



Department of **Planning,
Lands and Heritage**



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Western Australia.*

WA Tomorrow

Population Report No.11

Medium-Term Age-Sex Population Forecasts 2016 to 2031



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Forecast summary

I. What is WA Tomorrow?

WA Tomorrow (Population Report No. 11) is a series of trend-based population forecasts, by age and sex, for Western Australia and its sub-regions from 2016 to 2031. These forecasts represent a best estimate of future population size and age-sex structure if trends in fertility, mortality and migration continue.

Key trends from WA Tomorrow:

- Fertility rates are stable, however, the number of births increases as the population increases.
- Mortality rates continue to decline, offsetting the number of deaths attributed to the large baby boomer population reaching older ages.
- Migration levels are increasing and will return to long-term trends by about 2021.

The WA Tomorrow population forecasts are produced by the Western Australian Planning Commission in collaboration with the Department of Treasury. They are produced every five years using the latest results from the five-yearly Census of Population and Housing and other data. The forecasts refer to the 30 June in the stated year and supersede WA Tomorrow Population Report No. 10 (2015). They are the official Western Australian Government forecasts to 2031.

Population projections or forecasts are not just a prediction¹ of the future population, they also highlight opportunities or challenges that may need to be addressed. These population forecasts cannot foresee events that change trends. These include significant shifts

in government policy, natural disasters and epidemics. Forecasts are best assessed on their effectiveness for the intended purpose, rather than just on their accuracy. In this case, the forecasts are primarily designed to give the demographic details of age and sex. They perform better in this case than they do when assessed only by total population size. Stable geographic areas will tend to fare better in this respect than fast-growing areas.

The WA Tomorrow forecasts are distinct from government strategies, frameworks and scenarios which are based on a target population size and seek to guide future growth to deliver desired patterns of urban form.

WA Tomorrow provides the State Government with an estimate of the future population structure by age, sex and region in Western Australia. The forecasts are used across government agencies to plan for future service and infrastructure requirements where a change in the age and/or sex distribution needs to be considered. They are particularly important to health and education providers in planning future infrastructure and service requirements such as primary schools and hospitals.

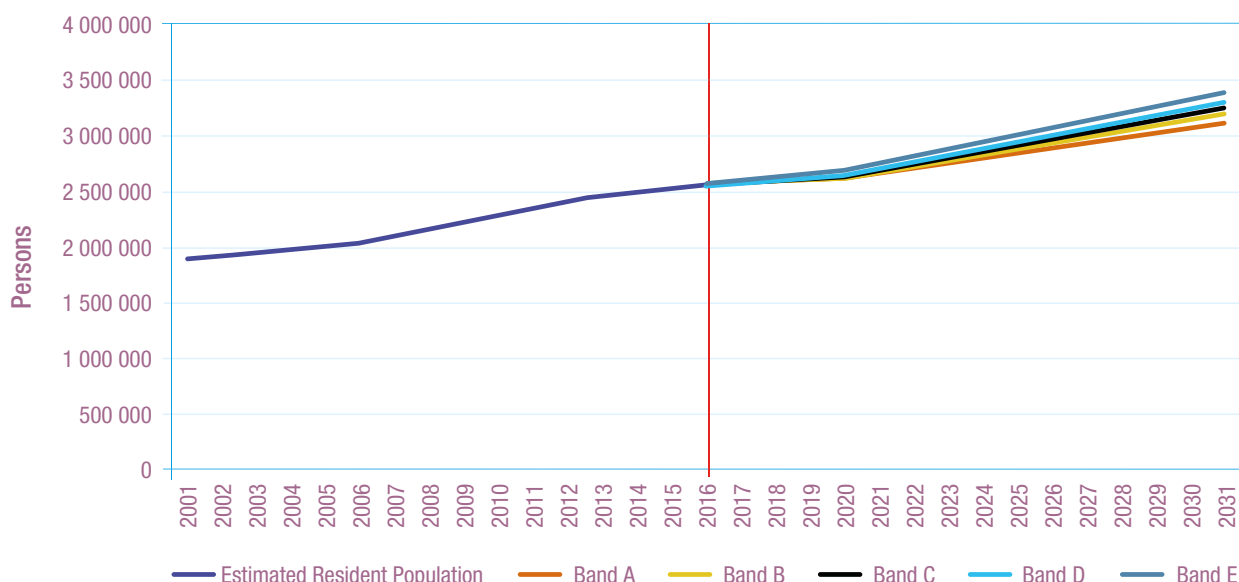
¹ A prediction is the expected mathematical output should all the model assumptions remain unchanged during the forecast horizon.

2. Forecast population

The population of WA will increase by nearly 700 000 people or 27 per cent in the 15-year period to 2031. As seen in Figure 1, the forecast is presented as bands² ranging from low (Band A) to high (Band E). The median band is C. Bands A and E show that in 2031 the forecast population could range between 3.1 million and 3.4 million even if the rates of mortality, fertility and migration were perfectly predicted. Table 1 provides a summary of the five forecast bands for Western Australia.

The forecast reflects a gradually increasing growth rate for Western Australia (see Table 2). Moderate population growth is forecast to 2021 after which it is expected to increase to 1.61 per cent by 2031. This compares with the lowest change rate of 1.3 per cent per year (Band A) and highest change rate of 1.9 per cent per year (Band E) (see Table 2). The increasing growth rate is due to a forecast increase in overseas migration.

Figure 1: Total population, Western Australia, 2001 to 2031



Source: WA Tomorrow Population Report No. 11; Estimated Resident Population - Australian Bureau of Statistics Catalogue No. 3218.0

Table 1: Forecast population for Western Australia

Year	Band				
	A	B	C	D	E
2016	2 559 000	2 559 000	2 559 000	2 559 000	2 559 000
2021	2 665 000	2 698 000	2 720 000	2 744 000	2 779 000
2026	2 882 000	2 940 000	2 980 000	3 022 000	3 083 000
2031	3 117 000	3 196 000	3 252 000	3 308 000	3 391 000

Source: WA Tomorrow Population Report No. 11

² For a full explanation of bands please see the Notes tab in Excel spreadsheets in <https://www.dph.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts>.

Overseas migration is currently below average for Western Australia after the mining boom. It is assumed that overseas migration rates will return to average levels by 2021. This forecast return to average has contributed to the rising average annual growth rate (AAGR).

Past trends have shown fluctuating population growth in Western Australia. An analysis of structural change³ in population growth from 1971 to 2018 shows these changing levels of growth (See Figure 2). By using a minimum of three-year segments to analyse structural change, the effect of births and net overseas migration on population change can be seen.

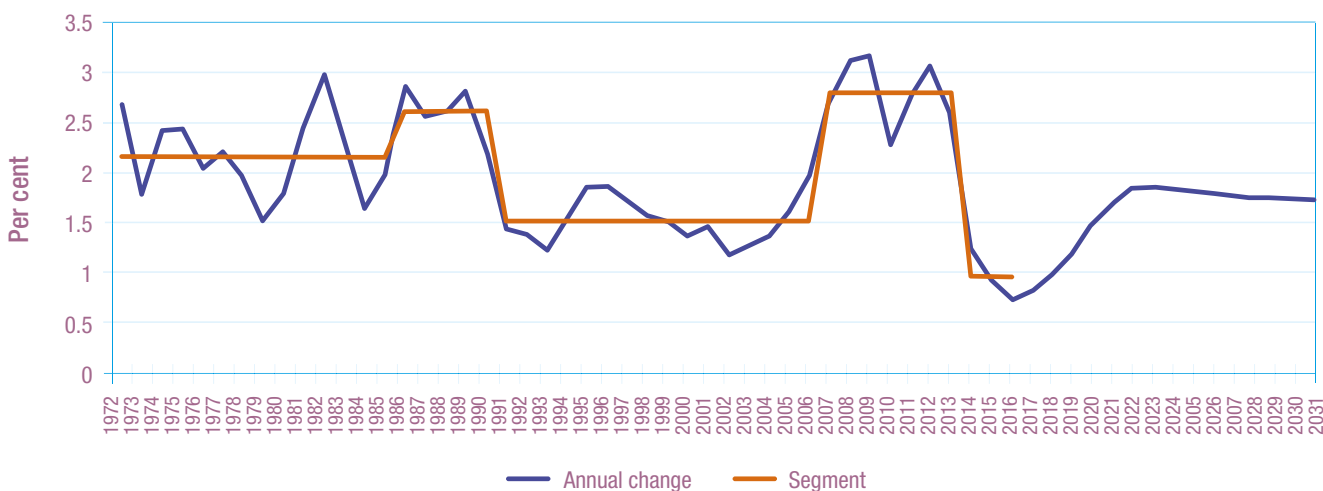
This is evident in the mid-1980s and the mid-2000s to 2013 when migration was strong. The introduction of the baby bonus in 2006, which temporarily boosted the number of births, together with strong migration, saw population growth increase to 2.79 per cent during the last economic boom. Prior to this, from 1991 to 2006, there was a sustained period of lower growth of 1.5 per cent, attributable to lower levels of migration and births over that time. See also Section 6 Population Dynamics.

Table 2: Average annual growth rate from 2016, Western Australia

Year	Band				
	A	B	C	D	E
2021	0.82%	1.06%	1.23%	1.41%	1.66%
2026	1.20%	1.40%	1.53%	1.68%	1.88%
2031	1.32%	1.49%	1.61%	1.73%	1.89%

Source: WA Tomorrow Population Report No. 11

Figure 2: Structural change in population growth (%), 1971-2031



Source: WA Tomorrow Population Report No. 11; Estimated Resident Population - Australian Bureau of Statistics Catalogue No. 3218.0

³ Structural change refers to significant change in levels of economic activity. Booms and busts are examples of structural change.

3. Changing age structure

The age-sex pyramid below (Figure 3) shows the changing age-sex structure between 2016 (blue outline) and 2031 (orange bar).

Chart 1 shows the number of persons in each age group; while Chart 2 shows the proportion of each age group to the total female and male population. For the first time, WA Tomorrow includes forecasts for each age cohort to 100+ years. Previous forecasts were limited to 85+ years.

WA Tomorrow highlights several features of the State's population age-sex structure. Chart 1 represents total persons by age and sex and shows that:

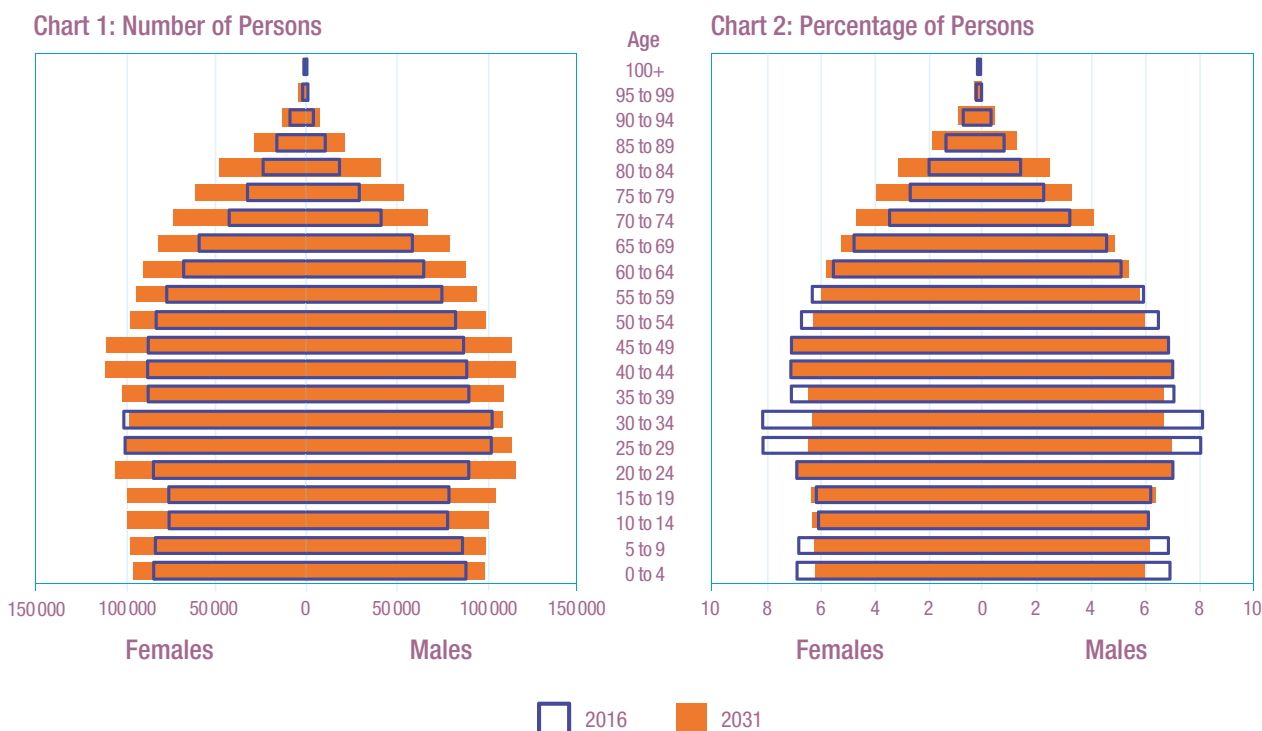
- The number of persons for each age cohort is forecast to increase between 2016 and 2031, except for a slight decrease in the number of females aged 30 to 34 years.

- The forecast for 2031 indicates significant overall ageing of the population aged 60 years and over. This is consistent with trends across all developed countries where increased life expectancy has resulted in an ageing population.

Chart 2 represents the proportion of persons by age and sex. Key changes in the age distribution include:

- An overall reduction in the proportion of persons aged 25 to 39 years will result in a decrease in the proportion of working-age persons (15 to 64 years) from 67 per cent in 2016 to 64 per cent in 2031. This decrease has a significant impact on the ratio of people in the workforce to those who are economically dependent. This is discussed further in Section 5 Opportunities and Challenges.

Figure 3: Age-sex distribution (Band C), Western Australia, 2016 and 2031



Source: WA Tomorrow Population Report No. 11

- An overall decrease in the proportion of children aged 0 to 9 years from 13.4 per cent in 2016 to 12 per cent in 2031 is expected. This is most likely attributed to the decline in the proportion of persons at the family formation stage (i.e. persons aged 25 to 39 years).
- Between 2016 and 2031, the proportion of persons aged 60 years and over is projected to increase from 18.8 per cent in 2016 to 23.5 per cent in 2031. This is discussed further in Section 4 The Ageing Population.

It should be noted that while some age groups may show a declining proportion and others an increase, overall, the total number of people is forecast to increase across most age groups.

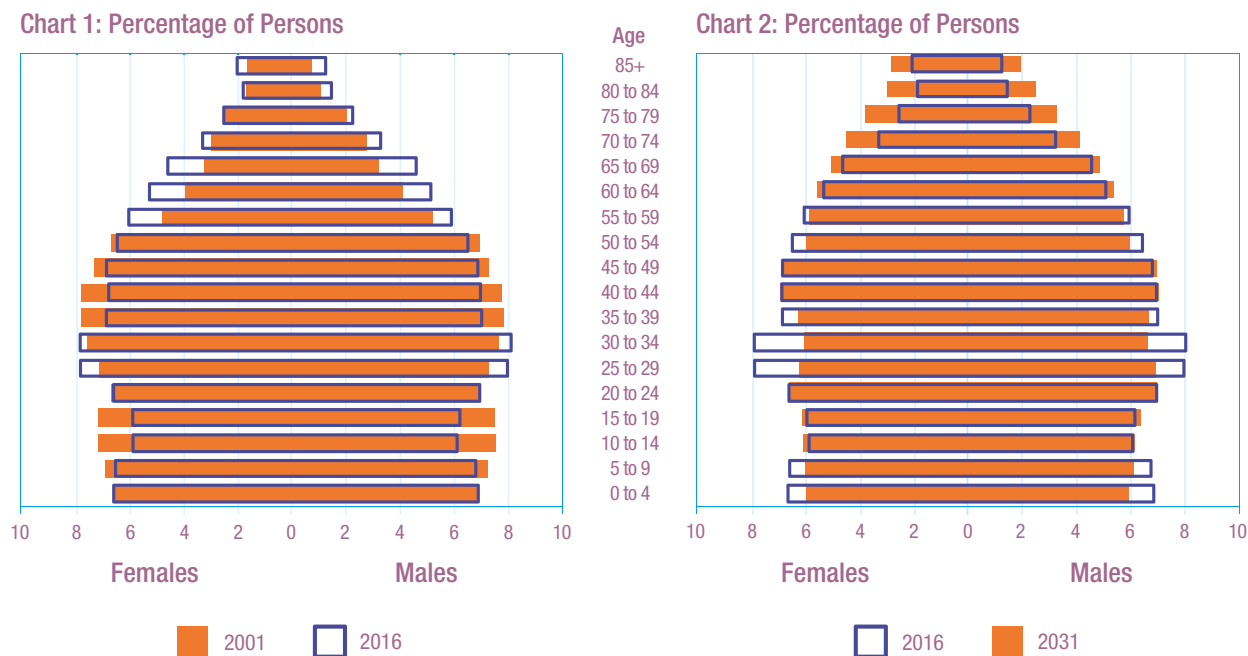
Past trends

To better understand the forecast decline in the proportion of 25 to 39 year-olds by 2031, it is useful to examine past trends in the age-sex structure. Table 3 below shows that those persons aged 25 to 39 years in 2031 were aged 10 to 24 years in 2016.

Table 3: Age cohorts 2001 to 2031

2001	2016	2031
-	10-14	25-29
0-4	15-19	30-34
5-9	20-24	35-39

Figure 4: Age-sex distribution (%), Western Australia, 2001 to 2016 and 2016 to 2031



Source: ERP – Australian Bureau of Statistics Catalogue No. 3235.0; WA Tomorrow Population Report No. 11

A pyramid chart can be viewed as age groups 'travelling' up the chart rather than comparing the same age group at the two points in time. When looking at the 2001 to 2016 Estimated Resident Population (ERP) data for Western Australia (Figure 4, Chart 1) some distinct features are visible over the 15-year period. These include:

- a large decline in 10-19 year-olds (25-34 year olds by 2031)
- an increase in 25-34 year-olds (40-49 year olds by 2031)
- ageing 55+ years.

Based on a trend forecast, the observed fall in the 10 to 19 year olds will have a major effect on the forecast for 2031. As the 10 to 19 year old cohort ages 15 years to 2031 they will be 25 to 34 years old, and their numbers are forecast to be fewer; hence the reduction seen in Figure 4, Chart 2. The number of persons aged 35 to 39 years are also forecast to decline in 2031, most likely due to a lack of growth in the 20 to 24 year old cohort between 2001 and 2016.

Throughout the mining boom, the age structure of interstate and overseas migrants served to mitigate some of the effects of an ageing population in Western Australia. However, slower growth forecast for net migration to 2021 has resulted in a lower proportion of persons aged 25 to 39 years and 0 to 9 years projected for 2031.

Population dynamics and the age-sex structure

Given the strong overseas migration in the late 1980s, the number of births remained stable. This was because fertility rates had been declining. The 2004 WA Tomorrow Population Report No.6 reported that "The total fertility rate for Western Australia fell from 1.95 in 1981 to 1.74 in 2001 and is projected to fall to 1.52 in 2021". It was this dynamic that we can see in the model, that is, the age and sex structure for 2031 is directly dependent upon what has happened in previous years. This is sometimes referred to as population momentum.

4. The ageing population

Ageing is a strong feature of the forecast. In particular, persons aged 85 years and over are forecast to experience a greater average annual growth rate than persons aged 65 years and over by 2031.

Growth in the older population is two-fold. Firstly, the growing proportion of older age cohorts in Western Australia is the result of the large 'baby boom' population, born around 1946 to 1966, who are ageing. Secondly, life expectancy has been steadily increasing due to improved health services and advances in medicine and technology.

Between 2011 and 2016, persons aged 65 years and over and 85 years and over were the fastest-growing age group in Western Australia, both with a growth rate of 3.9 per cent per annum. This trend is forecast to continue with

the number of persons aged 65 and over and 85 and over growing at much faster rates than persons aged below 65 years. By 2031, persons aged 65 years and over are forecast to increase by more than two-thirds to 586 700 persons, while persons aged 85 years and over will almost double between 2016 and 2031 to 78 200 persons.

Table 4 shows that the average annual growth rate forecast for older people is significantly higher than that for the working age population (15 to 64 years) and children (0 to 14 years). The implications of an ageing population are many. The increased number of elderly will impact health services and aged care planning, welfare spending, housing and infrastructure requirements, as well as a shrinking workforce and resultant fiscal pressure.

Table 4: Average annual growth rate from 2016, Western Australia

Year	0-14 years	15-24 years	25-39 years	40-64 years	15-64 years	65+ years	85+ years
2021	1.3%	0.0%	0.4%	1.1%	0.7%	3.7%	3.0%
2026	1.2%	1.5%	0.4%	1.5%	1.1%	3.7%	3.7%
2031	1.2%	1.7%	0.5%	1.6%	1.3%	3.6%	4.2%

Source: WA Tomorrow Population Report No. 11

5. Opportunities and challenges

While the population is ageing, it is also seeing a decline in the proportion of younger people. This has important economic and labour market implications in terms of the changing ratio of the non-working population (0 to 14 years and 65 years and over) to the working population (15 to 64 years). This ratio is referred to as the dependency ratio (Table 5).

In the long term, as the population ages, the dependency ratio is forecast to increase, rising from 49.1 per cent in 2016 to 56.8 per cent in 2031. Table 6 shows that the balance between children who are dependent and older dependent people will gradually shift towards more older dependents as the baby boomers move into retirement age groupings and the overall population ages.

Table 5: Dependency ratio, Western Australia

Age cohort	2016	2031
0-14 years	28.9%	28.5%
65 years and over	20.2%	28.3%
Total dependency ratio	49.1%	56.8%

Source: WA Tomorrow Population Report No. 11

A rising dependency ratio is a growing concern as the population ages. However, the dependency ratio is limited as it only considers age when determining whether a person is economically dependent or not. Other factors may also determine economic dependency including illness or disability, early retirement, carer/parental responsibilities, student status, and long-term unemployment. The workforce can no longer be easily identified as those people aged 15 to 64 years as a growing number of people continue working past 65 years.

Based on the Census of Population and Housing, the proportion of persons aged 65 years and over who reported being in the labour force almost doubled between 1981 and 2016. During the same period, the proportion of persons aged 15 to 19 years and over who reported being in the labour force decreased by 11.3 percentage points.

Despite these changes to labour force participation, the dependency ratio does serve as another indicator of the changing composition and ageing of the population and the resultant fiscal pressure of increased government spending on welfare/pension recipients. In response, the retirement age has been progressively raised to mitigate some of this effect.

Table 6: Total labour force 65 years and over

Year	15-19 years	65+ years	64-69 years	70-74 years	75+ years
2006	55.9%	9.2%	20.0%	7.8%	2.8%
2011	52.8%	12.9%	28.1%	11.4%	3.0%
2016	49.2%	14.4%	28.2%	13.6%	3.9%

Source: Census of Population and Housing, ABS

6. Population dynamics

The cohort component model forms the basis of the WA Tomorrow forecasts. See Section 1.1, Explanatory Notes. The individual demographic components which comprise population change – births, deaths and migration – are forecast by applying rates for fertility, mortality and local migration to the appropriate population and direct counts for overseas and interstate migration. A crucial step is to age the population each year. The forecast is the sum of the interactions of these components, also known as population dynamics.

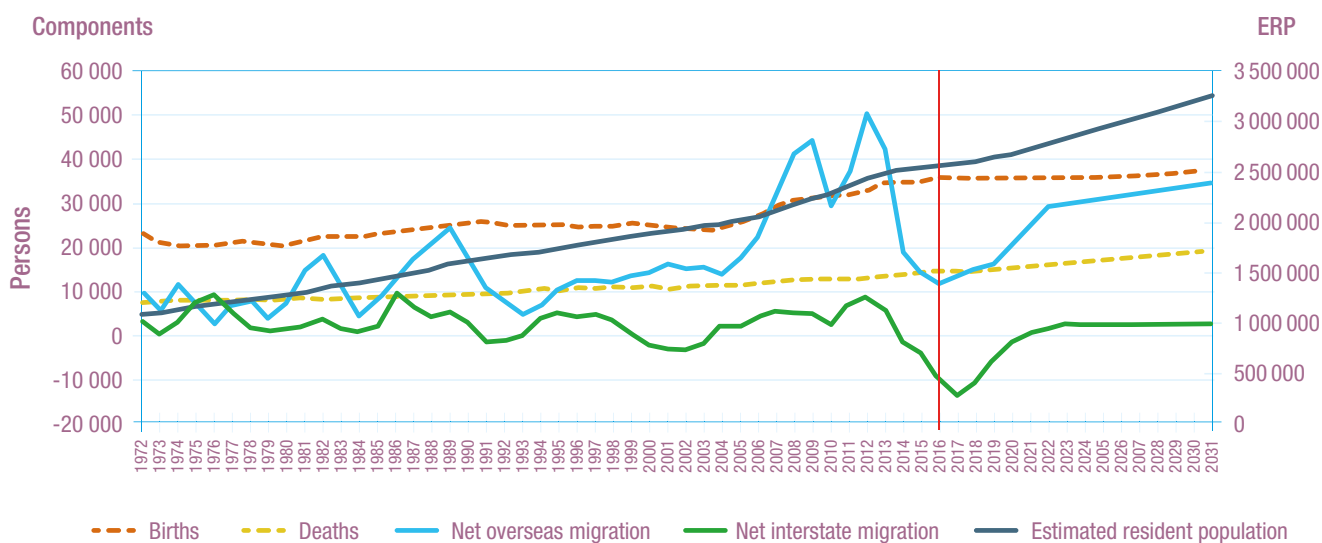
Figure 5 shows the historical and forecast population dynamics for Western Australia – births, deaths and interstate and overseas migration. The population dynamics model used for the forecasts reveals what occurred historically to the individual demographic components of the population as well as their forecast path.

The biological processes of mortality and fertility are more stable compared with the economic, social and cultural processes that can shape population change. In particular, the predominantly economic⁴ process of overseas migration dominates the overall volatility of population change. As a result, the overall size of the forecast population is most likely to be askew because of inaccurate assumptions about overseas migration.

Key trends from forecast population dynamics (Figures 5 and 6):

- Births is the largest and most stable contributor to population growth. WA Tomorrow assumes that fertility rates will remain stable during the forecast period, which means that births will continue to rise as the population grows. Between 2016 and 2031, births will contribute an estimated 542 000 persons to Western Australia's projected population.

Figure 5: Population dynamics, Western Australia, 1972 to 2031

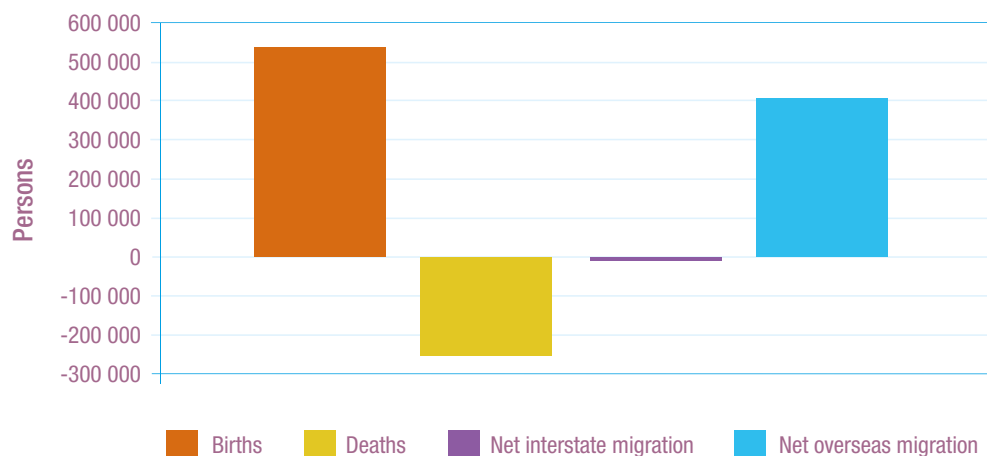


Source: Australian Historical Estimates, ABS cat. no. 3105.0.65.001; WA Tomorrow Population Report No. 1.1.
 Births and deaths by year of occurrence (Year ended 30 June); Net Overseas Migration and Net Interstate Migration (Year ended 30 June)

⁴ It is clear that the peaks in migration relate to topics such as jobs (mining booms, Snowy River), commodity price fluctuations or high GDP

- Deaths is the main contributor to negative population dynamics. Between 2016 and 2031, deaths will reduce Western Australia’s projected population by around 248 000 persons. While improved life expectancy will mitigate some of the effects of an ageing population on mortality rates, population growth will still increase the number of deaths projected as the large baby boomer generation moves through the older ages.
- Migration rates can vary substantially and can be very volatile. This is particularly true for a resource economy such as Western Australia where a cyclical industry can attract high migration rates during a boom period and then return to normal. Currently there is subdued growth which is expected to return to normal rates after 2021.
- Overseas migration will play a lesser role than births to population change during the projection period. Between 2016 and 2031, net overseas migration (NOM) is forecast to contribute an estimated 408 000 persons to Western Australia’s population.
- The magnitude of net interstate migration in Western Australia is smaller than overseas migration but has also been volatile during this period, particularly as a result of the resource cycle and its effect on the State’s economy and employment opportunities. Overall, interstate migration will have a negative effect on population change during the forecast period. However, it is forecast to gradually improve to long-term positive levels by 2022.
- The projected components all show continuity with past data.

Figure 6: Cumulative effect of components over forecast period (2016 to 2031)



Source: WA Tomorrow Population Report No. 11

7. Demographic reasons for Western Australia's population growth

The increase in Western Australia's population to 2031 will be driven by births and migration.

WA Tomorrow forecasts a slower growth rate for Western Australia to 2031 based on more recent trends in population estimates.

Between 2007 and 2013, Western Australia experienced a very high growth rate due to the economic boom and associated increase in net migration. This growth has since slowed, most likely due to the temporary nature of the construction phase of mining and allied industries. This impacted on employment and reduced migration flows for Western Australia, which, in turn, has impacted on projected population growth to 2031.

8. Changes in trends since WA Tomorrow Population Report No.10

The main difference between these forecasts and those in WA Tomorrow Population Report No.10 is that the current forecasts are lower. This is not unexpected because of the extraordinary rise and fall in overseas and interstate migration to the State population during the last intercensal period (2011 to 2016). If the net effect of overseas and interstate migration is measured, there were around 50 800⁵ overseas migrants and 8 600⁶ interstate migrants in 2011-12. Subsequently, the number of net overseas migrants dropped to its lowest at 11 600 persons in 2015-16, while net interstate migrants recorded a loss of 10 000 persons.

The WA Tomorrow Population Report No.11 projections show slower population growth for the State compared to the previous projections. The revised assumptions mean that WA is likely to have 3.25 million people by 2031. The current forecast is nine per cent (or nearly 300 000 persons) lower at 2026 than previously forecast in WA Tomorrow Population Report No. 10 (See Figure 7).

⁵ ABS.Stat Net overseas migration, Arrivals, departures and net, State/territory, Major Groupings and visas – Financial years, 2004-05 onwards. Extracted 3 September 2018

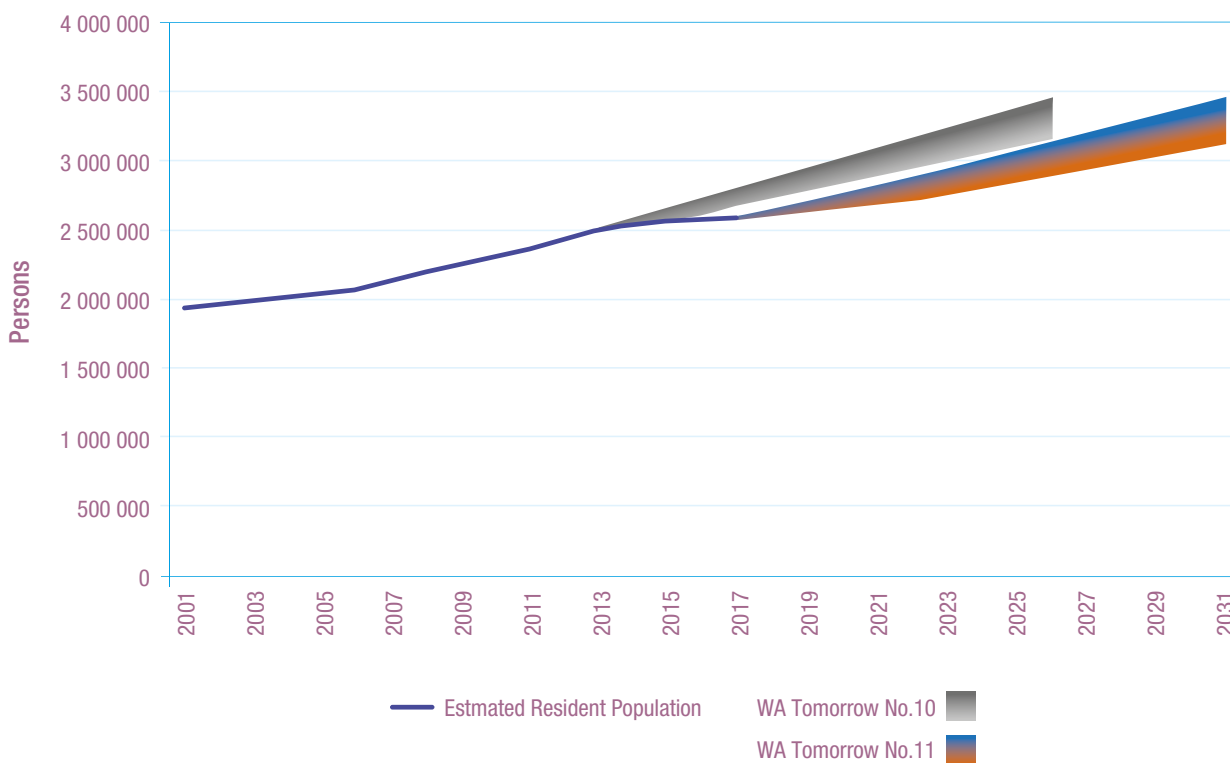
⁶ ABS.Stat Interstate migration: Arrivals, departures and net, State/territory, Age and sex – Financial years, 1996-97 onwards. Extracted 3 September 2018

The lowered forecast for WA Tomorrow Population Report No.11 is evident when comparing the average annual growth rate (AAGR) of the two forecasts (Table 7). WA Tomorrow Population Report No.10 begins with a strong AAGR which is tempered slightly by 2026. The current forecast begins with a lower AAGR which is expected to gradually increase.

Table 7: Average annual growth rate comparison, WA Tomorrow Population Report No.10 and 11

Year	WA Tomorrow No.10	WA Tomorrow No. 11
2021	2.37%	1.23%
2026	2.23%	1.53%
2031	-	1.61%

Figure 7: Population forecast comparison, WA Tomorrow Population Report No.10 and 11



Source: WA Tomorrow Population Report No. 10 and 11; ABS Catalogue No. 3101.0

9. The future

The State's population is projected to continue to age due to the large 'baby boom' population growing older and an increasing life expectancy. The implications of an ageing population are many. It will present challenges to labour markets, government tax and spending, and the wider community. It will inevitably affect the population's dependency ratio as the proportion of persons who are economically dependent or outside recognised labour force age cohorts increase. An ageing population will also emphasise the need to adapt service and infrastructure delivery appropriately.

During the mining boom (2007 to 2013), migration played an important role in boosting population growth and mitigating some of the effects of an ageing population by increasing the number of younger, working age people in the State. In a post-boom economy, however, net migration to Western Australia and overall population growth has declined steadily between 2013 and 2017. This is reflected in the projected age structure and the growth rate for Western Australia to 2031. This reduction in net migration and shift in demographic structure may have significant implications on infrastructure and service delivery, and the labour market.

10. Further information

WA Tomorrow forecasts are available for the State and two sub-state geographies:

- Western Australia by five-year age groups by sex from 2016 to 2031
- SA2⁷ geographies by five-year age groups by sex from 2016 to 2031.
- Local government area (LGA) geographies by five-year age groups by sex from 2016 to 2031

The forecast data is available at <https://www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts>

Future releases

- WA Tomorrow Population Report No.11 Story Maps

⁷ See Notes tab in <https://www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts> for explanation of SA2 geography.

11. Explanatory Notes

What is WA Tomorrow?

WA Tomorrow is a medium-term population forecast to 2031 for Western Australia, SA2s and local government areas.

What does SA2 mean?

SA2 refers to the Statistical Area level 2. It is a standard geographic area produced by the ABS that typically encompasses one or more suburbs in urban areas and sometimes one or more local authorities in regional areas. SA2s generally have a population of between 3,000 to 25,000 persons, with an average of around 10,000 persons. For a full explanation visit -

[https://www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard\(ASGS\)](https://www.abs.gov.au/websitedbs/D3310114.nsf/home/Australian+Statistical+Geography+Standard(ASGS))

What are WA Tomorrow SA2s?

WA Tomorrow attempts to follow as closely as possible the current geography standard produced by the ABS (ASGS 2016). A hybrid geography is used where an SA2 is either too small or data is not available. Check the geography tab in Excel spreadsheets⁸ to see how they relate to ABS SA2s.

What data is used to produce forecasts?

WA Tomorrow forecasts uses demographic data produced by the Australian Bureau of Statistics as its basis. This includes:

- Estimated Resident Population; projections are based on the 30 June 2016 population estimates which incorporate the results of the 2016 Census of Population and Housing

- five-yearly Census results on migration
- the number of births and deaths
- regional internal migration estimates.

In the Perth metropolitan region and the local authorities of Mandurah and Murray, supplementary information from the Urban Land Development Outlook (ULDO) has been used. The ULDO identifies land expected to be developed for residential and other purposes in Perth and Peel over the next 20+ years.

How are they produced?

The model used to produce the age by sex forecasts is called the cohort-component model. The cohort-component model is the most widely-used method employed by demographers for preparing population projections.

The forecast is based on a series of assumptions regarding what is likely to happen in the future with regards to the components, including the number of births, deaths and migrants. The assumptions are based on an analysis of recent trends in these components by looking at the rate⁹ at which these occur. These rates are referred to as the fertility rate, mortality rate and migration rate. Once the assumptions are set, the rates are forecast to estimate the future numbers of births, deaths and migrants.

The cohort component model uses the demographic equation at its core:

New population = Base population + births – deaths + in-migration – out-migration

⁸ See Geography tab in Excel spreadsheets in <https://www.dplh.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts>

⁹ A rate is usually calculated as the number of events per x number of persons

The main processes are:

- taking the base population of an area, disaggregated by age and sex to form cohorts (age groups)
- using the fertility rate to calculate the number of births
- using the mortality rate to calculate the number of deaths
- using the migration rate to calculate the number of migrants (overseas, interstate and intrastate)
- calculating the new population for the following year by ageing the population, adding the number of births to the cohort aged 0, removing deaths from the appropriate cohorts and adding and subtracting the number of migrants.

This process is repeated for each year in the forecast.

This method has the advantage of providing age-sex distributions in addition to total population numbers.

What is meant by “assumptions”?

The assumptions underlying the cohort-component model about the rate of births, deaths and migration are critical to projecting the population. They rely on understanding what may be happening to the demographic rates of fertility, mortality and migration. We do this by examining what has happened in the recent past.

Fertility

Future trends in fertility are an important determinant in future population size, structure and growth. The age-specific fertility rate or ASFR is calculated from the number of live births that occurred during the calendar

year, by age of mother, per thousand of the female resident population of the same age as estimated for 30 June.

The number of births in a population is dependent on three factors:

- the age structure of the female population
- the number of females and
- the number of children each woman of a particular age is likely to have.

Mortality

The age-specific death rate or ASDR is the number of deaths registered at a specific age per 1 000 persons of the same age. Life expectancy at birth estimates represent the length of time that a person is likely to live based on current age-specific death rates. The increase in life expectancy in Western Australia reflects declining death rates at most ages mainly due to improved health services and advances in medicine and technology.

Migration

There are three levels of migration:

- Overseas migration refers to migrants who come to WA with the intention of staying for 12 months or more out of 16 months. It is the most variable or volatile of the components of population growth.
- Interstate migration is the movement of persons between Australia's States and Territories.
- Intrastate migration is the movement of persons within WA. This has the highest number of movers.

At the state level, population forecasting is concerned with the in and out flow of both interstate migration and overseas migration.

Below the state level, the flows between regions, known as intrastate, are also included.

How does WA Tomorrow differ from plans, strategies, targets, scenarios and predictions?

There are different interpretations of these terms.

While it is not always clear, forecasts are fundamentally different to scenarios and targets. WA Tomorrow 2016 is a trend-based forecast, that is, it is what the future population is likely to be if current trends in fertility, mortality and migration continue.

A target can be a number over and above a forecast and is often referred to as aspirational. It helps with critically thinking about what planning needs to take place to achieve the target, especially if the forecast is considerably lower than the target.

A scenario can be a “what if” situation, for example “What happens when you change one or more of the components?”

The WA Tomorrow forecasts are distinct from other government strategies, frameworks and scenarios which are generally longer-term in their outlook and seek to guide future growth to deliver desired patterns of urban form.

How does WA Tomorrow differ from forecasts from the ABS and other providers?

Population forecasts are produced using similar methodologies, that is, the cohort component model and often supplementary information where appropriate, such as future housing development. These are some questions to consider when comparing forecasts:

- Is it a competition model? The WA Tomorrow state forecast is the over-arching constraint for the SA2s and local government areas.
- When were they produced?
- Which base population was used?
- Is there a different time horizon?
- Were different assumptions used?
- If it is a small area forecast, e.g., Local Government Area, is there a commensurate forecast for the state used as the constraint?
- Is the geography different?

Why are we using trend-based forecasts?

WA Tomorrow is a medium-term trend forecast. This is useful for meeting infrastructure upgrades and roll-out plans to meet anticipated service demands that we need to plan for now and during the next few years.

Trend-based forecasts are better suited over the short to medium term. It is unreasonable to expect that these trends will prevail in the long term due to issues such as government policy and plans, economic cycles or natural disasters, which will change trends.

How certain are we about the forecasts?

All forecasts have uncertainty attached to them. For example, there is uncertainty in the base data, assumptions and model. Another aspect of uncertainty is randomness¹⁰. Statistical techniques are used to overcome some uncertainty and are also used to forecast uncertainty. The outcome is to provide the user with a realistic outlook on the future by providing a range (Bands) of forecasts, so that realistic and flexible plans may be made.

¹⁰ See Randomness tab in Excel spreadsheets in <https://www.dph.wa.gov.au/information-and-services/land-supply-and-demography/western-australia-tomorrow-population-forecasts>

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