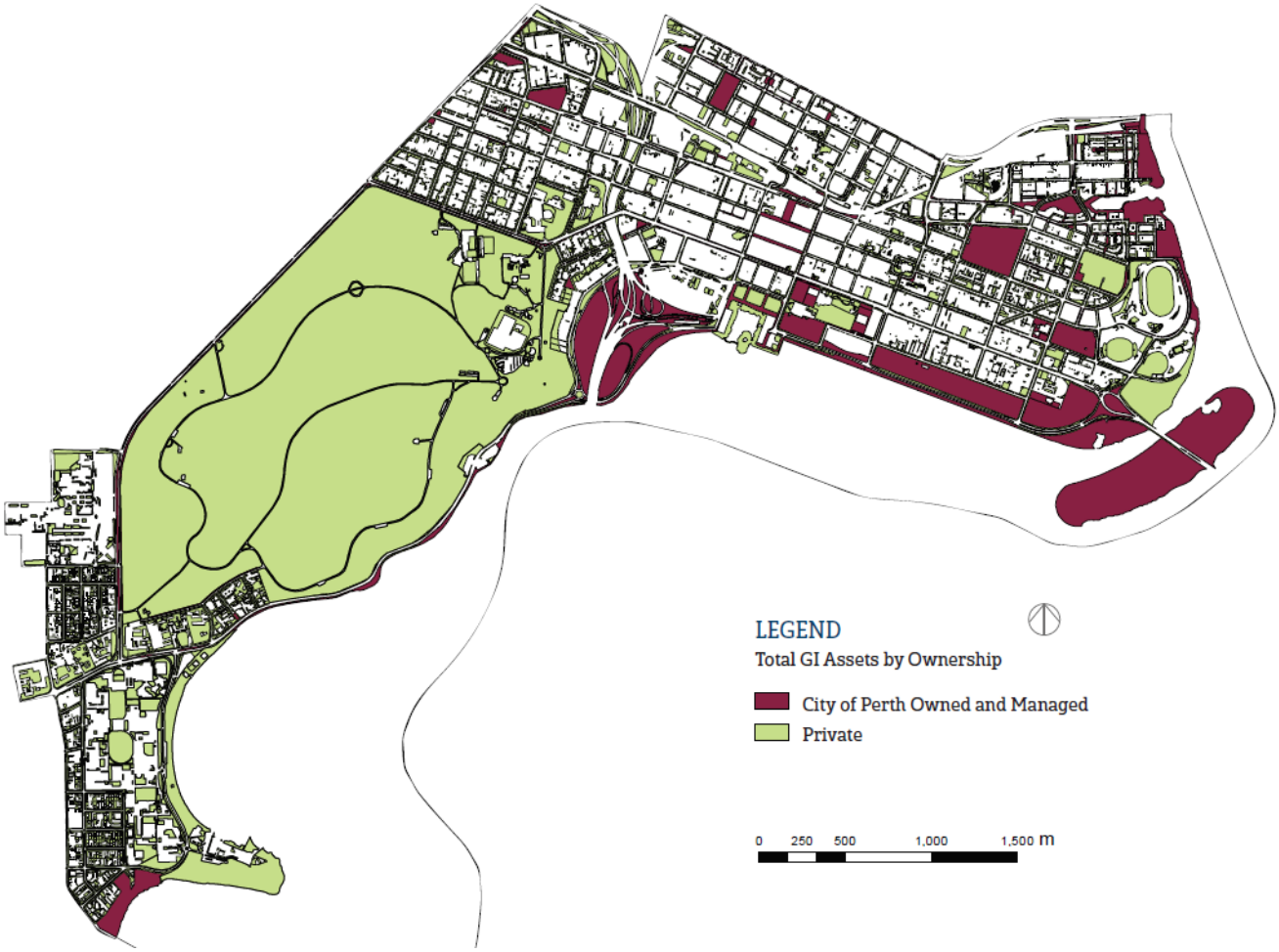


1.4.1.9. Biodiversity

The presence of two threatened ecological communities, listed under the *Environment Protection and Biodiversity Conservation Act 1999,* have been recorded in the City – including Banksia Woodland of the Swan Coastal Plain and Subtropical and Temperate Coastal Saltmarsh. The Subtropical and Temperate Coastal Saltmarsh at Heirisson Island supports two ant species and a butterfly that are only present in this region because of the saltmarsh.

Approximately 65% of the city is terrestrial or land-based habitat (and some minor wetlands) – with the remaining (35%) comprising the Swan River estuary. Of the terrestrial habitat, 746.4 hectares has been recorded as 'green infrastructure' (refer **Figure 41**).

Figure 41 - Total green infrastructure assets by ownership (City of Perth, 2017[a])

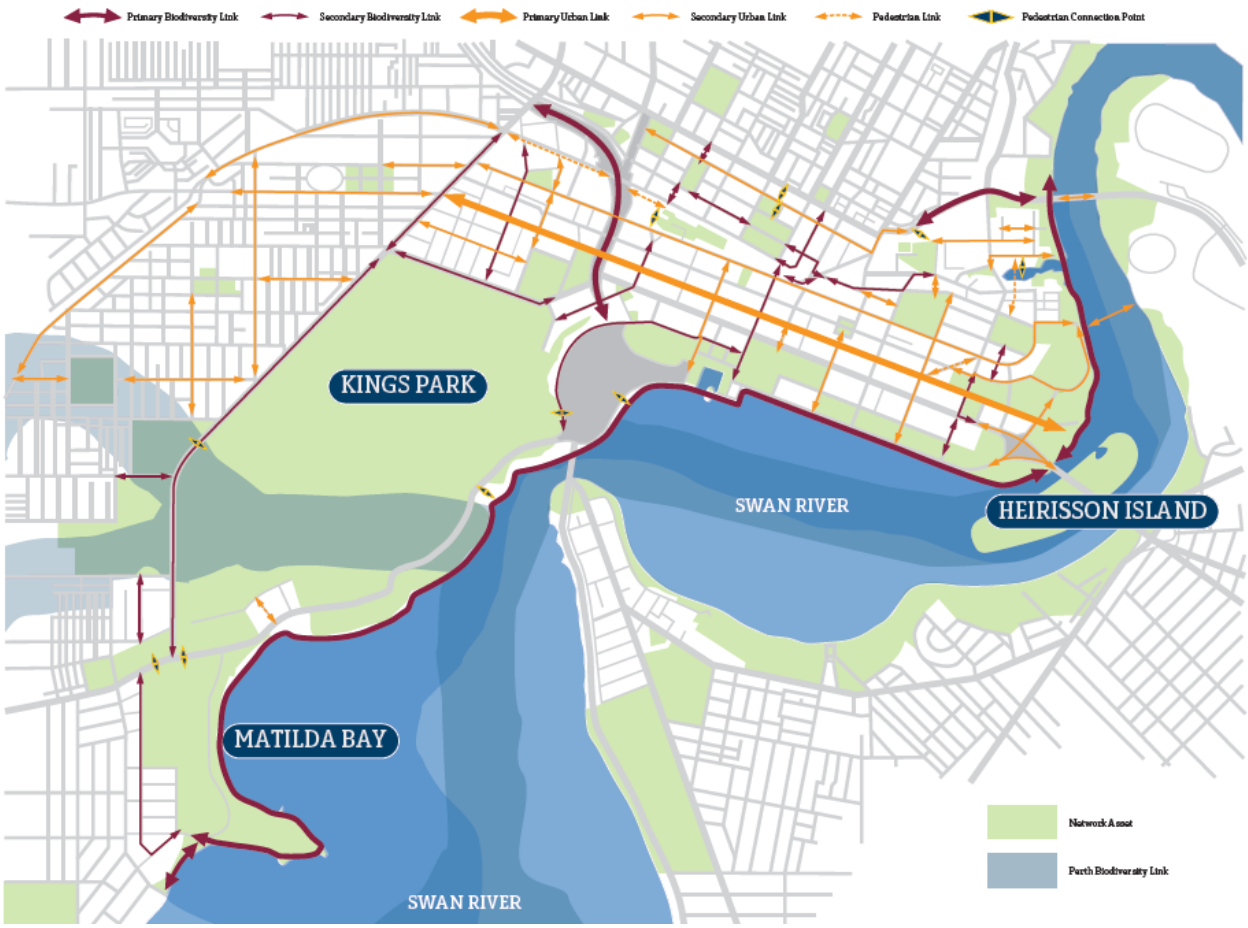


Of the 'green infrastructure' throughout the city, 27% of flora was composed of WA native flora, 21% was non-West Australian native flora and the remainder (52%) was composed of exotic species.

Studies of Perth city's green infrastructure led to the design of a green infrastructure network (refer **Figure 42**). The green infrastructure network integrates a range of biocultural features and uses to create robust and meaningful green linkages throughout the city. Although the expansion and enhancement of these linkages relies primarily on green infrastructure within public spaces (parks, foreshore, verges, and medians), they can be supported by the greening of adjacent private spaces and developments.

The types of connectors that form the overall network are broadly classified into 'biodiversity' and 'urban' connectors or links in accordance with previous studies and reports created at the local and regional scale (Western Australian Local Government Association, 2017 and Alan Tingay and Associates, 1998).

Figure 42 - Green infrastructure network for the City of Perth (City of Perth, 2017[a])

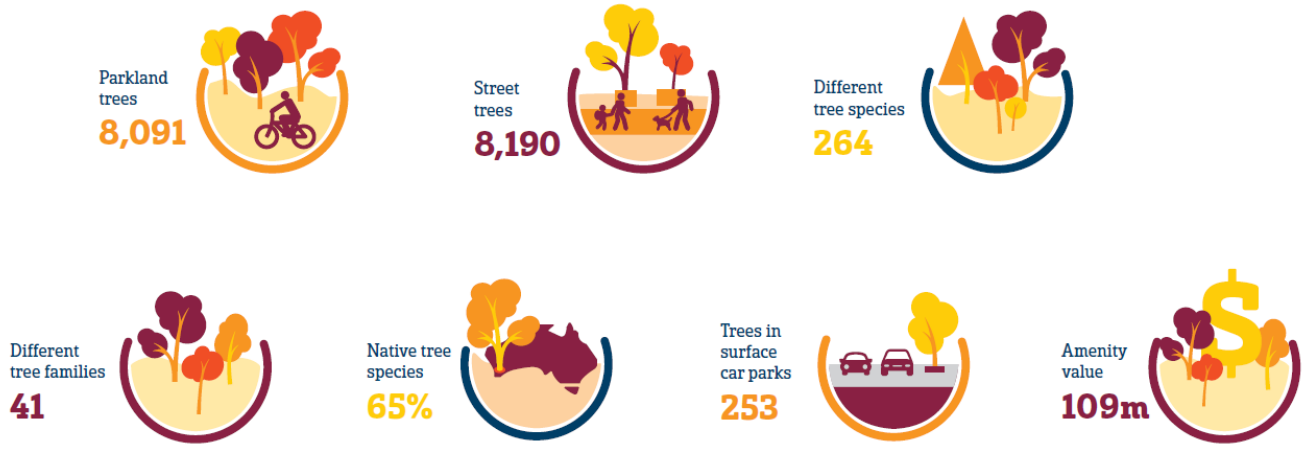


1.4.1.10. Urban forest

An urban forest is broadly defined as the collection of green spaces, trees and other vegetation that grows within an urban area, on both public and private land. The City's urban forest is a valuable asset and key element of city infrastructure which improves liveability, community health and wellbeing. It also contributes to the creation of a climate-resilient city, and helps improve overall environmental quality (refer to **Figure 43**).

At present, there are an estimated 14,811 street and parkland trees in Perth city (pre-July 2016 boundary, excluding Kings Park). These provide an estimated total canopy cover of 10.7% of the city's land area, which is considered low. In July 2016, the City acquired an additional 1,590 street and parkland threes through the amalgamation of parts of the City of Subiaco and City of Nedlands which has an estimated canopy cover of 27%. A further 133 trees were added to the urban forest upon completion of Elizabeth Quay by Development WA.

Figure 43 – Perth city street and parkland tree facts



The City's Urban Forest Plan is a strategic action plan that aims to promote the long-term health and resilience of the city's urban forest – and maximise the level of community benefits it can deliver. The plan recognises and values the urban forest as an important asset, and a key element of city infrastructure.

The Urban Forest Plan is being developed in three stages. Stage One has been completed, and focuses on the city's population of street and parkland trees. Stages Two and Three are currently in development. Stage Two will address trees on private property, while Stage Three focuses on the other vegetation that makes up the urban forest – including wider elements of green infrastructure.

Through a targeted program of new tree planting, the City is aiming to increase the level of canopy over a 30-year period. New tree planting will be prioritised in temperature 'hot spots' and spaces with high levels of pedestrian activity – to help reduce city temperatures and promote urban cooling.

1.4.1.11. Bush Forever

Three open space areas within the city are classified as Bush Forever sites:

Bush Forever Site	Description
No.317 – Kings Park Escarpment	276 hectares of the escarpment of Kings Park – behind the old Swan Brewery – containing remnant vegetation.
No.402 – Pelican Point in Crawley	Pending Threatened Ecological Community classification due to temperate coastal saltmarsh. One of three locations in the Swan River that form the Swan Estuary Marine Park – where 'internationally protected waders visit every summer coming from far away areas such as Asia, Mongolia and Siberia' (City of Perth. 2017[a]). JH Abrahams Reserve is a part of this site.
'Other native vegetation' – Heirisson Island (south-east corner)	Heirisson Island has a Threatened Ecological Community classification – due to its subtropical and temperate coastal saltmarsh.

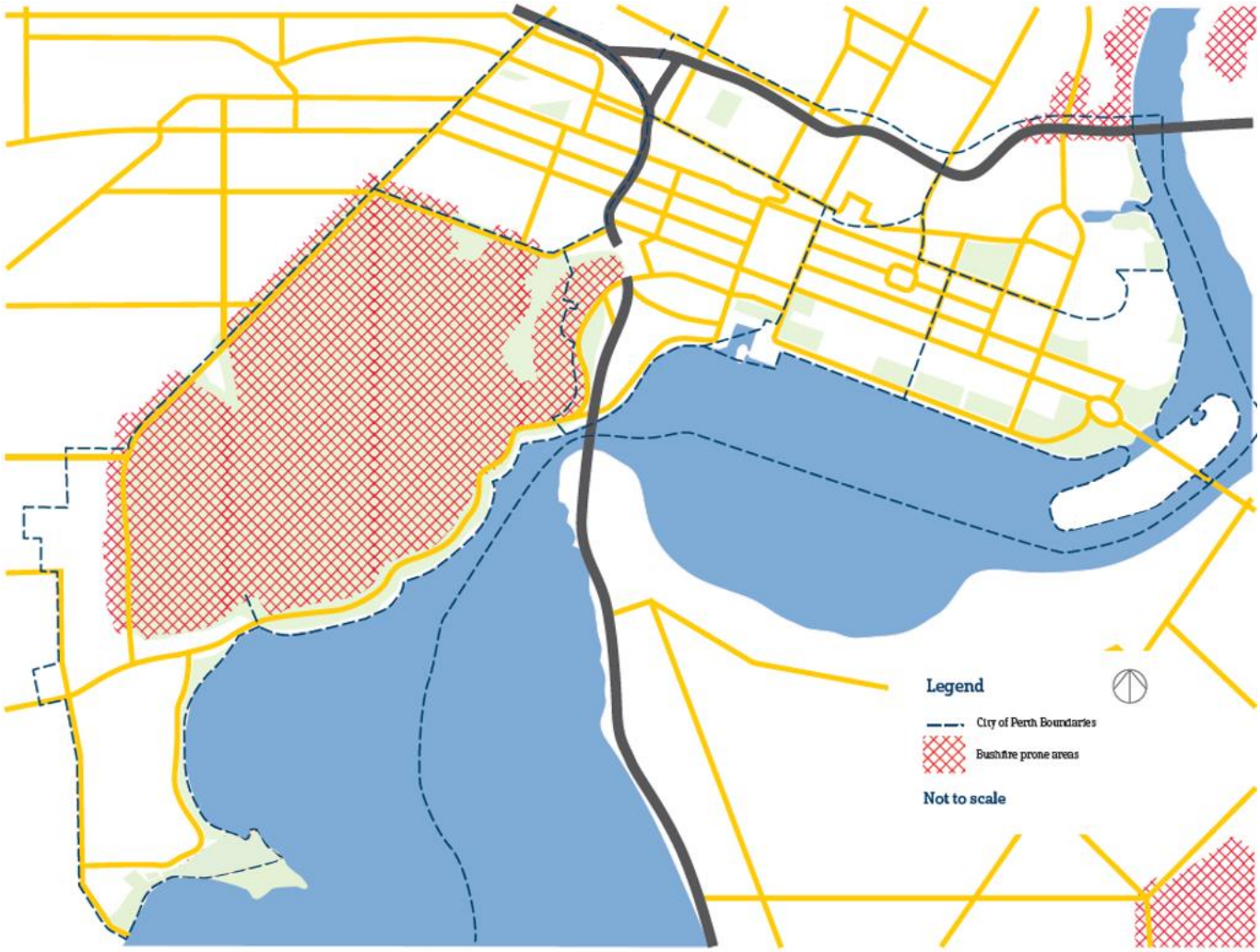
Bushfire prone areas

Climate change is projected to result in harsher bushfire weather. The Department of Fire and Emergency Services (DFES) Map of Bushfire Prone areas identifies two areas in Perth city as bushfire prone:

- Kings Park; and
- Portion of the Graham Farmer Freeway reserve.

The areas classified as bushfire prone are illustrated in **Figure 44**).

Figure 44 - Bushfire prone areas within the City of Perth



In 2017, the City undertook a Bushfire Risk Management Plan (City of Perth, 2017[c]) which produced Bushfire Attack Level (BAL) contour plans of bushfire prone areas across the city. These contour plans revealed high-risk areas (BAL FZ-40) within Kings Park with moderate-low risk areas (BAL 29-low) extending onto areas adjoining the park including along Kings Park Road, Mounts Bay Road, Park Avenue and Winthrop Avenue/Thomas Street.

Although not identified as a bushfire prone area by DFES (refer Figure 44), the City's Bushfire Risk Management Plan revealed the Pelican Point conservation area in Crawley as a bushfire prone area (BAL FZ-40) with moderate-low risk areas (BAL 29-low) extending across the Matilda Bay Sailing Club and a portion of UWA.

The areas identified as bushfire prone under the Bushfire Risk Management Plan BAL contour map are illustrated in **Part 1 –Figure 8**.

1.5. Built environment

1.5.1. Existing profile and trends

Buildings and the urban spaces they create have a major impact on the city and its liveability, productivity and sustainability. The City's Urban Design Framework, 2010 states that:

'the built form of the city is the most recognisable and influential element of the city. It is the container of activity, the signifier of Perth's centre to the rest of the surrounding metropolitan area; and the canvas of architectural expression.'

An understanding of Perth city's built environment provides a picture of how well placed it is to fulfil its social, economic, cultural, environmental and civic role as the capital city of Western Australia (Western Australia Government, 2016).

1.5.1.1. City form

Structure and grain

The structure and grain of Perth city dictates how easy it is to move about the city, and how it functions. It also influences the diversity of ownership and land uses, interest at street level, lot orientation and building design response.

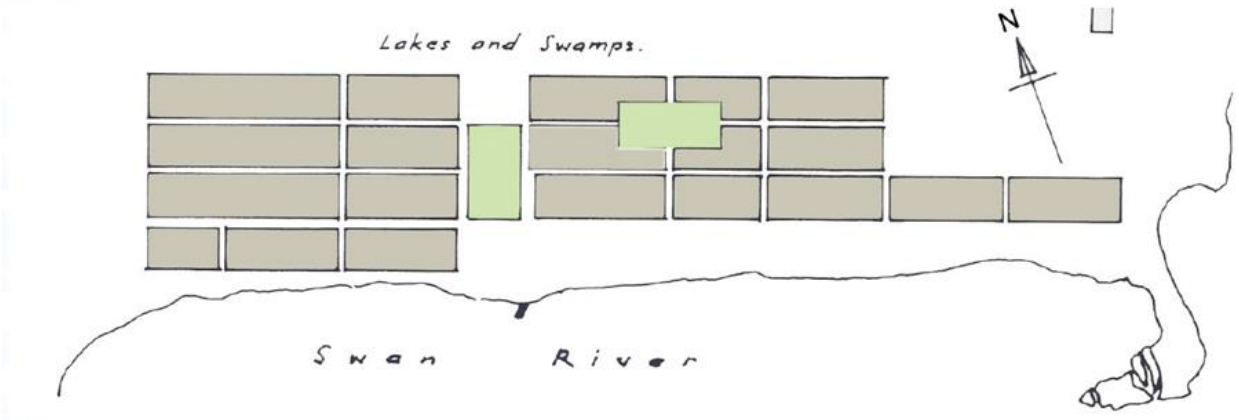
The city's layout and functionality is influenced by its natural topographical features, such as the Swan River and Kings Park, as well as major transport infrastructure such as the Mitchell Freeway, Graham Farmer Freeway, the railway line, Thomas Road/Winthrop Avenue and Stirling Highway. This has resulted in some areas of the city being well integrated with each other (as well as with areas outside of the city) and other areas being relatively physically isolated.

A number of major east-west streets connect East Perth through to the city core, West Perth and beyond, whilst a number of north-south streets connect Perth city to the inner-urban neighbourhoods to the north and the Graham Farmer Freeway.

The size of the city's street blocks affects the ease of movement throughout the city, whilst the orientation of the city's street blocks dictates the orientation of lots and, therefore, building design response.

The length of river frontage and the alignment of the railway (previously lakes and swamps) dictated the central city's strong east-west street block orientation, resulting in lots that are orientated north-south.

Figure 45 - Perth townsite plan 1829



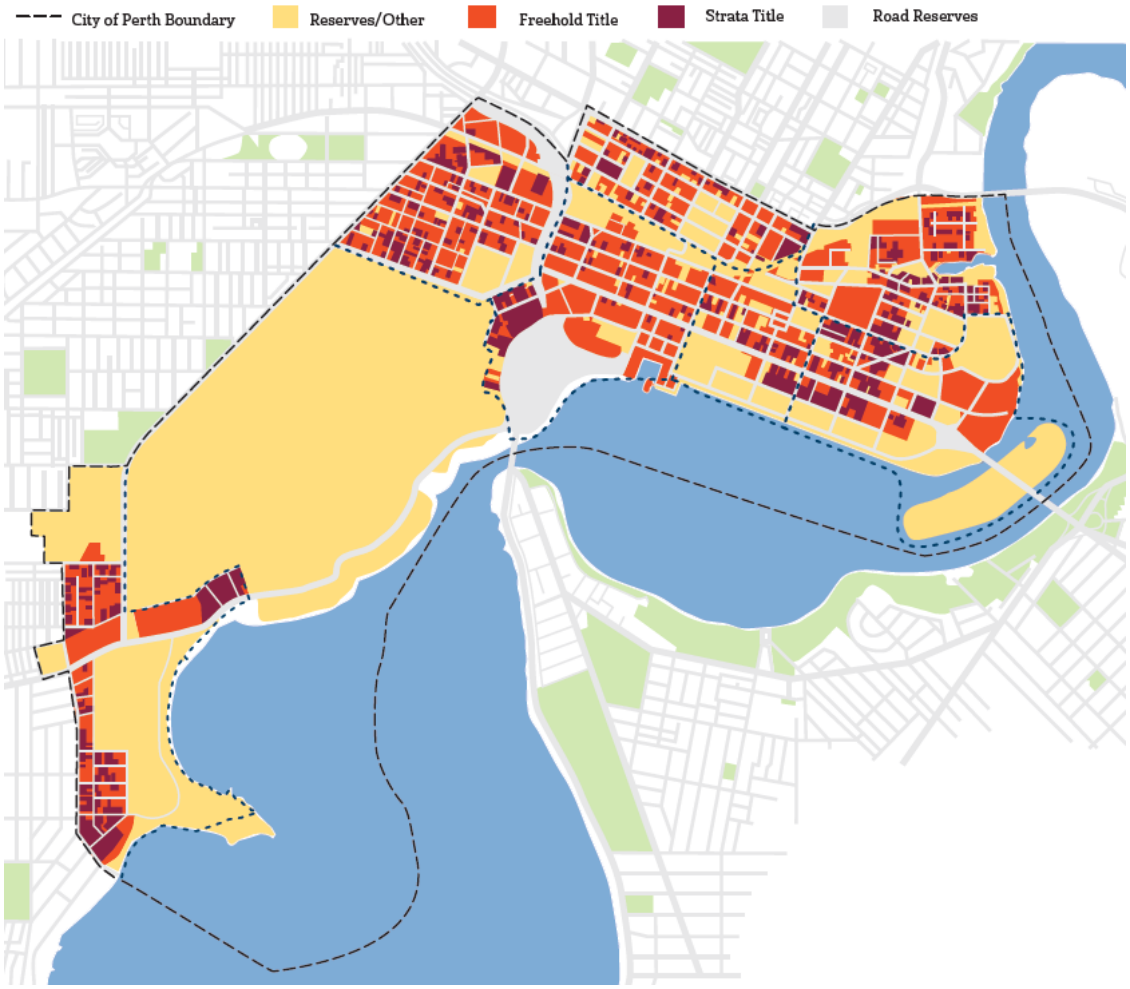
Beyond the central city, street blocks vary in orientation, configuration and size. Whilst street blocks across the city are generally regularly sized and shaped, large street blocks can be found where institutional uses reside, particularly in East Perth and Crawley-Nedlands.

Parts of the city are serviced by laneways, some which form part of well-connected systems and others have

varied degrees of connectivity. Well-connected systems of laneways can be found in West Perth and Nedlands, which enable the dispersal of vehicular traffic in these areas.

Over half of the total land area of Perth city is set aside as reserves (approximately 53%) (City of Perth, 2016[a]). This includes major assets such as Kings Park, river foreshore areas, Parliament and Government Houses and their grounds, as well as other crown leases for varying uses – including the University of Western Australia, Royal Perth Hospital, QEII Medical Centre, Gloucester Park, the WACA and the Perth Exhibition and Convention Centre. A further 18% is set aside for roads, railways and public utilities. The remaining 29% of land within the city is made up of freehold and strata titled developments (refer to **Figure 46**) (Western Australia Government, 2016).

Figure 46 - Land tenure

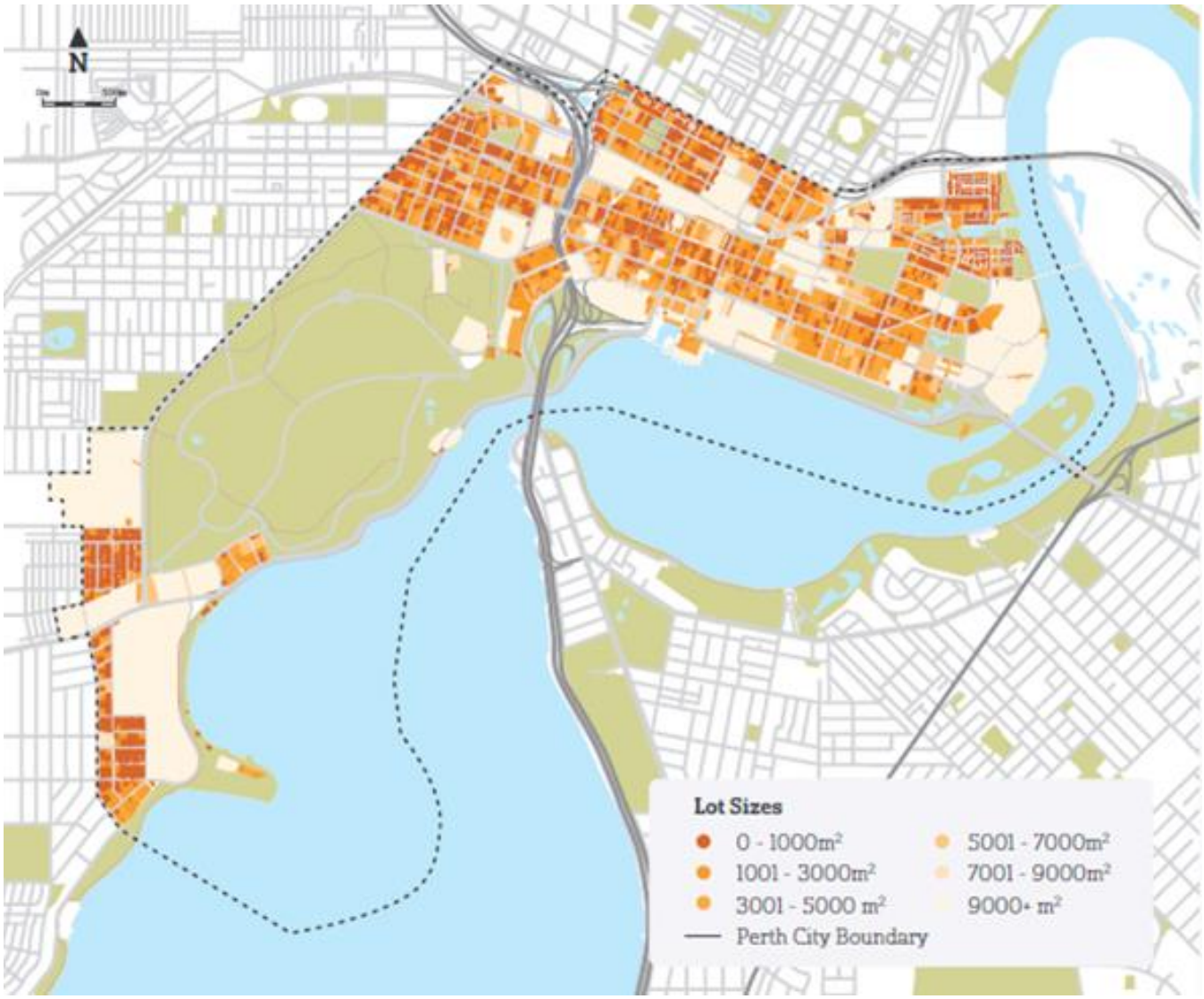


Lots sizes within Perth city are predominantly less than 1000sqm (approximately 76.4%). Some concentrations of medium-sized lots (between 1,001sqm and 9,000sqm) can be found along Terrace Road in East Perth, Mounts Bay Road in Crawley and to the north of the McIver train station. Most large lots that consist of greater than 9000sqm accommodate government institutional uses – or are located within State Government redevelopment areas. The diversity of lot sizes within Perth city is outlined in **Table 40** and shown in **Figure 47**.

Table 40 - Diversity of lot sizes in 2016

Category (m^2)	Count	%
0–1000	4,670	76.4
1001–3000	1,035	13.8
3001–5000	213	2.8
5001–7000	77	1.0
7001–9000	13	0.2
9001+	107	1.4
TOTAL	6,115	100

Figure 47 - Diversity and distribution of lot sizes (City of Perth, 2016[a])



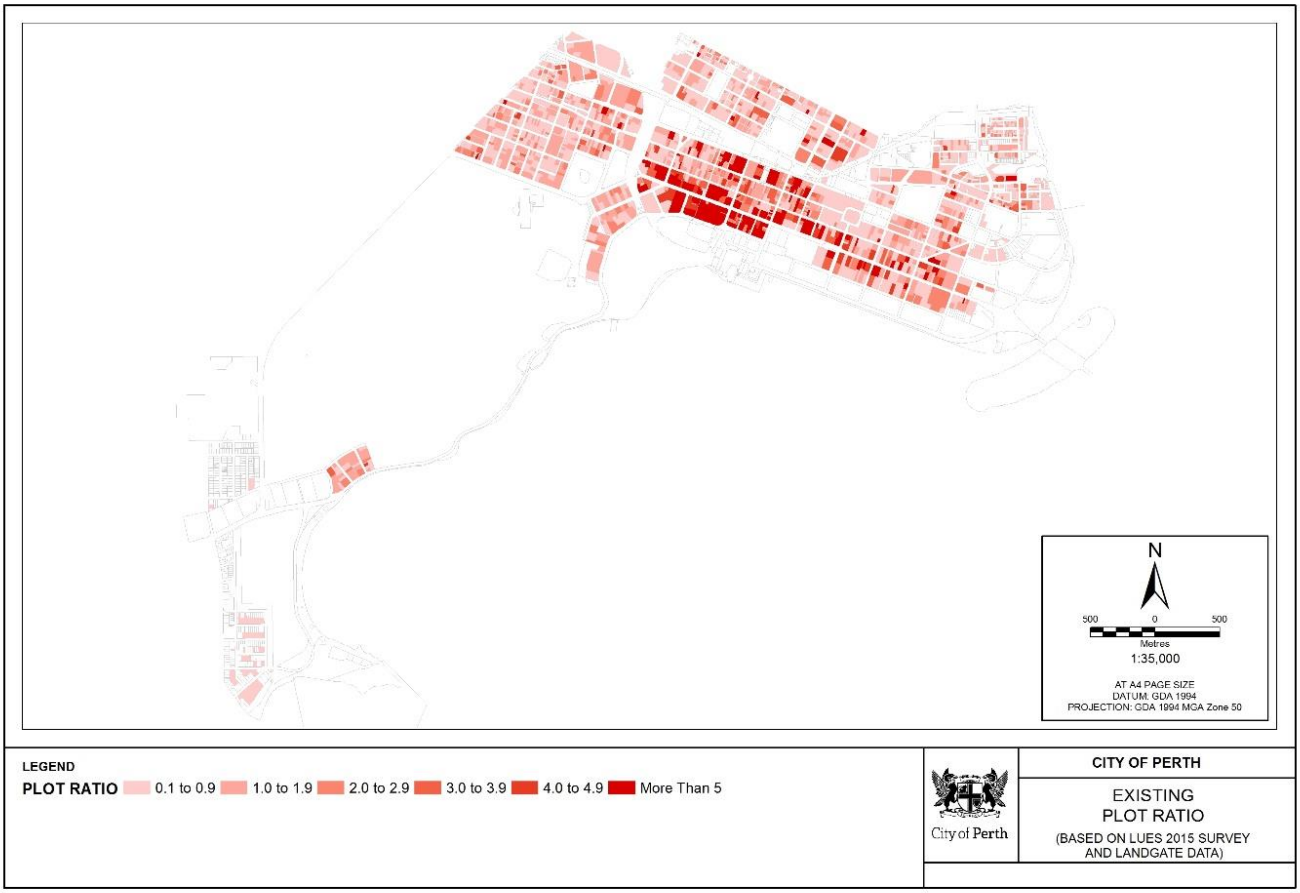
Intensity of development

The density of development or floorspace generally determines the levels of residents, workers and visitors and therefore, the activity in the city. It is also closely linked to built form outcomes, particularly heights, which influence the character, identity and legibility of the city.

The estimated floorspace (NLA – Net Lettable Area) in Perth city in 2015 was 6,342,978sqm – or an average of 6,447sqm of floorspace (NLA) per hectare (excluding Kings Park) (Department of Planning, 2015).

Figure 48 shows the existing intensity of floorspace and development across the city, with the greatest intensity of development being located within Central Perth, focused predominantly on St Georges Terrace (with some high intensity development also evident along Wellington Street). High intensity development can also be found along Adelaide Terrace in East Perth and within the area north of the McIver train station in Northbridge. Lower intensity development is evident in parts of Crawley-Nedlands, West Perth, Northbridge and Claisebrook.

Figure 48 - Existing Perth city plot ratio



The intensity of development, and the associated built form controls, defines the city skyline – which forms an important part of Perth city's identity. **Figure 49** shows the different skylines across the city from various angles. These show the tallest buildings being located within Central Perth, with a level of uniformity of height along St Georges Terrace and Adelaide Terrace and a general scaling down of buildings to the north and to the south towards the Swan River. Recent approved development has started to break this traditional pattern of development. Development in West Perth has generally sat below the Kings Park escarpment when viewed from the south.

Figure 49 - Perth City Skyline

1.5.1.2. Buildings

Built form typologies

'The built form creates the walls that define the streets and other urban space; sets the scale of streets, precincts and neighbourhoods; influences the way activities in buildings interact with the public domain and through overshadowing, influences the way people use urban spaces at different times of the year (City of Perth 2010).

A range of different building typologies have developed in Perth city over time – making a major contribution to the character and amenity of its neighbourhoods. Consistent patterns of height, footprint and architectural style are key elements of these built form typologies. A summary of the typologies in Perth city is provided here, while the characteristic built form typologies in each neighbourhood are discussed in more detail in the Neighbourhood profiles and analysis section of this report.

Large areas of the Central Perth, East Perth, West Perth and Northbridge neighbourhoods are characterised by building footprints that extend to the lot boundaries and create a continuous built edge along the street. In the areas with a retail and entertainment focus, the edge to the street is 'fine grain' – characterised by frequent entries, continuous shopfronts and awnings over the footpath. In the areas with a predominance of offices, there tends to be greater separation between entries and a continued emphasis on glazing.

In these areas, building height generally ranges from medium to high-rise – Perth city's tallest buildings are mostly located in the Central Perth neighbourhood on St Georges Terrace. These buildings are highly visible and recognisable from outside the city. In recent years, taller buildings have also been developed in the East Perth, West Perth (east of Havelock Street) and Northbridge neighbourhoods (east of Beaufort Street).

The exceptions to the pattern of greater height in these central neighbourhoods are the numerous institutional

and heritage buildings that are interspersed within them. These buildings are generally of lower height, in response to their function or limitations to structural capabilities at the time of their construction. The institutional buildings generally fulfil a regional or state role – and include Perth Arena, the Perth Convention and Exhibition Centre and the North Metropolitan TAFE. Heritage buildings are numerous and outlined in greater detail in section 1.5.1.3. There are several areas where streetscapes with buildings of cultural heritage significance and consistent architectural styles remain – such as in King Street, Queen Street, Barrack Street, William Street (in Central Perth and Northbridge), Hay Street Mall, Pier Street and Murray Street east. Some of these are formally identified as heritage areas on the State Heritage List or under CPS2.

Traditionally, many of the medium-rise buildings in these inner-city neighbourhoods did not have street or side-setbacks at the upper levels. This differed with the taller buildings seeking views across Greater Perth. However, over recent years, most new multi-storey buildings have generally included podiums at the base with greater setbacks from all elevations at the upper levels. This is partly a reflection of changes to the CPS2 provisions in 2014, which were intended to:

- Improve wind conditions and views of the sky from public areas;
- Provide a continuous active edge along the street for pedestrians; and
- Improve outlook and amenity within buildings.

The areas of Perth city where building footprints are setback from lot boundaries, provide a distinctly different streetscape. These areas often are, or were, predominantly residential. They include small areas in the west of Central Perth and Northbridge neighbourhoods, areas of the West Perth, East Perth and Claisebrook neighbourhoods and the majority of the Crawley-Nedlands neighbourhood. Activity centres located within some of these areas are the exception to the rule, as they commonly have traditional shopfronts with nil street setbacks.

The setback areas, particularly the street setback, often accommodate gardens and trees that provide softer and more informal edges. The extent and quality of landscaping varies and is often a product of the age and intensity of development on the lot. Older developments generally had smaller floor areas and, in the case of residential development, were smaller dwellings that required fewer car parking spaces. Redevelopments generally result in a greater intensity of development – with more floor area and a requirement for more car parking (particularly in the case of residential development). While often this car parking is provided in basements, these basements reduce the opportunity for deep soil zones for trees.

These areas mostly accommodate low to medium-rise buildings (generally up to 10 storeys). The low-rise residential buildings generally contain single houses and grouped dwellings, while the medium-rise residential buildings include apartments. The non-residential buildings are commonly office buildings, retail, dining and local services – as well as buildings on larger sites with varied (and often more extensive) footprints that fulfil a state or regional function. These include buildings like Parliament House, Gloucester Park, the WACA, UWA and QEII.

Building design quality

Building quality is complex – and is more than how well the building is constructed. It relates to its functionality, sustainability and aesthetics, both internally and externally. In 2016, the WAPC released a package of documents for public comment, as part of its Design WA initiative, to provide a framework to improve the quality of design in the built environment. These included the draft of State Planning Policy 7 – Design of the Built Environment, which is intended to establish the principles of good design that need to be applied to all new development. The proposed principles relate to:

- context and character;
- landscape quality;
- built form and scale;
- functionality and build quality;
- Sustainability;
- Amenity;
- Legibility;

- Safety;
- Community; and
- aesthetics.

While these can be used as measures of building quality, there is very limited available data relevant to these principles. However, some data is available in relation to the current functionality, sustainability, streetscape contribution and character of buildings within Perth city.

Environmental sustainability of development

The importance of environmentally sustainable design (ESD) in buildings is now widely acknowledged for its environmental, economic and social benefits. Environmentally sustainable design generally includes:

- energy resilience and low carbon emissions;
- efficient use of water;
- maximising indoor environmental quality;
- minimising waste;
- maximising reuse and recycling;
- resilience to increasing weather events; and
- promoting biodiversity, where possible.

The City recently commissioned a study to identify robust and viable 'best practice' planning options that promote high levels of environmental sustainability through the design of new buildings in the city (Environmentally Sustainable Design Options Analysis) (CNN, 2018). Part of this study involved a review of the current ESD performance of buildings in Perth city.

In 2016 over half (57%) of the city's greenhouse gas emissions were produced by non-residential buildings (primarily office, retail and institutional), while 6.0% were produced by residential buildings. This will change over time as more residential buildings are constructed.

A breakdown of total water use in the city in 2016 showed that residential, commercial and hospitality development accounted for 18%, 16% and 6.0% of total water use, respectively.

There is a range of rating tools available to measure the overall environmental sustainability of buildings – with Green Star being the most widely used at present. There are currently 14 (38%) four-star rated 'best practice standard' buildings, 21 (57%) five-star rated or 'excellence standard' buildings and two (5%) six-star rated or 'world leadership standard' buildings in Perth city. The low number of rated buildings and the four and five-star majority, suggests that there is significant room for improvement in the area of ESD.

The National Australian Built Environment Rating System's (NABERS) Office Energy and Water rating tools are also widely used – but only consider the one land use and the two specific areas of ESD. NABERS also have Indoor Environment and Waste rating tools that are not as widely adopted as energy and water rating tools.

In October 2018, there were 151 buildings and tenancies with a NABERS energy rating (i.e. whole building, base building and tenancies) in Perth city. Most had a rating of between three to 5.5 stars (which equates to average to excellent), with the average rating being 3.9 stars. This is above the state average of 3.6 stars but equal to the national average.

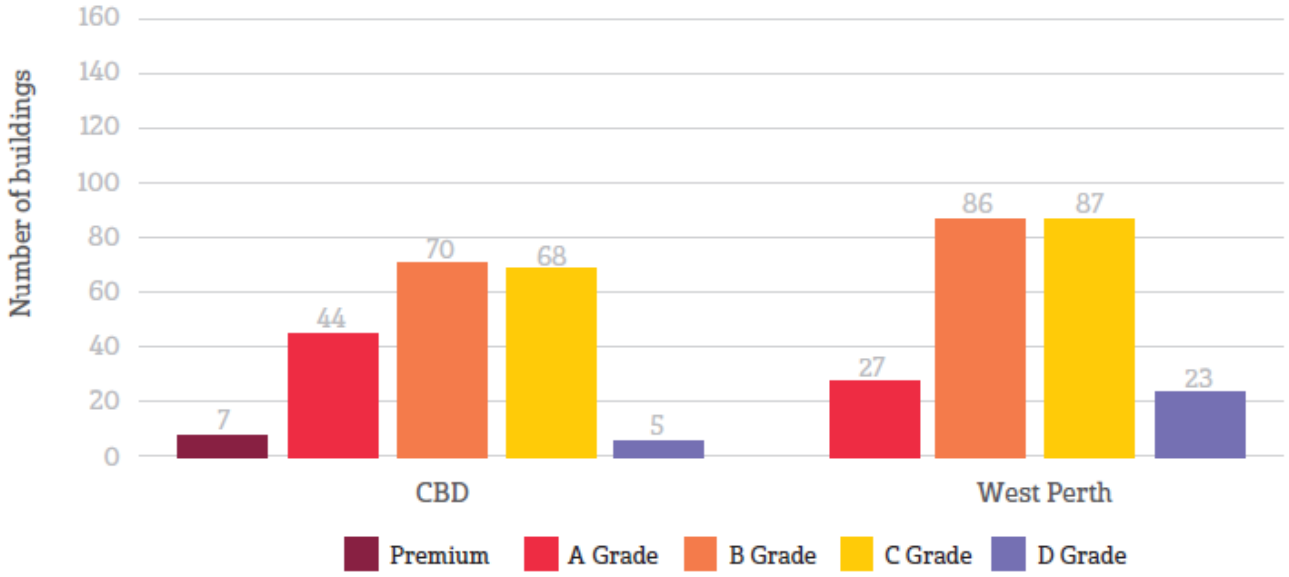
Of the 101 buildings that had a NABERS water rating (i.e. whole building and base building), most were rated between 1.5 to four stars (which equates to poor to good). The average rating was 3.4 stars, which is very close to the national average of 3.5.

The only minimum standards that are applicable to the environmentally sustainable design of buildings uniformly across WA are the National Construction Code requirements for building energy efficiency. These requirements relate to mechanical services, lighting, insulation and glazing. Compliance can be achieved through a deemed-to-satisfy process, verification using a reference building, or the Nationwide House Energy Rating Scheme (NatHERS). These requirements are currently being reviewed to improve outcomes.

Office grades

The Property Council of Australia (PCA) gathers data on the grades of office buildings in the CBD and West Perth. The boundaries used by the PCA for the CBD closely align with the boundaries of the Central Perth and East Perth neighbourhoods, while for West Perth they closely align with the boundaries of the West Perth neighbourhood. The data provides an indication of the quality of a large proportion of the non-residential buildings in these neighbourhoods (refer **Figure 50**). Most of the office buildings in these neighbourhoods are B and C grade.

Figure 50 - Perth city office grades (City of Perth, 2016[a])



It is likely that the C and D grade office buildings are making a significant contribution to the Perth city's carbon emissions – noting that commercial buildings are responsible for 57% of city's emissions – with the greatest emissions likely to be coming from the lower grade buildings.

The City has advocated for changes to the *Local Government Act, 1995* to enable agreements between local governments, building owners and financiers to fund projects that deliver environmental performance improvements in buildings. These agreements are known as Building Upgrade Finance and are utilised in Victoria, New South Wales and South Australia. If enabled here, the upgrades will not only lead to improved environmental performance, but also numerous other benefits – including greater utilisation of aging building stock.

Building frontages

The most recent assessment on building frontage quality was undertaken in 2017 as part of an internal baseline study commissioned by the City. The assessment of frontage activation was based on the approach established by Gehl Architects and used in the Perth 2009: Public Spaces and Public Life report. It used frequency of tenancies, diversity of function, transparency of facades, level of articulation, materials and detailing to determine if building frontages were scored as either 'good', 'somewhat-in-between good and poor' or 'poor' (refer to **Figure 51**).

The audit found that:

- Within each neighbourhood the frontage activation score varied considerably;
- Activation scores along key retail and entertainment/hospitality streets were universally high – e.g. Hay Street Mall, Murray street (west of Cathedral Square), William Street, James Street and Barrack;
- Arterial roads, service lanes and heavily trafficked areas universally received low frontage activation scores;
- The Central Perth city neighbourhood had the highest frontage activation score; and
- The activity centres in Crawley and Nedlands scored well, while the other streets received a very low frontage activation score (which is to be expected given their residential nature)

Figure 51 - Level of frontage activation

Character areas

There are areas within each neighbourhood with a unique built form and streetscape character that helps to create a sense of place and identity. These areas have a prevalent street and lot pattern, built form and/or landscaping that deliver a distinctive and attractive character. These character areas are not heritage areas, although some may have heritage places and areas located within them. Rather, they areas which provide important character value that should be recognised, reinforced and enhanced in future development.

A Built Form Character Study conducted by Hames Sharley defined Perth city's most important character areas and their key elements. Building on the results of this study, 14-character areas have been defined (Hames Sharley, 2020). Each character area is described in the 'neighbourhood profiles and analysis' section of this document and illustrated in the Neighbourhoods section of Part 1.

Residential Development

The State Government's R-Codes provide design guidance for residential development across the State and are applied through local government planning schemes. The R-Codes have primarily suited a suburban context where development is predominantly residential and therefore only had limited application in Perth city. Currently, the R-Codes apply only to land that has been designated a residential density code. These areas are illustrated in **Figure 52**.

Figure 52 - City of Perth R-coded areas

For all other areas of Perth city which are not assigned a residential density code, design guidance for residential development is provided by the City's Local Planning Policies including the Residential Development Policies.

1.5.1.3. Heritage

Heritage and culture help to create a sense of place and identity, they are an essential ingredient of what makes an area unique, they have a positive influence on community life and they contribute to the local economy and tourism. Perth city's diverse people, places and built form have greatly shaped its cultural landscape. These factors play an important role in a city's development – its economic growth, environmental sustainability, social unity and harmony, human freedoms and political stability (UNESCO, 1995).

Traditional ownership

Perth city is in the ancient country of the Nyoongar people, who have been the traditional custodians of the south west of Western Australia for at least 45,000 years (South West Aboriginal Land and Sea Council, 2016). The natural environment that is vital to Nyoongar culture, and traditionally the source of food and water, has been greatly changed by the development of Perth city over the last 200 years.

At the time of European settlement in 1829, areas surrounding what is now Central Perth city were known as Mooro, Beeloo and Beeliar (refer to **Figure 53**). The Whadjuk Nyoongar, as the traditional owners of these lands, had established a rich culture in these places (Western Australian Planning Commission, 2013).

Figure 53 - The original landscape and Whadjuk Nyoongar place names (City of Perth, 2016[a])

A key component of the South West Native Title Settlement is the *Noongar (Koorah, Nitja, Boordahwan) (Past, Present, Future) Recognition Act, 2016* which commenced on WA Day (6 June) 2016. The Act formally recognises the Nyoongar people as Traditional Owners of the south-west of Western Australia, as well as (Department of Premier and Cabinet, 2016):

- The living cultural, spiritual, familial and social relationship that the Nyoongar people have with the Nyoongar lands; and
- The significant and unique contribution that the Nyoongar people have made, are making, and will continue to make, to the heritage, cultural identity, community and economy of the state.

Recognising, understanding and valuing Nyoongar history and its modern-day culture is at the heart of the South West Native Settlement and the City's Reconciliation Action Plan.

> 'The City of Perth is Whadjuk boodjar (country). The lines between boodjar, moort (families) and Kaitij (knowledge) cannot be untied, dissolved or squashed by buildings, infill and freeways. These lines are the legacy of the Whadjuk Nyoongar. The Whadjuk own them. Boodjar, moort and katitjin define ownership, connect resources and families, tell how to manage country and keep it healthy, and are the law. Boodjar linked to moort and katitjin is more productive, more useful, more shared. It has been this way for thousands of years.'
>
> - Dr Tod Jones and Len Collard in "This City is Whadjuk Country"

Aboriginal heritage sites

Aboriginal heritage sites in the city are required under the *Aboriginal Heritage Act* 1972 to be given due regard in local development assessment, planning schemes and planning strategies. This Act will soon be updated with new legislation that is more culturally appropriate and equitable.

In accordance with the City's Reconciliation Action Plan, the City is working with the Whadjuk Nyoongar community to inform heritage management in the city and a potential future Cultural Heritage Management Plan.

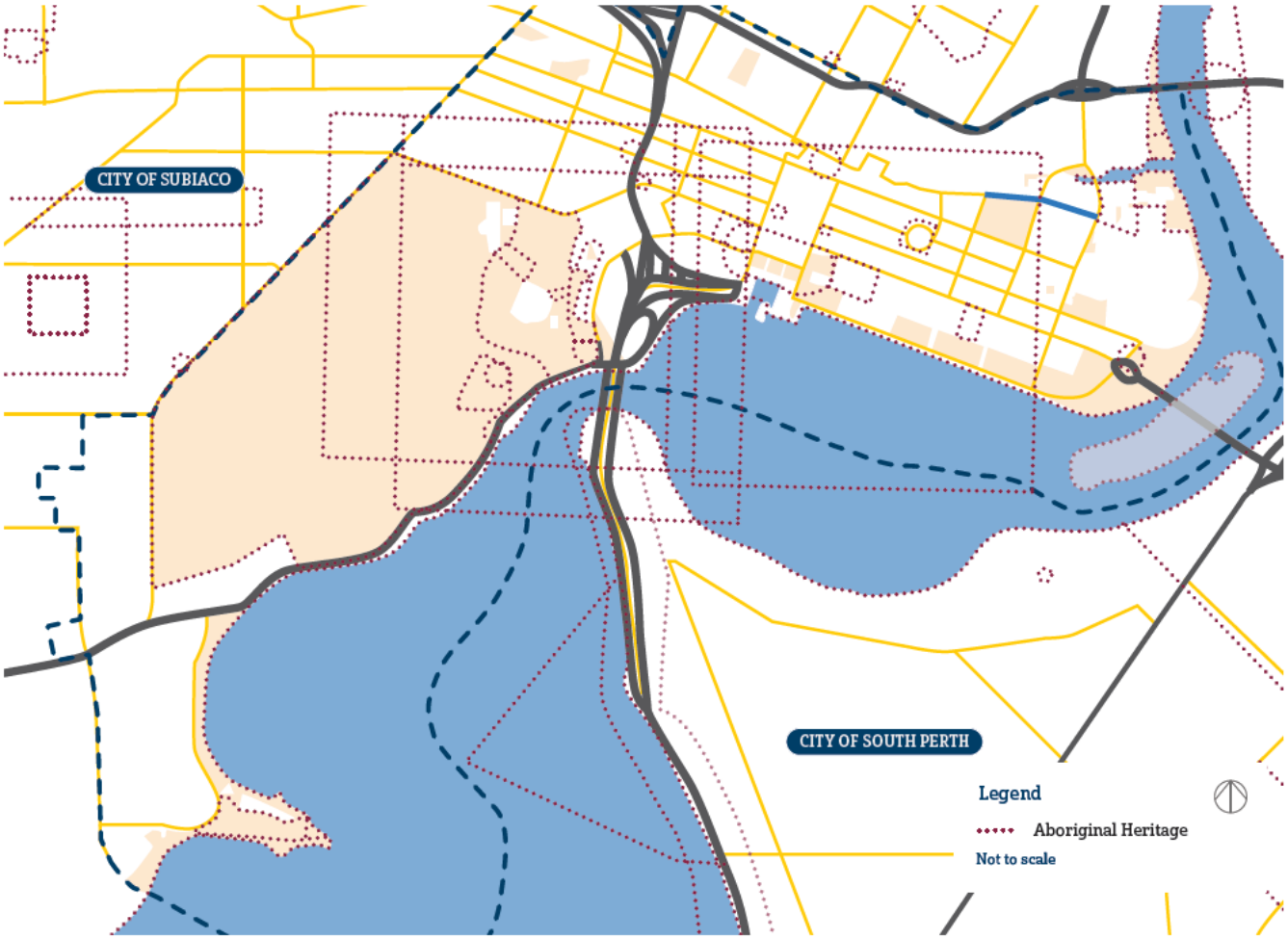
The City is guided by the advice from Department of Planning, Lands and Heritage when complying with the *Aboriginal Heritage Act 1972* requirements. Where non-statutory opportunities arise to support interpretation and presentation of Aboriginal heritage, the National Trust Guidelines for Interpretation of Aboriginal Heritage 2012 (WA) provides initial guidance for both the City and other organisations (National Trust, 2012).

As at April 2020, 18 sites within the City's boundary were registered in accordance with the *Aboriginal Heritage Act 1972* (refer to **Table 41** and **Figure 54**) (Department of Planning, Lands and Heritage, 2018). These are places of cultural and spiritual importance that link the past and the present – places where Whadjuk Nyoongar people met, camped, hunted and performed ceremonies.

Table 41 - Registered Aboriginal sites within Perth city

Location	Site ID	Type
Kings Park Scarred Tree	3502	Modified tree
Swan River	3536	Mythological
Heirisson Island	3589	Mythological, camp, hunting place, meeting place, plant resource
Gudinup	3593	Ceremonial
Claisebrook Camp	3694	Camp, water source
Spring Street	3703	Camp, named place, water source
Kings Park Waugal	3704	Ceremonial, mythological, plant resource, water source
Mt Eliza Waugal	3754	Mythological
Kings Park	3761	Ceremonial, hunting place
East Perth Power Station	3767	Camp, meeting place, other
Mounts Bay Road	3787	Mythological, camp, named place, water source
Perth Town Hall	3789	Camp
Matilda Bay	3791	Ceremonial, camp, water source
Government House	3798	Skeletal material/burial, camp, water source
Victoria Square	3799	Skeletal material/burial
Kilang Minangaldjkba	21621	Water source
Midegegooroo's Execution and Burial	29278	Historical, skeletal material/burial
Wellington Square, the Old Recreation Reserve, Bunjie Park	37452	Historical, man-made structure, rockshelter, meeting place

Figure 54 - Spatial representation of registered Aboriginal sites within the Perth city



Built heritage

Heritage places bring character and diversity to a city's built form and its streetscapes. Perth city's heritage places are protected through a range of mechanisms, including:

- The provisions of State Planning Policy 3.5 – Historic Heritage Conservation;
- The State Register of Heritage Places, established under the *Heritage Act 2018* and supported by the State Development Assessment Framework;
- The CPS2 heritage list and heritage areas, and the City of Subiaco Town Planning Scheme No. 4 (Subiaco Scheme No. 4) heritage list – all established under the deemed provisions of the Planning and Development (Local Planning Schemes) Regulations 2015; and
- Metropolitan Redevelopment Authority redevelopment area heritage inventories.

As at March 2021, Perth city has:

- 333 heritage places on the CPS2 heritage list. This will increase to 369 following the gazettal of Amendment No. 46 to CPS2 and the subsequent normalisation of several DevWA redevelopment areas.
- 5 State Heritage Precincts:
    - Old Swan Brewery Precinct.
    - Central Government Offices & Town Hall Precinct.
    - Aberdeen Street Precinct.
    - William & Wellington Street Precinct.
    - Royal Perth Hospital Heritage Precinct.

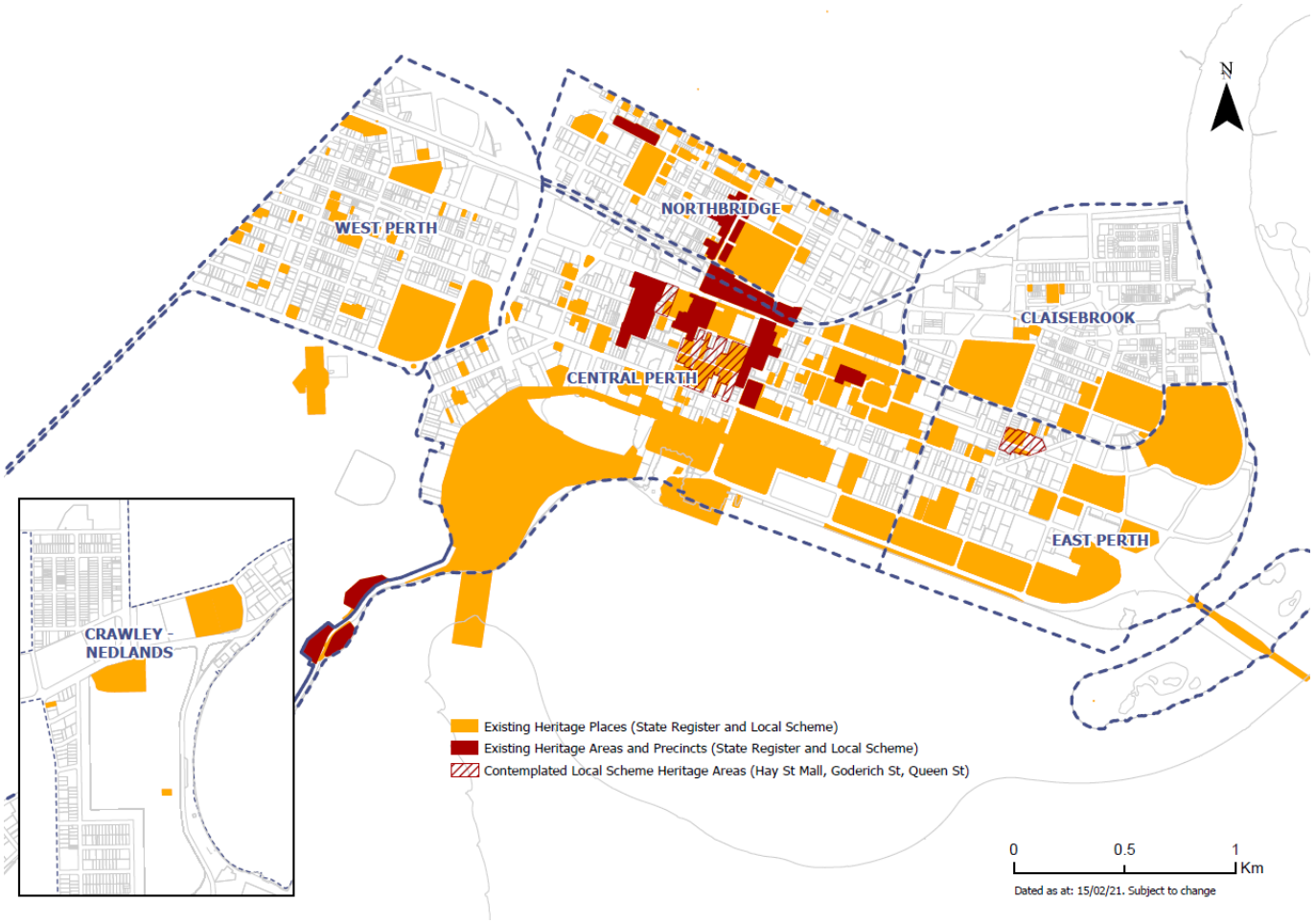
  The following additional State Heritage Precincts will be added following the normalisation of those DevWA redevelopment areas:

- William Street Precinct (William Street Precinct (East Side).
- Perth Railway Precinct (Perth Railway Station, Perth Train Station).

- 3 local heritage areas:
  - William Street Heritage Area.
  - Barrack Street Heritage Area.
  - King Street Heritage Area.

Inclusion on the City's heritage list, or the State Heritage Register, ensures they have statutory protection for their preservation and conservation. The indicative locations of these places are illustrated in Figure 55**.**

Figure 55 - Location of registered cultural heritage places in 2018



At the time of writing, three additional heritage areas are being considered for potential listing under CPS2 – Queen Street, Hay Street Mall and sections of Goderich Street.

While from time to time the City adds places and areas to its heritage list, it is acknowledged there are more that warrant assessment for inclusion. The City is reviewing its Local Heritage Survey and will seek to ensure all places and areas of appropriate cultural heritage significance are included on the Heritage List in the new scheme in order to safeguard their statutory protection.

The City's current local planning scheme (CPS2) also provides plot ratio incentives for the conservation, enhancement and ongoing maintenance of heritage places. This is achieved through the following two mechanisms:

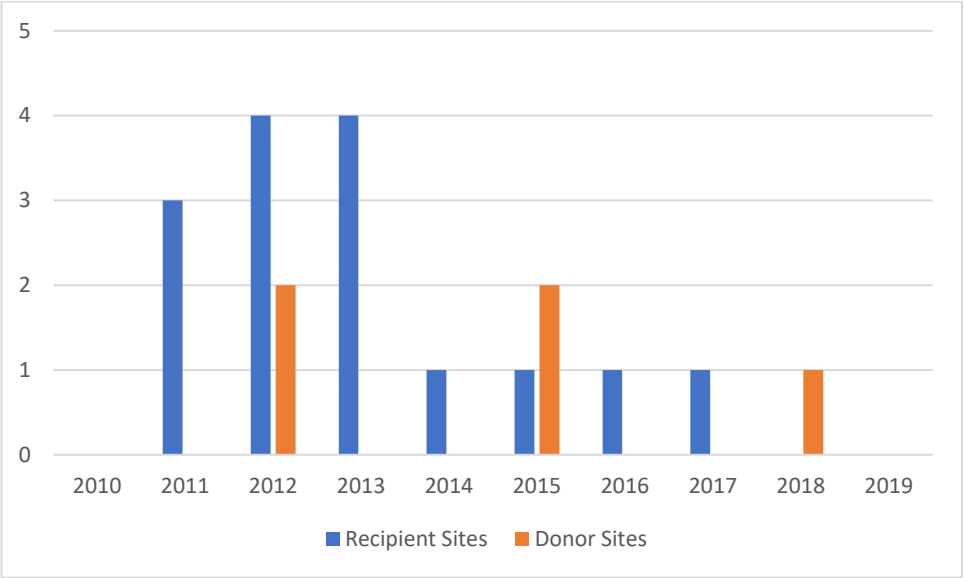
- Bonus Plot Ratio – a maximum 20% plot ratio bonus above the maximum specified under CPS2 may be awarded where a development conserves and enhances a heritage place or area; and
- Transfer Plot Ratio – transferring a portion of unused plot ratio from a heritage place or area (donor site) to a receiving development (recipient site). Any transferred plot ratio must be purchased by the recipient.

These have been utilised to deliver numerous retention and adaptation development projects within Perth city, such as Brookfield Place and the State Buildings.

A five-year review of development applications in Perth city between July 2014 – 2019 revealed that a total of 9 applications sought bonus plot ratio for heritage conservation. This represents 24% of all bonus plot ratio applications received during this period, and on average, 17% bonus plot ratio was sought.

Between 2010 and 2019, the City has approved 5 donor sites and 15 recipient sites for Transfer Plot Ratio transactions. Although no clear trends were observed, it appears that the uptake of Transfer Plot Ratio generally declined over the latter part of the decade as illustrated **Figure 56**.

Figure 56 - Transfer Plot Ratio Take-Up 2010 - 2019



The decline in uptake of transfer plot ratio was likely influenced by the broad increases in maximum 'base' plot ratio across the city, introduced through Amendment No. 25 to CPS2 in 2013. Increasing the amount of 'base' plot ratio available will logically devalue bonus mechanisms as fewer developments will require additional plot ratio to meet their needs.

Natural and intangible heritage

Several trees and city parks are listed on the City's Local Heritage List (under CPS2) including Stirling Gardens, Supreme Court Gardens, Langley Park, Queens Park and Harold Boas Gardens. The City also keeps a Significant Tree Register (for what were previously City of Subiaco areas).

Kings Park (Mooro Katta or Kaarta Gar-up) and the Swan River (Derbarl Yerrigan) are two places within the city that are culturally significant from both a Whadjuk Nyoongar and post-colonial perspective. The Whadjuk Nyoongar people have visited and used Mooro Katta or Kaarta Gar-up, two of the many names for Mount Eliza, for thousands of years for camping, hunting and ceremonies. It is also the site of the State War Memorial, which is visited by more than 40,000 people each Anzac Day Dawn Service in remembrance of the ANZAC soldiers who died in World War One. As such, it has cultural significance to many people.

1.6. Transport and infrastructure

1.6.1. Existing profile and trends

An efficient and sustainable movement system is not only integral to the economic, social and environmental prosperity of Perth city, but also to Greater Perth, due to the large concentration of jobs, services, facilities, education and social and cultural activities in the city.

There are various authorities in control of the city's transport network, including:

- City of Perth;
- Department of Transport;
- Main Roads WA; and
- Department of Planning, Lands and Heritage.

The Perth Greater CBD Transport Plan (being prepared by the Department of Transport) and the Integrated Transport Strategy (being prepared by the City) are the two primary documents coordinating the delivery of transport infrastructure within the City.

1.6.1.1. Parking

The control of car parking standards is divided between the City and the State Government. Residential car parking requirements are set by the City, while non-residential car parking requirements are set by the Department of Transport through the Perth Parking Policy.

The City's Parking Policy sets out minimum and maximum car-parking standards for residential development across the majority of Perth city, with the exception of Crawley-Nedlands. In Central Perth, there is no minimum requirement for car parking bays, and a maximum of 1.5 bays per dwelling is permitted. Elsewhere – including areas of West Perth and East Perth – a minimum standard of one bay per dwelling and a maximum of two bays per dwelling is permitted. In some small areas of the city – such as Terrace Road and parts of East Perth and Crawley – residential car parking must comply with the standards set out under the R-Codes.

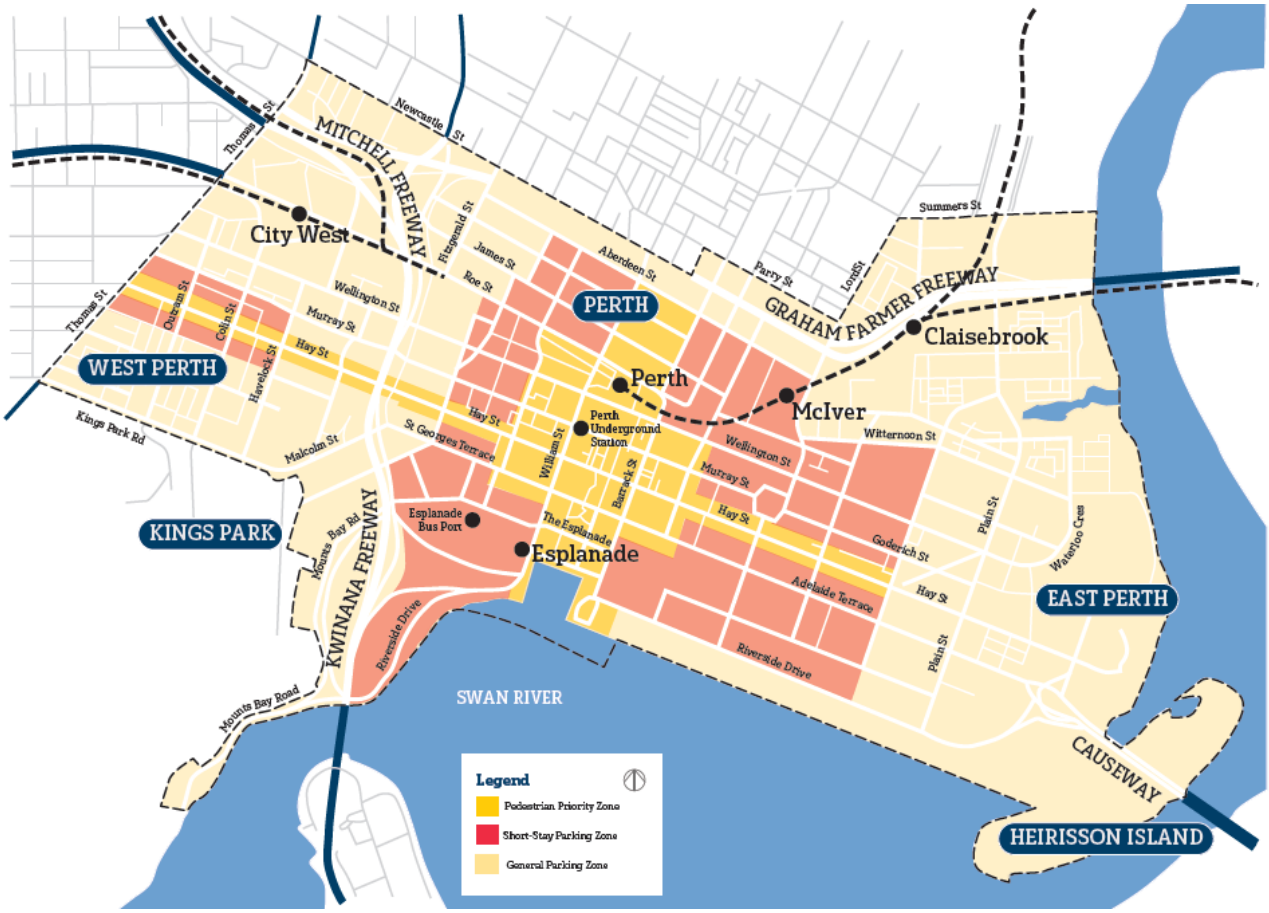
Perth city is located within the Perth Parking Management Area (PPMA), where all non-residential parking bays must be licensed by the Department of Transport. Annual license fees, known as the Perth Parking Levy, are collected by the Department of Transport to improve alternative means of transport to and from central Perth. There are approximately 52,000 such bays within the PPMA. This includes approximately 15,000 short-stay and on-street bays, 9,000 long stay bays and 28,000 tenant bays.

The provision of car parking within Perth city is complex and affects multiple stakeholders and governing agencies. Further discussion on the way parking affects future planning decisions is included in the Built Environment section.

The Department of Transport's Perth Parking Policy (2014) identifies Public Parking Zones and a Tenant Parking Hierarchy, which apply to non-resident parking in the city. There are three sub-zones under the Public Parking Zones:

- Pedestrian Priority Zone (PPZ) – only allows new public short-stay parking that does not require access from the streets within the PPZ;
- Short Stay Parking Zone (SPZ) – generally allows new public short-stay facilities; and
- General Parking Zone (GPZ) – allows both short and long-stay public parking.

Figure 57 - Perth Parking Policy Public Parking Zones and a Tenant Parking Hierarchy



The Tenant Parking Street Hierarchy establishes a ranking system to identify areas that prioritise public transport or pedestrians above the provision of car parking. This hierarchy is directly linked to the control of parking provisions across the city.

Figure 58 - Perth Parking Policy Tenant Parking Street Hierarchy

The Perth Parking Policy sets a maximum permitted number of commercial parking bays per 10,000sqm of lot area. Four standards apply, depending on the location, with the lowest permitted parking levels being in the centre of the city and Northbridge.

The two major providers of off-street public car parking facilities in Perth city are City of Perth Parking and Wilson Parking, offering approximately 8,700 car bays between them. The highest concentration of public car parks is in West Perth, Central Perth and Northbridge.

1.6.1.2. Public transport

Public transport is vital to the effective function of Perth city and the Greater Perth area. The city is serviced by a range of TransPerth bus and rail routes, a free CAT bus service and an increasingly popular ferry service across the Swan River.

The majority of Perth city's workforce (97%) live outside of the Perth city area (REMPLAN, 2016) – many of whom rely on public transport to get to and from work. The long-term trend shows a growing acceptance of public transport. Between 2018-2019, public transport use across the Perth metropolitan region increased by 1.1%, however usage declined substantially (-17.6%) in 2019-2020 due to Covid-19 restrictions) (Public Transport Authority, 2020).

Currently, over 50% of all public transport peak-hour trips across Greater Perth are to Perth city. Despite a decline over the past decade, the Department of Transport forecasts an increase in the use of public transport as Greater Perth's population grows towards 3.5 million people. According to the Department of Transport, around 65% of peak-hour trips to the Perth CBD, and over 70% of work trips to the wider business district (including West Perth, East Perth and Northbridge) will be taken by public transport by 2050 (Department of Transport, 2011). Currently, bus services to Central Perth are carrying up to 70% of road commuters. However, this accounts for just 5-10% of

the total number of vehicles on the road.

The CAT bus system comprises of four routes, joining East Perth, Central Perth, West Perth and Northbridge. Busses run at least every 15 minutes. The Red and Yellow CAT busses, which have East-West routes, operate from around 6am on weekdays (8.30am on weekends) until the early evening. The Blue CAT bus, with a North-South route between Elizabeth Quay and Northbridge, operates until around midnight on Fridays and Saturdays. The Green CAT bus is a key route for city workers, travelling between West Leederville and Elizabeth Quay, Monday to Friday (it does not operate on the weekends).

1.6.1.3. Roads

Three major roads cross the city, including the Graham Farmer Freeway, the Mitchell Freeway and Albany Highway over the Causeway. All three are classified as Primary Regional Roads under the Metropolitan Region Scheme (MRS). Several other Regional Roads are also designated under the scheme – and include Thomas Street, Hay Street (west), part of Fitzgerald Street, Kings Park Road and Riverside Drive. St Georges Terrace, Adelaide Terrace, Hay Street, Murray Street and Wellington Street are the main local traffic distributors, allowing for east-west movement through the city.

Data capturing the average number of vehicles entering and exiting Perth city during the week indicates an overall decline in the vehicle activity in both the inner and outer cordons from 2013-2015 (City of Perth, 2015). A relatively higher level of activity was recorded in the outer cordon. The reduced number of vehicle activity may signify the downturn of the WA economy and business activity at this time, with the increased traffic in the outer cordon, signifying regional vehicles drive around Central Perth rather than through it.

While the above data provides a picture of the extent of vehicle activity in Perth city, there is currently no data indicating the purpose of these trips i.e., for work, accessing goods and services, delivering goods or visiting residents.

1.6.1.4. Two-way streets

Existing one-way streets in Perth city are being converted to two-way streets, as part of a program to make the street network more user-friendly to pedestrians, cyclists and users of on-demand and public transport. The conversion of Hay Street and Murray Street to two-way will greatly help in achieving a more integrated transport system in an east-west direction.

1.6.1.5. Car ownership

There is a relatively low level of vehicle ownership among residents of Perth city when compared to Greater Perth – with 64.3% of households owning one or more private motor vehicles, compared to 84% of households in Greater Perth. There are also a much higher number of Perth city households that do not own a car – 18.4%, compared to 4.7% in Greater Perth (refer to **Table 42**).

Despite this relatively lower level of car ownership in Perth city, there is no indication that vehicle ownership will reduce over time. In fact, between 2006 and 2016 there was an 8.0% increase in households with one motor vehicle (although this may be due to a reduction in the 'not stated' responses over this time).

Table 42 - Number of motor vehicles per household

Number of motor vehicles per household (enumerated)	2006	2011	2016	Change from 2006-2016
None	19.3%	21.5%	18.4%	- 0.9%
1 motor vehicle	38.3%	44.2%	46.3%	8.0%
2 motor vehicles	15.5%	15.4%	15.1%	- 0.4%
3 or more motor vehicles	3.3%	2.7%	2.9%	- 0.4%
Not stated	23.5%	16.3%	17.4%	- 6.1%

Among Perth city residents, driving a car remains the most common means of getting to work, with around a third of all residents commuting this way (refer to **Table 43**). However, trends indicate that there has been some shift over time from private vehicle use to public transport, with around a quarter (25%) of residents commuting by public transport in 2016, compared to around one in six (16%) in 2006.

Active transport, such as walking or cycling is far more common among Perth city residents than in Greater Perth. Over 20% of the city's employed residential population chose to walk to their place of work in 2016, compared to 2.1% of Greater Perth residents.

Table 43 - Method of travel to work from place of residence in the Perth city (Australian Bureau of Statistics, 2006-2016)

Method of travel	2006	2011	2016	Change from 2006-16
Car driver	36.1%	33.1%	32.8%	-3.3%
Walked only	21.2%	22.5%	20.6%	-0.6%
Bus	13.4%	17.2%	18.9%	5.5%
Train	3.0%	5.4%	5.8%	2.8%
Cycled	1.3%	2.3%	1.9%	0.6%

Worked at home	4.7%	3.1%	3.6%	-1.1%

It should be noted that statistics from the 2006 and 2011 columns in the above table are based on the former City boundary.

1.6.1.6. Freight

The delivery of goods and services to and within Perth city is vital, however, freight deliveries are often competing for space on busy city streets. The City undertook the Last Kilometre Freight Study in 2016, which investigated the changing needs, challenges and demands of the last kilometre freight task in Perth city. However, there is limited data available on the number of vehicle trips relating to servicing and delivery, or their route and movement networks.

1.6.1.7. Pedestrians

Walking and other pedestrian activity will remain the priority form of transport in Perth city. An integrated movement network creates an effective way to travel between key city landmarks, commercial precincts, residential areas and regional public transport. Design and infrastructure can significantly influence the extent to which people choose to walk.

The City is improving the pedestrian environment through a series of public realm improvements. Pedestrians are also impacted when other modes of transport are prioritised. For example, where cars are given priority at intersections, pedestrians often face delays, which diminishes the quality of the pedestrian environment. Ensuring that stakeholders share the City's ambitions for walkability is critical, so we can work on improving the pedestrian culture in Perth city.

Recent pedestrian surveys indicate a drop in pedestrian numbers since similar surveys were undertaken in 2008 and 2009. A total of 239,434 pedestrians were recorded in 2017, which includes the collection of data across all Perth city neighbourhoods. This is a 10% decrease since 2008-09, where a total of 264,832 pedestrians were counted (Intermethod, 2018). The locations experiencing the highest levels of pedestrian activity across Perth city can be seen in **Table 44.**

Table 44 - Areas with the highest levels of pedestrian activity (Intermethod, 2018)

Daytime Pedestrian Flow	Evening and Night Time Pedestrian Flow
Murray St Mall (between Forrest Pl and Barrack St)	William St (between Murray St Mall and Hay St Mall)
William St (between Murray St Mall and Hay St Mall)	James St (between Mountain Tce and Parker St)
Hay St Mall	Barrack St (between Murray St Mall and Hay St Mall)
St Georges Tce (between William St and Sherwood Ct)	Murray St Mall (between Forrest Pl and Barrack St)
St Georges Tce (between Mercantile Ln and William St)	William St (between Francis St and James St)

Comparing studies undertaken in 2008-09 and in 2017, the greatest growth in pedestrian movement has happened on:

- William Street (between Murray St Mall and Hay St) – 16% growth;
- Lake Street (between Francis St and James St) – 6.0% growth;
- James Street (between Mountain Tce and Parker St) – 6.0% growth; and
- St Georges Terrace (between Mercantile Ln and William St) – 4.0% growth.

The greatest decline in growth has occurred to the east of the City, in the following locations:

- Adelaide Terrace (between Victoria Ave and Hill St) – 35% decline;
- Hay Street (between Hill St and Bennett St) – 32% decline; and
- Hay Street (Barrack St to Pier St) – 30% decline.

1.6.1.8. Cyclists

According to the Department of Transport, the number of people cycling to work or for leisure has increased more than five times since the development of the Perth Bicycle Network in 1996. This is expected to increase in the coming years as the cycling network is further expanded. As at 2016, one in forty (2.5%) people who worked in the city commuted to work by bicycle (REMPLAN, 2016).

Central Perth is generally well connected by regional cycling routes that extend into the outer suburbs – primarily via Principal Shared Paths (PSPs) along the rail lines. These are well used by cycle commuters from the outer suburbs, with 11 fixed bicycle counters placed on the PSP network around the city centre. These counters recorded an average of 10,000 bicycle trips per weekday during 2015-16.

The City's Cycle Plan 2029 was endorsed by the council in 2012 and identified the planned cycle network for Perth city (**Figure 59**). This plan is currently being reviewed to ensure it remains the best method of directing cyclists throughout the city.

Figure 59 - City of Perth Cycle Plan 2029 - planned ultimate cycle network

End of trip facilities

There is no data recorded on the number of end of trip facilities throughout Perth city currently. However, the City undertook a review of its requirements for bicycle parking and end-of-trip facilities in 2018 (City of Perth, 2018[c]). The review compared the City's requirements for end of trip facilities to best practice examples throughout Australia (refer **Table 45**).

Table 45 - Comparison of end of trip facilities

Land Use	City of Perth	City of Sydney	Adelaide City	Brisbane City
Office – staff	1 per 500m^2 GFA	1 per 150m^2 GFA	1 per 200m^2 GFA	1 per 200m^2 GFA
Office – visitors	n/a	1 per 400m^2 GFA	2 plus 1 per 1,000m^2 GFA	1 per 500-750m^2 GFA
Retail – staff	1 per 500m^2 GFA	1 per 250m^2 GFA	1 per 300m^2 GFA	1 per 200m^2 GFA
Retail – visitors	n/a	2 plus 1 per 100m^2 over 100m^2 GFA	1 per 600m^2 GFA	1 per 200-500m^2 GFA
Apartment – residents	1 per 3 units	1 per dwelling	1-2 per dwelling	1 per unit
Apartment - visitors	n/a	1 per 10 dwellings	n/a	1 per 4 units

The review found the City's requirements for end-of-trip facilities were low comparative standards from other capital cities including Sydney, Adelaide and Brisbane. The City's rates were also found to be low in comparison to development case studies from Development WA and nearby local governments.

Overall, the City's current rates are not considered to meet commuter expectations or industry standards.

1.6.1.9. Utilities and services

Utility services are critical to the future growth of both commercial and residential development in Perth city. Most utility services are currently delivered via large-scale infrastructure networks that stretch across Greater Perth and the State. The Central Sub-regional Framework provides a long-term integrated planning framework for land use, infrastructure and states:

> 'The service capacity of existing infrastructure to accommodate the proportion of 3.5 million people who will live in the city in infill developments within the next 30-40 years has been taken into consideration and proposed infrastructure, primarily upgrades, [have] been identified … '

The State government developed the Infrastructure Coordination Framework (ICF), which is administered through the WAPC Infrastructure Coordinating Committee (ICC). The purpose of this framework is to ensure the strategic alignment of infrastructure coordination and delivery within Greater Perth as it continues to grow.

Generally, servicing-infrastructure and utilities within Perth city have the capacity to accommodate expected growth in the short-term. However, the pressure on servicing and utilities such as water, sewerage systems, electricity and telecommunications will continue to increase with Perth city's population.

The delivery of an efficient service-delivery structure will be critical in making sure the city can continue to attract and appropriately service its residents, businesses and tourists. A brief outline of the current state of individual utility-services in the city is outlined below.

Electricity

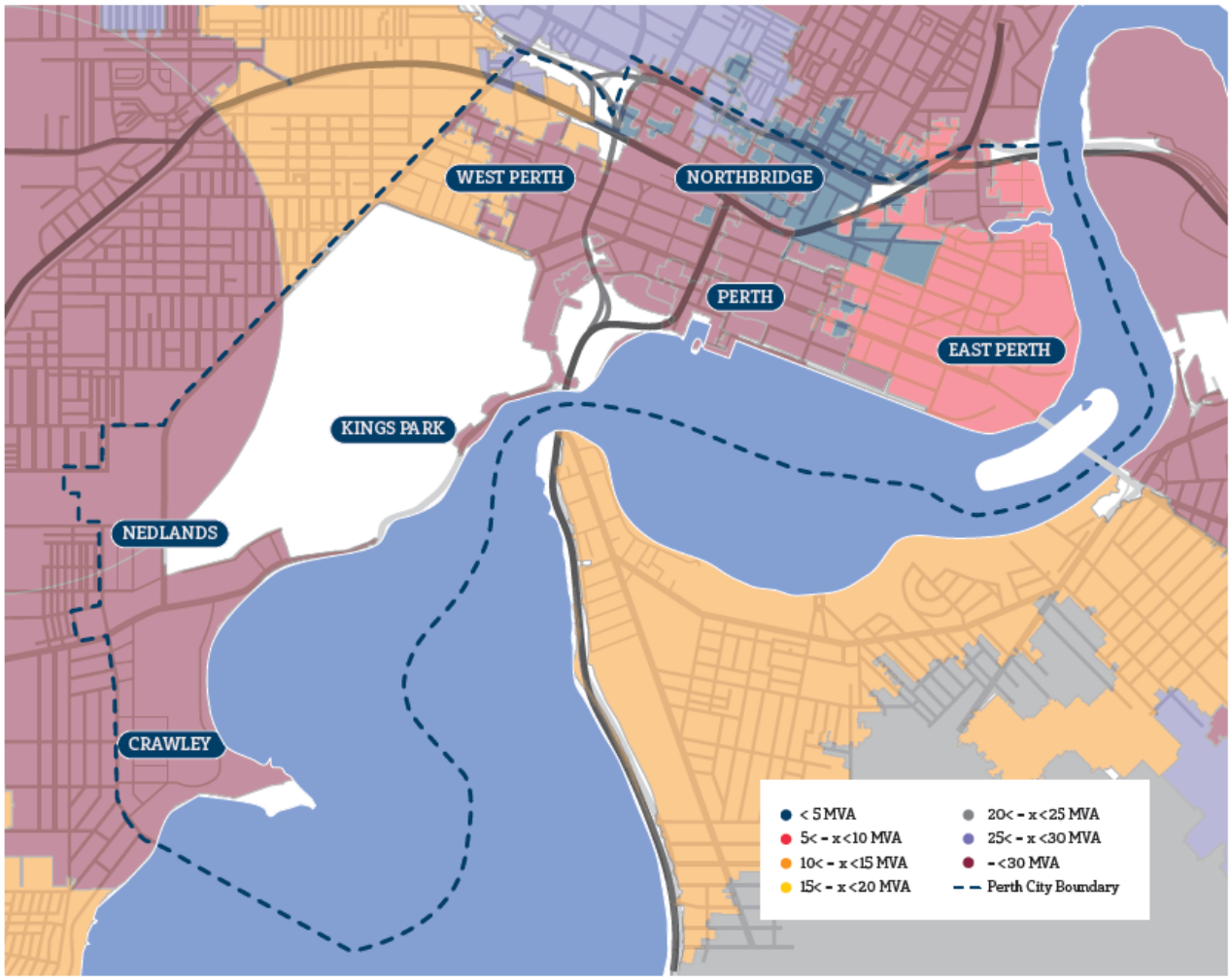
Electricity is provided throughout Perth city from Western Power's South West Interconnector System (SWIS). High voltage electricity is delivered to eight zone substations by overhead and underground cables. Electricity is then reticulated to each property through an underground cable network, generally located within the road reserves.

The central area of Perth city, including UWA and QEII have high levels of remaining capacity. However, the area around the McIver train station and part of Northbridge and Crawley have low levels of remaining capacity (refer to **Figure 60**). It should be noted that areas shown as having low levels of remaining capacity do not necessarily

represent an overall capacity constraint problem, as there is flexibility to transfer load-demand from a constrained zone substation to a nearby zone substation (if it has available capacity) (Western Power, 2016[a])

Western Power, in conjunction with the Department of Planning, Lands and Heritage is currently reviewing its Transmission Network Development Plan (TNDP) and Long-term Network Development Plans (LNDPs) to respond to forecast growth over the next 25 years (Western Power, 2016[b]).

Figure 60 - Forecast capacity to 2026 for electrical infrastructure (Western Power, 2018)



Natural gas

Natural gas is reticulated throughout Perth city via a network of high-pressure pipes (mains) that are located within the road reserves. These are managed by ATCO Gas.

Potable water

Potable water is supplied throughout Perth city by the Integrated Water Supply System (IWSS), which is owned and managed by the Water Corporation. The system sources raw water from a range of sources, which is then treated and distributed through trunk mains to local reservoirs and high-capacity storage tanks. From the storage reservoirs and tanks, water is delivered to individual properties through gravity pipes. Perth city is supplied with potable water from the Mt Isa Reservoir.

To support the needs of population growth and climate change to 2031 and beyond, the Water Corporation is developing new water source infrastructure to boost the capacity of the IWSS – and is working with residential and business consumers to reduce per capita water use.

Wastewater (sewerage)

The wastewater (sewerage) systems within Greater Perth are owned and managed by the Water Corporation.

These systems are a pipe network that transports sewerage from individual properties to a temporary holding storage and pump station. The pump stations then transfer the wastewater to a treatment plant, where it is treated and then discharged into the ocean. The Water Corporation is currently investing in systems to reduce ocean discharge by injecting the treated wastewater into the ground. Perth city is within the Subiaco Wastewater Treatment Plant (WWPT) catchment.

Wastewater inflows to Perth's treatment plants are projected to increase significantly by 2031. How much wastewater is collected and treated will depend on growth, as well as water use by homes and businesses (Western Australian Planning Commission, 2010). A range of works are being considered over the next few years to accommodate growth. It is recommended that the East Perth Distribution Main be extended in the meantime.

Stormwater drainage

The stormwater drainage system within Perth city is owned and managed by the city and/or the Water Corporation. The city's system provides for drainage from property, roads, footpaths and public open spaces through a series of pipes, which then discharge into the Swan River and the Claisebrook Main Drain.

The system is designed to Australian Rainfall and Runoff standards, and generally manages most rainfall conditions – with the exception of high river-tides (when the outfalls cannot discharge water quickly enough) and localised flooding that occurs along the Esplanade reserve. These events are generally short-term, and flooding clears when the river tides recede.

The Australian Rainfall and Runoff standard has been recently revised and the city is reviewing the impact of this on its infrastructure. The city limits the amount of discharge from properties and requires a minimum storage to be provided onsite (City of Perth, 2016).

Telecommunications

Telecommunications systems provide for voice and data communication via copper and fibre-optic cabling, which generally run within the road reserves. Perth city has separate cabling networks owned and managed by a range of providers. Currently, the older copper cables are being replaced by fibre-optic cables.

The city has separate areas currently serviced through the National Broadband Network (NBN), which provides a data network for high-speed phone and internet services.

The City operates a public WiFi service across Central Perth and Northbridge, which provides 24 hour continues access to the internet. Fibre-optic has expanded throughout East Perth, which will extend the City's CCTV capability and allow the public WiFi service to be expanded. Any further expansions of public WiFi will be undertaken in accordance with the City's Information Technology Strategy.

Decentralised systems

The majority of utility services are currently delivered via large-scale infrastructure networks that stretch across Greater Perth and the state. However, there are also existing and emerging technologies that enable some utility services to be generated and delivered via decentralised-systems at the neighbourhood level or at building level. These include district heating and cooling schemes, rainwater tanks and solar photovoltaic cells.

Waste

Waste is generated by businesses, facilities (like hospitals and stadiums), city visitors (who use public spaces and attend events), residents, and infrastructure and building construction, renewal and demolition. The generation of waste can have an impact on the natural environmental at local and regional level – including litter, possible contamination of land and water, the generation of greenhouse gas (methane) and energy consumption through collection, processing and disposal.

The City's Waste Strategy 2014-2024+ aims to *'be cognisant of and contribute to the achievement of State Government and waste management objectives in terms of quantitative and time-based targets,'* and work towards the State Government target to divert 65% of municipal solid waste from landfill by 2020 (City of Perth, 2014).

The City's future population growth, and subsequent waste collection, requires a flexible and innovative

approach. To do this, we need to provide options for recycling alongside education on how to minimise and reuse materials. The City experiences significant shifts in population throughout the day and night, which results in changing needs and demands. Having the ability to service all the different waste and recycling streams, no matter when or where it is produced, is an ongoing challenge.

Servicing and delivery

There are two public loading docks within Perth city, located at Forest Place (accessed via Wellington Street) and Enex100 (accessed via St Georges Terrace). For the most part, deliveries to businesses located in Forest Place and Murray Street Mall use the Forest Place dock. Businesses located in the Hay Street Mall and to a lesser extent, along St Georges Terrace use the Enex100 dock (Jacobs, 2017). There are also several buildings within the city that have their own private loading docks. Additionally, there are a number of public loading zones/bays that are shared by delivery vehicles, service vehicles and construction and tradespeople.

As the number of people living and working in the city increases, the potential for conflict and demand for space on the city's already-crowded street network will continue to grow. With this also comes an increased need for built infrastructure that caters to the needs of delivery services, including loading docks, loading zones and access to malls. Addressing amenity and liveability issues when planning for the last kilometre freight task in the city will therefore require compromise and balance.

Planned service infrastructure and extensions

The Central Sub-Regional Planning Framework identifies where development is likely to take place. This provides more certainty to infrastructure agencies in respect to forward planning and the allocation of funding and resources. The objective is to ensure the timely, efficient and cost-effective delivery of electricity, water, wastewater and other service infrastructure. The delivery of this infrastructure needs to be aligned with the anticipated staging of infill development.

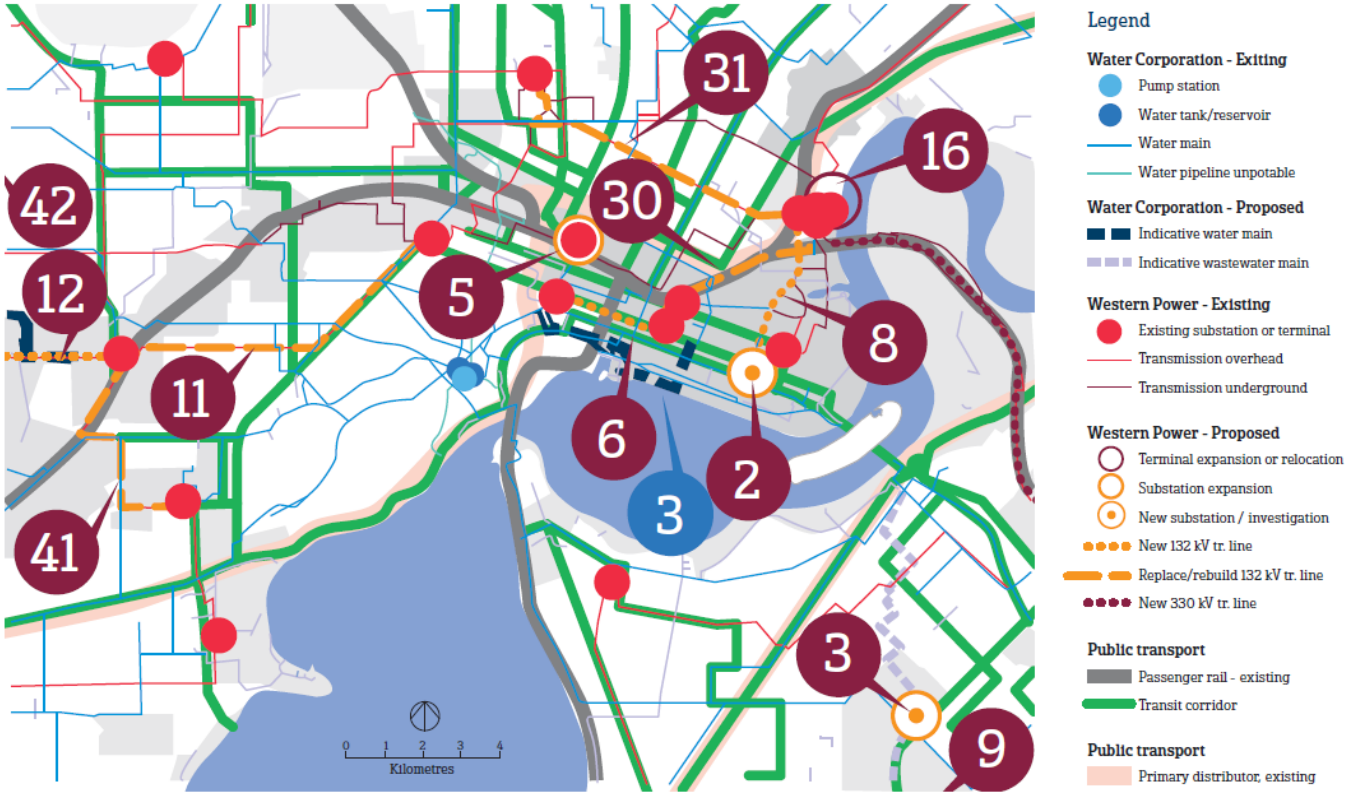
An excerpt from the Central Sub-Regional Planning Framework (refer **Figure 61**) identifies proposed servicing upgrades, extensions and new infrastructure required to ensure the Central sub-region is adequately serviced between now and 2050. Infrastructure requirements and staging, as it applies to Perth city, is outlined below:

- The Water Corporation's proposed water supply infrastructure includes the extension of the East Perth distribution mains, for delivery in the medium-term (2022-31).

New electricity infrastructure is required to meet the growing needs of Perth city. The following new electrical infrastructure is needed for Perth city:

- A new 132 Kilovolt (kV) infrastructure line along Hay Street to Milligan Street (currently proposed 2015-2021);
- A new 132kV substation in Central Perth, with new 132kV infrastructure line route between East Perth and Central Perth;
- A new 330kV terminal in East Perth and new 330kV infrastructure line route between Cannington and East Perth, is expected to be needed in the medium-term (2022-31);
- Upgrades to the 132kV infrastructure line routes between East Perth and Hay Street and East Perth and North Perth, will also be required in the medium-term; and
- A new sub-station is proposed in East Perth – with associated line routes linking these sub-stations into the network – and the existing substation in Northbridge is proposed to be expanded

Figure 61 - Perth & Peel @3.5m Infrastructure Staging



The need for these services, as well as the timing and the delivery will require further investigation through more detailed planning. As time goes by, it is expected that electricity infrastructure will be complemented by more innovative technologies – such as microgrids, embedded renewable energy generation and energy storage systems.

2. Glossary

2.1. Terms

Activity centres: focal points of commercial activity within Perth city. They comprise uses such as commercial, retail, higher-density housing, entertainment, tourism, civic-community, and day to day needs. Activity centres vary in size across Perth city and are designed to be well-serviced to public transport.

Adaptive reuse: the process that changes a disused or ineffective item into a new item that can be used for a different purpose. Sometimes, nothing changes but the item's use. This term is specifically used regarding the adaptive reuse of buildings (Department of Environment and Heritage, 2004).

Affordable housing: dwellings that households on low to-moderate incomes can afford, while meeting other essential living costs. Affordable housing includes public housing, not-for profit housing and other subsidised housing under the National Rental Affordability Scheme, together with private rental and home ownership options for those immediately outside the subsidised social housing system.

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

Amenity: factors that combine to form the character or sense of place of an area and include the present and likely future amenity.

Applicant: a person or company who applies for development approval.

Application (also 'development application'): documentation lodged for assessment with a relevant authority regarding a proposed development.

Built environment (also 'urban environment' and 'urban space/s'): human-made structures, features, and facilities viewed collectively as an environment in which people live and work.

Built form (also 'urban fabric' and 'urban form'): has the same meaning as set out in the City's Urban Design Framework, and refers to an element of urban design that: defines streets and urban spaces; sets the scale of streets, precincts and neighbourhoods; influences the way activities in buildings interact with the public domain; and, through overshadowing from structures, influences the way in which people use urban spaces at different times of the year.

Bush Forever: is a whole-of-government policy for the conservation of regionally significant bushland on the Swan Coastal Plain portion of the Perth Metropolitan Region.

Central Perth: the area within the Central Perth neighbourhood as defined by the Local Planning Strategy spatial plans.

Civic use: has the same definition contained under the Planning and Development (Local Planning Schemes) Regulations 2015, and means premises used by a government department, an instrumentality of the State or the local government for administrative, recreational or other purposes.

Cultural Heritage significance: has the same definition as the *Heritage Act 2018* and means aesthetic, historic, scientific, social or spiritual value for individual groups within Western Australia.

Cultural landscape: has the same meaning outlined by the World Heritage Committee and refers to cultural properties or elements within a landscape that represent the combined works of nature and people.

Desktop audit: a high-level review of policies and procedures.

Design Guidelines: design policy prepared under the City's planning scheme.

Diversification: The process by which an economy (i.e. a region) strives to increase the range of industries and outputs it holds, so that income can be derived from many different sources not directly related to each other. Diversification is fundamental in building economic resilience: the more diverse the industry portfolio, the less sensitive it will be to fluctuations in external drivers or markets; likewise, the greater the range of productive enterprises, the higher the likelihood that one of them will achieve above-average performance and become a competitive advantage.

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

Economic base: a business that generates employment in a community or a geographical area.

Emerging activity centres: a commercial area in a Perth city neighbourhood that has been identified under the Perth City Centres Analysis 2018 where an activity centre has begun to form but is not yet established. These centres may require additional planning provisions or specialised approaches to become a prosperous centre.

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

End-of- trip facilities (also 'end-of- journey facilities'): has the same definition as CPS2 Planning Policy 5.3 Bicycle Parking and End of Journey Facilities, and means the facilities which support the use of bicycle transport by allowing cyclists the opportunity to shower and change at the beginning or end of their journey to and from work.

Fine grain: refers to:

(a) analysis of something at a greater detail.
(b) an element of urban design that describes a streetscape's built form pattern that is characterised by aspects such as frequent entries to buildings, continuous shopfronts, awnings over the footpath and an emphasis on glazing.
(c) describes a built form pattern where street blocks and/or the subdivision of lots that are predominantly of a smaller scale. This built form pattern is considered to promote diversity in land uses and walkability within a neighbourhood.

Entertainment/Recreation/Cultural: Activities which provide entertainment, recreation and culture for the community and which occur in buildings and/or on land, such as passive and active sports venues, museums, amusements and gambling services.

Floor area: the same definition as provided in City Planning Scheme No. 2. Refers to the floor area of a building.

Floorplate: gross floor area of a level within a building.

Gazetted: a statutory or other notice required by law and/or Government authority that has been published in the Western Australian Government Gazette.

Government Gazette: the publication that contains formal public notices required to be published by law and Government authority, and includes the General and Special Gazettes.

Greater Perth: the Australian Bureau of Statistics Greater Capital City Statistical Area – Greater Perth. It includes the metropolitan areas of Perth and Peel.

Green infrastructure: the network of interconnected and multifunctional green spaces, elements, corridors, water systems such as surface and groundwater systems that are integrated within the city's urban fabric.

Green network (also 'green infrastructure network'): Perth city's public and private green spaces and their linkages. The green network includes Bush Forever sites, national and regional parks, district and local parks,

sports fields, school grounds, community facilities, golf courses, foreshores and riverfront areas connected by streetscapes, trails, cycle paths and pedestrian footpaths.

Health/Welfare/Community Services: Government, government-subsidised and non-government activities that provide the community with a specific service, including hospitals, schools, personal services and religious activities.

High frequency transit corridor: where public transport services are available at a high frequency, usually every five minutes during peak times and every 15 minutes outside of peak times.

Household composition: has the same definition as the Australian Institute of Health and Welfare and means the composition of the household based on the relationship between household members.

Housing continuum: a concept used by the WA State Affordable Housing Strategy 2010-2020 to describe the affordable housing system in Western Australia. It presents the range of housing options available to different households on a continuum with crisis accommodation (for people at risk of homelessness) at one end and unsubsidised home ownership at the other end.

Housing stock: the total number of dwellings within a geographical area.

Industrial: land zoned for industrial use under the Metropolitan Region Scheme to provide for manufacturing industry and the storage and distribution of goods and associated uses.

Infill (also 'urban infill' or 'infill development'): the redevelopment of existing urban areas at a higher density than currently exists.

Inner-city: refers to Perth city and neighbouring localities.

Integrated transport planning: a 'vertical' and 'horizontal' approach to managing a movement network. The 'vertical' element acknowledges the needs and influences each tier of government has on a movement network, and the collaboration required to ensure a functional and dynamic movement network that supports prosperous communities. The 'horizontal' element considers key transport issues such as transport system interdependencies, interactions between transport and land use, transport safety, traffic congestion, parking, travel demand management and accessibility that influence the planning and provision of sustainable transport systems (WAPC, 2012 and City of Perth 2016[d]).

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

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

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

Labour force: the total number of local residents who are participating in the labour force and considers people employed plus those seeking work.

Land-use planning: the process of regulating and managing the use of land by government in an efficient and ethical way, to prevent land-use conflicts and plan for the needs of the community.

Last kilometre freight: a term used to refer to the final leg of the journey of goods and services from a depot to the destination for consumption.

Liveable (also 'Liveability'): encompasses the many characteristics that make a place desirable for people to live. Liveability means a community which is *'safe, attractive, socially cohesive and inclusive, and environmentally sustainable; with affordable and diverse housing linked by convenient public transport, walking and cycling infrastructure to employment, education, public open space, local shops, health and community services, and*

leisure and cultural opportunities."[6]

Live-local (also 'live-locally' and 'living locally'): the ability for residents within a neighbourhood to access essential services such as grocery shops, medical services, childcare and education facilities, along with green space, community facilities and areas of high amenity, within a pedestrian dominated walkable catchment (Barton, Grant, Guise, 2010).

Live-local services: essential services such as grocery shops and medical facilities that are available to residents within a walkable catchment of their city neighbourhood.

Local planning strategy: local-level planning frameworks adopted by local governments across WA to provide strategic direction for land use and development within a municipal area. A local planning strategy is used to guide or inform the content of statutory city or local planning schemes.

Local planning scheme: are detailed planning schemes developed by local governments to manage the range of permitted land uses within specified locations. For localities covered by the Metropolitan Region Scheme, the Peel Region Scheme or the Greater Bunbury Region Scheme, local planning schemes must be consistent with the provisions identified within the relevant region scheme.

Model scheme text: the format and wording that all local planning schemes are required to follow, as set out under Schedule 1 – Model provisions for local planning schemes of the Planning and Development (Local Planning Schemes) Regulations 2015.

Native Title: the recognition by Australian law of Aboriginal and Torres Strait Islander people's traditional rights and interests in land and waters held under traditional law and custom.

Net lettable area (also 'floorspace'): has the same definition as the Planning and Development (Local Planning Schemes) Regulations 2015, and means the area of all floors within the internal finished surfaces of permanent walls but does not include the following areas —

(a) stairs, toilets, cleaner's cupboards, lift shafts and motor rooms, escalators, tea rooms and plant rooms, and other service areas;
(b) lobbies between lifts facing other lifts serving the same floor;
(c) areas set aside as public space or thoroughfares and not for the exclusive use of occupiers of the floor or building;
(d) areas set aside for the provision of facilities or services to the floor or building where those facilities are not for the exclusive use of occupiers of the floor or building.

Node: refers to-

(a) a focal point of increased activity within a neighbourhood. An activity node can refer to focal points for specific activities such as: retail, service or other commercial activities; community facilities; or mass transit and public transport connections.
(b) an area designated within public open space for increased activation or linkages.
(c) assets within the city's green infrastructure network that are defined by their primary 'benefit' (community health and wellbeing, energy resilience, water sensitivity, biodiversity, waste management or climate adaptation) and are physically connected by green links or green corridors.

Noise attenuation: the process of reducing the impact of noise generated from either within or externally to a room or entire building. This can be done through the installation of materials such as insulation that absorbs and diffuses the noise.

Office/Business: Administrative, clerical, professional and medical offices are activities which do not necessarily

[6] Lowe M, Whitzman C, Badland H, Davern M, Hes D, Aye L, et al. Liveable, healthy, sustainable: What are the key indicators for Melbourne neighbourhoods? Melbourne: Place, Health and Liveability Research Program, University of Melbourne, 2013.

require the land area/floor space or exposure of other land uses. Although offices require building and parking facilities, these needs are quite distinct from those of commercial uses and service industries.

Other Retail: Many of these activities are not normally accommodated in a shopping centre. By virtue of

their scale and special nature the goods of these activities separate them from the Shop/Retail category (for example car sales yard or carpet showroom).

Owner-occupiers: a person who owns the dwelling they live in.

Peer-to-peer economy: a decentralised economic model whereby two individuals interact to buy or sell goods and services directly with each other, without an intermediary third-party, or without the use of a company of business.

Perth city: land within the City of Perth local government area which expanded on 1 July 2016 to include parts of Crawley and Nedlands (previously in the Cities of Subiaco and Nedlands). This includes a total area of approximately 13.85 square kilometres and is also commonly referred to in the document as 'the city'.

Planning controls: the devices, specifically statutory controls, used to managing the development of land and buildings.

Planning system: the broad institutional and regulatory arrangements that govern land use planning in Western Australia.

Plot ratio: the same definition as the City Planning Scheme No. 2, and means the ratio of the floor area of a building to the area of land within the boundaries of the lots on which that building is located.

Plot-ratio controls: a type of density and built form control for future development where a maximum plot-ratio is applied to a designated area under a planning scheme.

Precinct: has the same definition as the City Planning Scheme No. 2, and means an area within a neighbourhood or which may cross over neighbourhood boundaries and is of limited size having –

(a) A similar use or other characteristic; and
(b) Specified boundaries.

Price point: a point on a scale of possible prices at which something might be marketed.

Primary resource sector: economic sector involved in the extraction and collection of natural resources, such as iron ore and timber, as well as activities such as agriculture and fishing.

Public realm: the space around, between and within buildings that are publicly accessible, including streets, piazzas, parks and open spaces. These areas and settings support or facilitate public life and social interaction.

R-Codes: State Planning Policy 7.3 – Residential Design Codes.

Registered Aboriginal sites: a place which has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*.

Rescinded (in terms of policy): a policy, procedure or decision which has formally been reversed or cancelled by a resolution of Council.

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

Saltmarsh: a plant species/community associated with the Swan Coastal Plain and Swan River.

Scheme text: text of a local planning scheme referred to in Part 2 s.8 of the Planning and Development (Local

Planning Schemes) Regulations 2015.

Scheme use area (or 'land-use zone'): an area, identified under City Planning Scheme No. 2, City of Nedlands Town Planning Scheme No. 2 or City of Subiaco Town Planning Scheme No. 4 that is classified and divided into scheme use areas or zones, with the exception of reserves, as shown on an associated city or local planning scheme map. Appropriate uses are prescribed for each scheme use area or zone under the respective scheme.

Servicing: the supplying or supplier of utilities or commodities, as water, electricity, or gas, required or demanded by the public.

Shop/Retail

Any activity which involves the sale of goods from a shop located separate to, and/or in, a shopping centre other than those included in Other Retail.

Short-term accommodation: has the same definition as City Planning Scheme No. 2 and Planning and Development (Local Planning Scheme) Regulations 2015, and means premises used for accommodation that may be occupied by the same person/s for a maximum period of three months within any twelve month period, and are not subject to residential tenancy agreements (residential leases).

Sleeve: an architectural element of a building, where a strip of apartments or other active uses is built on the outer face of a podium, usually where facing the street or public realm, to remove any visibility to internal car parking areas.

South West Region: the area of land located in the south-western corner of Australia and covers an area of nearly 24,000 square kilometres.

Spatial Plans: plans prepared to spatially demonstrate the strategies and actions of the Local Planning Strategy.

Staying activity (also 'staying activities') include a range of participatory activities which encourage people to stay or remain in a public place/space.

Streetscape: is a term used to define the character, built form, view or scene of a street, especially in a city or urban setting.

Structure plans: plans for the coordination of future subdivision and zoning of an area of land, including the provision of transport networks, public open space, utility and service networks, urban water management, development standards and community infrastructure.

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

Sustainable urban existence (also 'sustainable urban growth'): a well-planned and coherent settlement pattern, along with carefully managed urban growth and change that delivers wider social, economic and environmental objectives (WAPC, 2006).

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

Urban tree canopy (also 'canopy cover'): has the same definition as the City's Urban Forest Plan, and means the percentage of urban land covered by tree canopy when viewed from above.

Urban consolidation: refers to urban development processes such as infill and increased densities, and/or the logical extension or 'rounding off' of existing urban and industrial areas to more effectively utilise existing social, service and transport infrastructure.

Urban expansion (also 'urban growth'): the rate at which the population of an urban area increases.

Urban forest: has the same definition as the City's Urban Forest Plan, and is broadly refers to the collection of green spaces, trees and other vegetation that grows within an urban area, on both public and private land.

Urban heat island: has the same definition as the City's Urban Forest Plan, and means an urban area which experiences elevated temperatures compared to their outlying surroundings, creating an 'urban heat island'.

Urban planning (also 'town planning'): the process of managing the development of land and buildings.

Urban settlement: is a concentrated settlement that constitutes or is part of an urban area.

Urban village: urban development typically characterised by medium to high density housing, mixed use zoning, fine grain built form, good public transit and an emphasis on walkability and public space.

Urban-zoned: land reserved and zoned Urban under the Metropolitan Region Scheme.

Value capture: the process of retaining some percentage of the value provided in every transaction.

Wayfinding: information systems, such as signage or tactile paving that guide people through a physical environment and enhance their understanding and experience of the space.

Weighted population density: the mean of the densities of sub-areas of a larger area, weighted by the populations of those sub-areas.

2.2. Acronyms

ABS: Australian Bureau of Statistics

BCA - Building Code of Australia

BUWM: Better Urban Water Management

CPC: City of Perth Committee

CPPC: Central Perth Planning Committee

CPS2: City of Perth City Planning Scheme No. 2

DAA: Department of Aboriginal Affairs

DevWA: Development WA

DFES: Department of Fire and Emergency Services

DOH: Department of Health

DPLH: Department of Planning, Lands and Heritage

DOT: Department of Transport

DWER: Department of Water and Environmental Regulation

DBCA: Department of Biodiversity, Conservation and Attractions

DWMS: District Water Management Strategy

LGA: Local Government Area

LPS26: Local Planning Scheme No. 26 – Normalised Redevelopment Areas

LWMS Local Water Management Strategy

MHI: Municipal Heritage Inventory

OBRM: Office of Bushfire Risk Management

SPC: State Planning Committee

SPP: State Planning Policy

TPS4: Town Planning Scheme No. 4

UWA: University of Western Australia

QEII: Queen Elizabeth II Medical Centre

UWMP: Urban Water Management Plan

WAPC: Western Australian Planning Commission

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