DEMOGRAPHIC ANALYSIS

**Exploring population forecasts to inform the Parkes
Local Strategic Planning Statement**

Parkes Shire Council
February 2020

ASTROLABE
GROUP

About Astrolabe Group

Our vision is to create a positive impact for people and places by addressing complex challenges. We are a multi-disciplinary team that seeks to understand the challenges and opportunities for each client and the values driving them.

This report was prepared for Parkes Shire Council. In preparing the report, Astrolabe has made every effort to ensure the information included is reliable and accurate. Astrolabe is unable to accept responsibility or liability for the use of this report by third parties.

Contents

List of acronyms

ABS   Australian Bureau of Statistics

ERP   Estimated Residential Population

LGA   Local Government Area

LSPS   Local Strategic Planning Statement

NIM   Net Internal Migration

NOM   Net Overseas Migration

SA2   Statistical Area 2

Executive Summary

Parkes Shire is currently experiencing a significant employment boom, not witnessed since the construction of the Northparkes Mines at Goonumbla in the early 1990s. This new construction era has largely been brought about as a result of road, rail, mining and general construction projects in and around the Parkes area. How this employment generation is influencing the resident shire population, housing availability and access to community facilities is largely unclear from mainstream demographic data, given the majority of construction projects has occurred post the 2016 Census.

Recent State government announcements of their continued investment in the Parkes National Logistics Hub Special Activation Precinct could see the recent short-term employment gains extending into the mid-2020's, which could also encourage longer-term changes to the demographic profile in and around the Parkes Shire. In particular, increased migration of full time workers and their families into Parkes and surrounding towns and reduced out-migration of shire residents.

The Local Strategic Planning Statement process provides a timely opportunity to review key population factors in the Parkes Shire, enabling consideration for strategic land-use planning. The population data and projections presented in this report is aimed to provide Parkes Shire Council with a number of insights and tools to inform a range of planning decisions related to this process.

About Parke's population

Parkes has a relatively stable population since 2001, with a difference of only 480 people between the smallest population in recent years (14,600 in 2006) and the largest (15,080 in 2011).

Since the peak in 2011, there have been small declines year on year in terms of population size. These changes have been influenced by Parkes' ageing population. Over time there has been a decline at all younger ages, except for those people in their early 20s, and among all people over the age of 50. Since the beginning of the 2000s there has been a notable hollowing out of the working age population. These factors influence potential future growth in Parkes.

Future Scenarios for Parkes

Three projection scenarios were prepared for Parkes Shire Council, with each scenario reflecting different migration levels (internal and overseas). Migration as a key driver of different growth patterns was the focus because changes to both fertility and mortality are likely to be small (e.g. no dramatic changes in the next 10-20 years) and have smaller impacts on long-term growth.

These scenarios include:

1. **Low Growth - Baseline:** reflecting little change to migration with low growth projected,
2. **Moderate growth:** reflecting temporary employment increases and a return to historical migration levels, and
3. **High growth:** responding to long-term positive employment generation.

These scenarios show Parkes growing by almost 3,000 more people over the longer term for the high growth scenario, to virtually no change for the baseline scenario. All scenarios show growth in the number of households living in Parkes and continued population ageing.

These projections are for the usual resident population and do not capture temporary workers who may work in Parkes during the construction of major projects. Measuring how many people will place demand on housing and other infrastructure while not a usual resident is difficult due to limited data. The more temporary staff, the more difficult it is to plan to meet their needs.

Monitoring the potential impact of these temporary populations can be inferred from other data sources, but they are indicative of relative demand rather than specific numbers of people. Monitoring temporary workers is a key issue for Parkes to ensure adequate accommodation and services are available, and does not impact on housing, including affordable housing options. Gathering data on vacancy rates for temporary accommodation and types of guests staying at these places offers one way to estimate numbers of temporary workers, although results need to be tested.

Population Monitoring Framework

A population monitoring framework is presented in this report that identifies those data sets that need to be assessed every year to ensure planning is fit-for-purpose and meeting the needs of the Parkes' population.

Long-term, the population data included in this report indicate Parkes should prepare for initial growth in both the usual resident and temporary populations, stabilising after 10 years or so. This will require additional housing for individuals in Parkes for work, and families or couples making a more permanent move.

The inherent population ageing taking place in Parkes means more households and housing demand. Allowing for universal design options that respond to ageing will therefore be important.

Introduction

Purpose of this report

This report outlines key population factors that need to be considered for strategic land-use planning in the Parkes Shire. It includes the preparation of population and household projections for the Parkes Shire, based on a methodology developed by Astrolabe which takes into consideration the unique issues that are being presented in the Parkes context. Key findings in this report will help inform the draft Parkes Local Strategic Planning Statement (LSPS), which aims to present a long-term land-use plan for the Parkes Shire (2020-2041).

Priority demographic concepts and issues that need to be understood by Council and other stakeholders interested in the planning of the Parkes Shire include:

- Drivers of population change, and how different investment options may affect this.
- The population age profile and how this influences short and long term planning.
- Ways of measuring temporary populations not counted as usual residents.
- What population changes would be needed for the Parkes Shire population to grow.

Other key considerations of this demographic analysis are the impacts of marked increases in construction workers in and around Parkes since the commencement of the Inland Railway (Parkes to Narromine Section) in 2017 and new extensions and additions at the Northparkes Mines in 2019.

It appears from available data, these construction projects have accounted for significant increases in temporary employment in the Parkes Shire. This report looks at ways of measuring these temporary workers, who may not be counted in standard counts of the usual resident population. There are flow on effects for population forecasting and land-use planning, with significant increases and then declines in demand for housing.

The Parkes National Logistics Hub Special Activation Precinct, alongside other economic activities, also has the potential to bring new employment to Parkes. For many of these employment opportunities there will be a period of construction needing many more workers than subsequent operational phases of the development.

This report is comprised of four parts:

1. **Drivers of population change.** This overview shows those factors that will be affected, or need to change, to drive population growth in Parkes.
2. **Population projections.** Shows outcomes from different growth scenarios that reflect the impact of different migration responses to employment opportunities.
3. **Temporary populations**. Summarises key issues to monitor for those people who may move temporarily to Parkes for employment but not live there on a permanent basis. Includes an assessment of how to measure and monitor these populations.
4. **Population framework for monitoring change.** Identifies key indicators for Parkes Shire Council to monitor and to assess if a different response is required.

Parkes Shire Council

Parkes Shire Council is located in the Central West of NSW, five hours drive from Sydney and three hours from Canberra. On the Newell Highway, it intersects with essential rail corridors and this prime location allows the connection of suppliers and customers via road or rail.

As at 30 June 2018, the Shire had a population of 14,900. Most people (12,000) live in the main town of Parkes itself, which is surrounded by the smaller townships of Peak Hill (1,150), Bogan Gate (300), Trundle (660) and Tullamore (370).

Figure 1: Parkes Shire Council
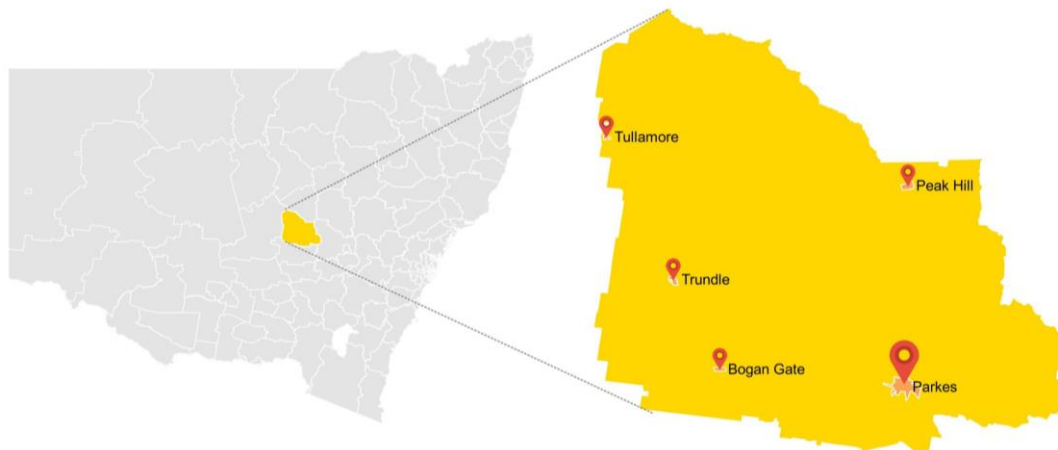
Parkes is an agricultural centre with rich agricultural and grazing land. It is an important contributor to the economy, albeit with lower farm incomes for recent years due to low rainfall. Parkes Shire also has a strong mining sector anchored by the Northparkes Mines copper and gold mine, which is expanding. The transport and freight sector continues to strengthen with the new Parkes National Logistics Hub. Funding has also been committed to the Australian inland rail, with Parkes a key centre on the planned rail corridor between Melbourne to Brisbane and Sydney to Perth rail corridor.

Tourism is important to the local economy, facilitated by its position on the Newell Highway. The 'Dish' – the CSIRO Parkes Radio Telescope located at the Observatory – is a key attraction due to its pivotal role in Apollo 11's moon landing. The Elvis Parkes Festival, held in January, is a premier event bringing 25,000 people annually to Parkes for five days of events.

Parkes is an integral part of the Central West Region. The local government area (LGA) has a close-knit relationship with its neighbour Forbes, seen in an exchange of workers between the two towns and regionally focused business. Parkes and Forbes are considered a twin centre in the Central West and Orana Region Plan.

Drivers of population change

This section provides an overview of key drivers of population change. This provides information on those indicators that need to be monitored during implementation of community and strategic plans.

Population change

Parkes has a relatively stable population since 2001, with a difference of only 480 people between the smallest population in recent years (14,600 in 2006) and the largest (15,080 in 2011). Since the peak in 2011, there have been small declines year on year in terms of population size.

Figure 2: Parkes Shire Council population and growth rates, 2001-2018

Source: Estimated Resident Population, ABS.Stat[Beta]

The data measuring the annual change are based on estimates prepared by the Australian Bureau of Statistics (ABS) for the usual resident population. This is a count of those people living in Parkes for six months or more. Between each Census these numbers are informed by birth and death registration forms, and when people change their address for Medicare. Not included are those people who may be spending significant time in Parkes for work and who retain their main residence elsewhere (e.g. fly-in, fly-out workers, contractors). The population estimates may therefore underestimate service-level populations.

Age profile

A key factor contributing to Parkes future population growth and composition is the ageing of its population.

Over time there has been a decline at all younger ages, except for those people in their early 20s, and among all people over the age of 50. Since the beginning of the 2000s there has been a notable hollowing out of the working age population (see Appendix A).

This has implications for current and future workforce supply, particularly if demand for workers is changing with new infrastructure investment. It also affects housing demand, with older populations more likely to live in single person and couple households, thereby generating demand for more houses compared to younger generations who are more likely to be living with children.

The different growth profiles between the older and younger cohorts in the community is driven by out migration among working age people. This is why the projections presented in this report pay particular attention to the impact of migration.

Figure 3: Number of persons by age and sex, Parkes Shire Council, 2001 and 2016
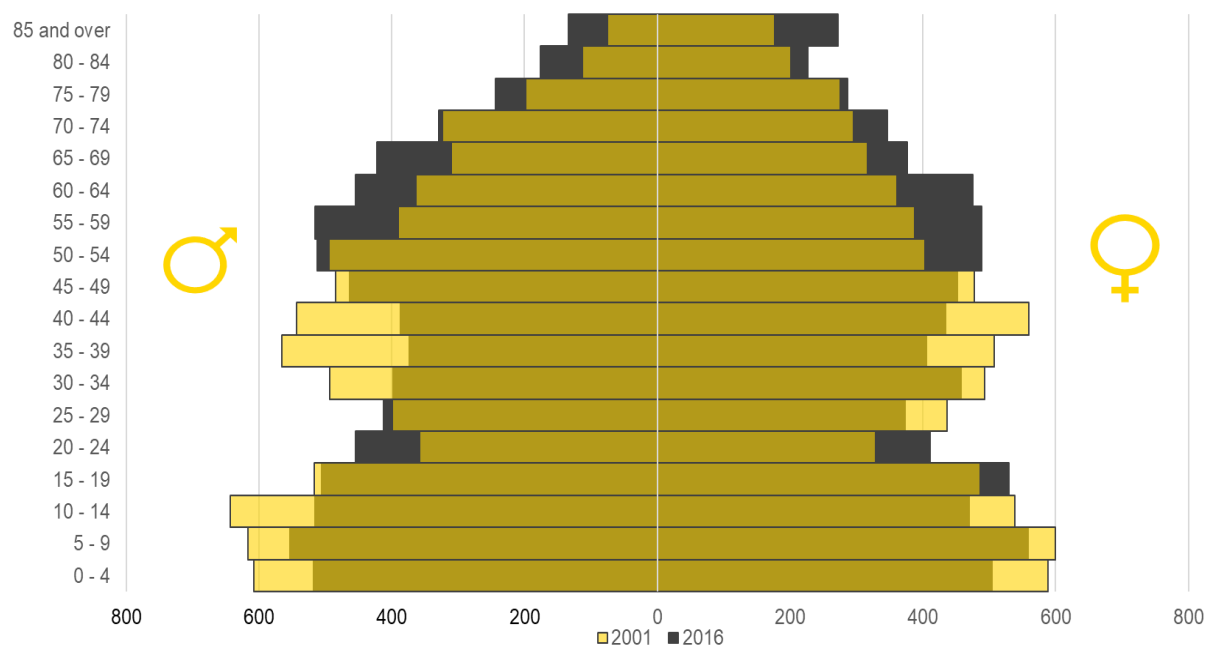
Source: Estimated Resident Population, ABS.Stat^{Beta}

The impact of the declines in the prime working age population is seen in relatively stable youth dependency ratios and increases in aged dependency ratios (Table 1).[1] There are currently one in five people living in Parkes who are aged 65 years and older, up from 15% in 2001.

Understanding these age-based changes is important when looking at the impact of new employment opportunity on the population. Measures such as jobs to population ratios may mask the contribution of population ageing to population growth.

Table 1: Dependency ratios and per cent population at older ages, Parkes Shire Council, 2001-2018 (selected years)

	Dependency ratio[1]		% of population aged	
	Youth	Aged	65+	85+
2001	0.397	0.253	15.3	1.7
2006	0.376	0.269	16.4	2.0
2011	0.377	0.299	17.8	2.5
2016	0.347	0.313	18.9	2.7
2018	0.346	0.322	19.3	2.8

(1) Dependency ratio is number of persons aged 0-14 (youth) or 65 and older (aged) divided by persons aged 15-64 years.
*Source: Estimated Resident Population, ABS.Stat^{Beta}*

Parkes compared to the Region and State

The Central West and Orana Region have experienced slower growth than NSW as a whole since 2001 (whose growth has been driven by Sydney), and Parkes' growth has been slower than the region as whole.

In the early 2000s, when the region's population declined slightly there were greater declines in Parkes. This slower growth in Parkes compared to the region is seen across all ages. These differences highlight the importance of economic development opportunities for Parkes to maintain population growth as a key place to live for people in the region.

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[1] Dependency ratios are summary measures used as a proxy to infer the ratio of persons not in the labour force and those persons at key working ages. While we recognise that age is not an indicator of work force participation and those not in the labour force are not dependents, monitoring changes in this measure is useful for understanding how demand for infrastructure and services may change in response to changing population age profiles.

Figure 4: Five year growth rates, Parkes Shire Council, Central West and Orana Region and NSW, 2001-2016
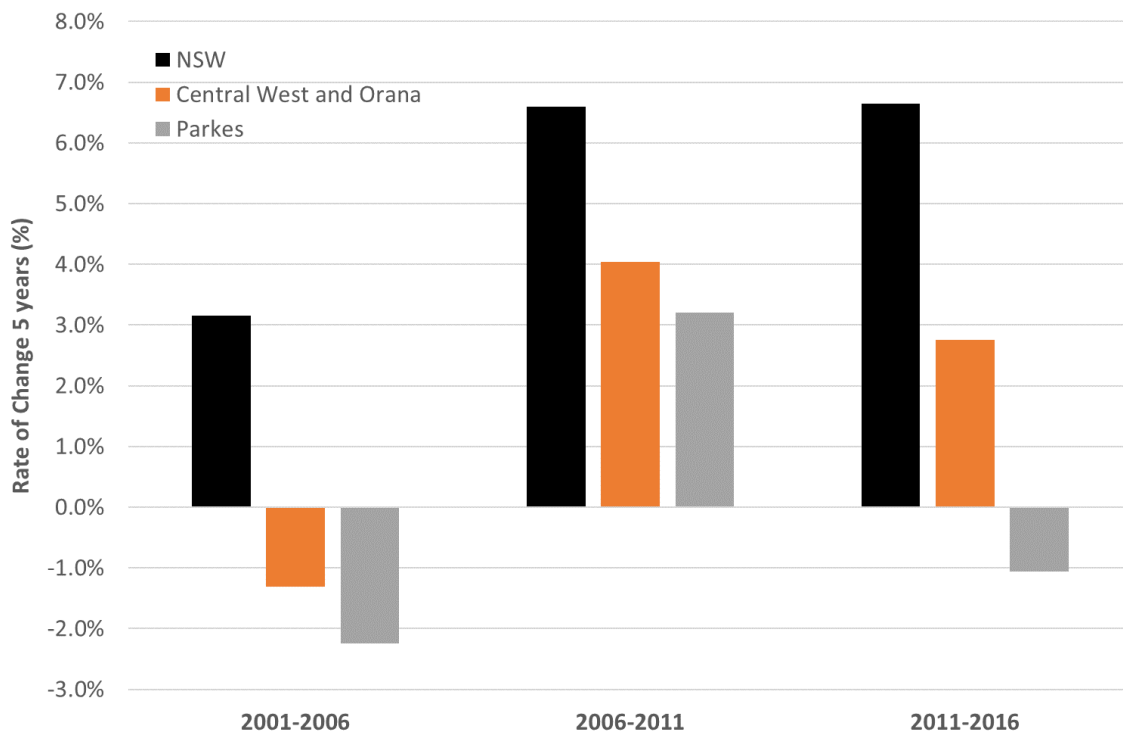
Source: ABS, Census of Population and Housing, various years.

Figure 5: Growth rates by age, Parkes Shire Council, Central West and Orana Region and NSW, 2001-2016
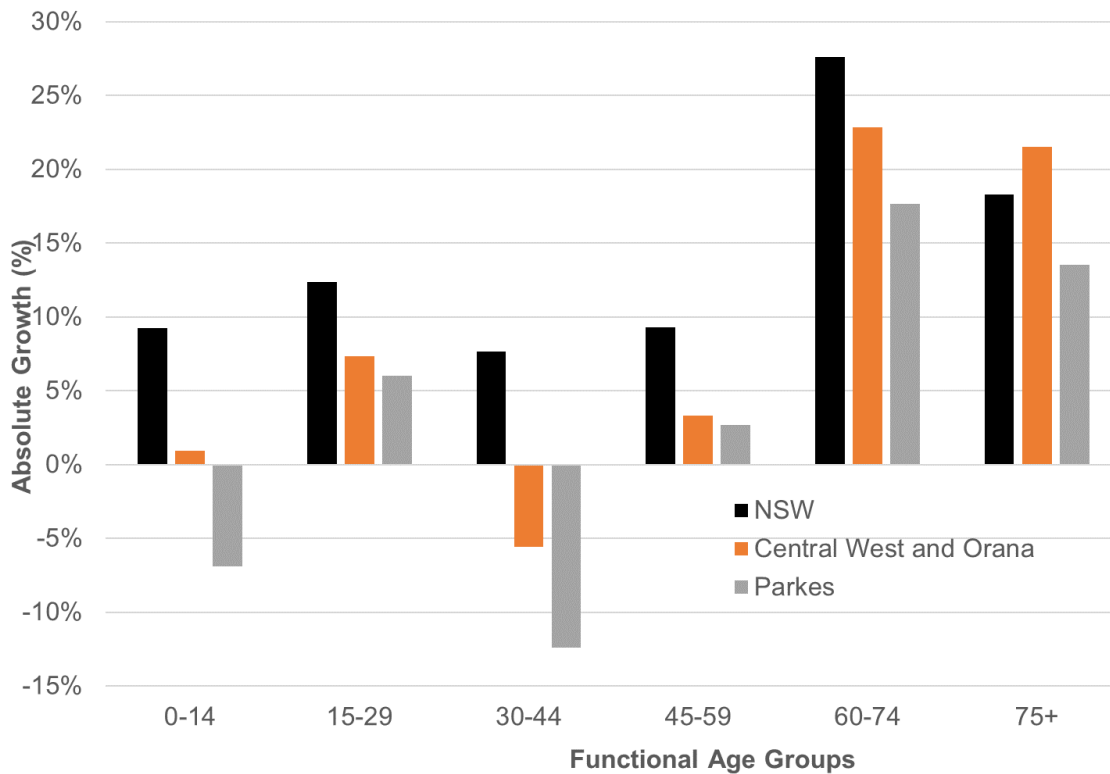
Source: ABS, Census of Population and Housing, various years.

Drivers of change

The internal combustion of population change in any population is driven by natural increase or the balance between births and deaths. Ageing of the Parkes' population means that the balance between births and deaths is likely to contribute to slower growth into the future.

Since 2011 there has been consistent net migration loss in Parkes. That is, more people leaving than arriving to live there (Figure 6). This is predominantly made up of people moving between Parkes and other parts of Australia, but also includes a small number of people arriving from or leaving for countries outside Australia.

Publication of migration estimates at local government level is a relatively new measure published by the ABS and is a useful tool for understanding what is driving change in local communities.[2] What stands out is the significant exchange of people in and out of Parkes indicated by the migration estimates (Figure 7).

As the next section shows, these moves are age specific. Young people leaving are likely to be leaving home and are less likely to create housing supply as parents are left behind. In contrast, the in movement of families (those in their 20s, early 30s with young children) generates housing demand.

Figure 6: Drivers of population growth in Parkes 2006 to 2017
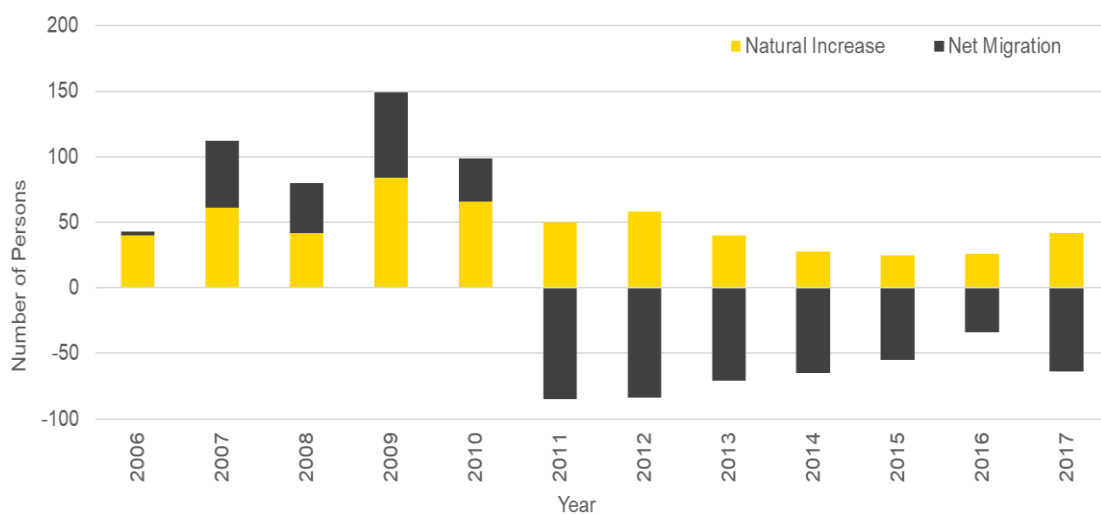
Source: Estimated Resident Population, ABS.Stat^Beta

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[2] Publication of Regional Internal Migration Estimates (RIME) are available from 2006-07, and Regional Overseas Migration Estimates (ROME) are available from 2016-7 onwards. Earlier migration estimates are calculated by measuring the "residual" of population change that cannot be accounted for by published births and deaths.

Figure 7: Drivers of population growth in Parkes 2017-18
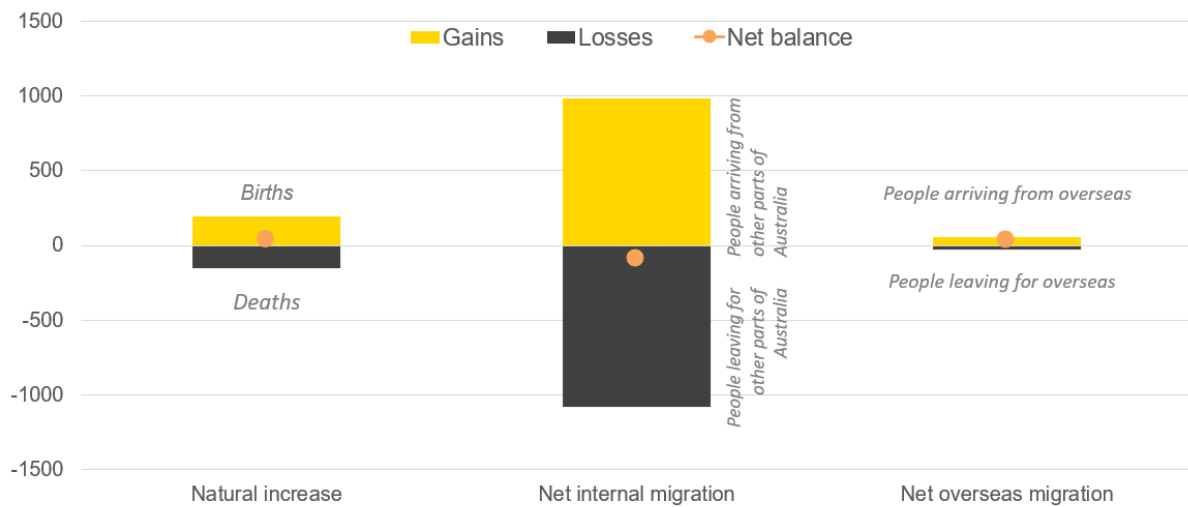
Source: Estimated Resident Population, ABS.Stat^Beta

Migration

There are two aspects of migration that influence population change over time. The volume of people moving in and out of an area (Figure 7 above and Figure 8) and the likelihood that someone is going to make that move (Figure 9). The population projections presented in this report, include assumptions about both volume and likelihood of migration. Census data are the main source of information allowing for analysis by age and sex of population movements.

Most of the movements in and out of Parkes are from within NSW, with neighbouring LGAs of Forbes, Western Plains Regional and Orange key destinations for those leaving, as well as source of people moving in (Table 2).

There is a clear net migration loss for young people in their late teens and early 20s, with in and out flows at older ages matching each other.

Figure 8: Intrastate and Interstate Migration, Parkes Shire Council, 2011-2016
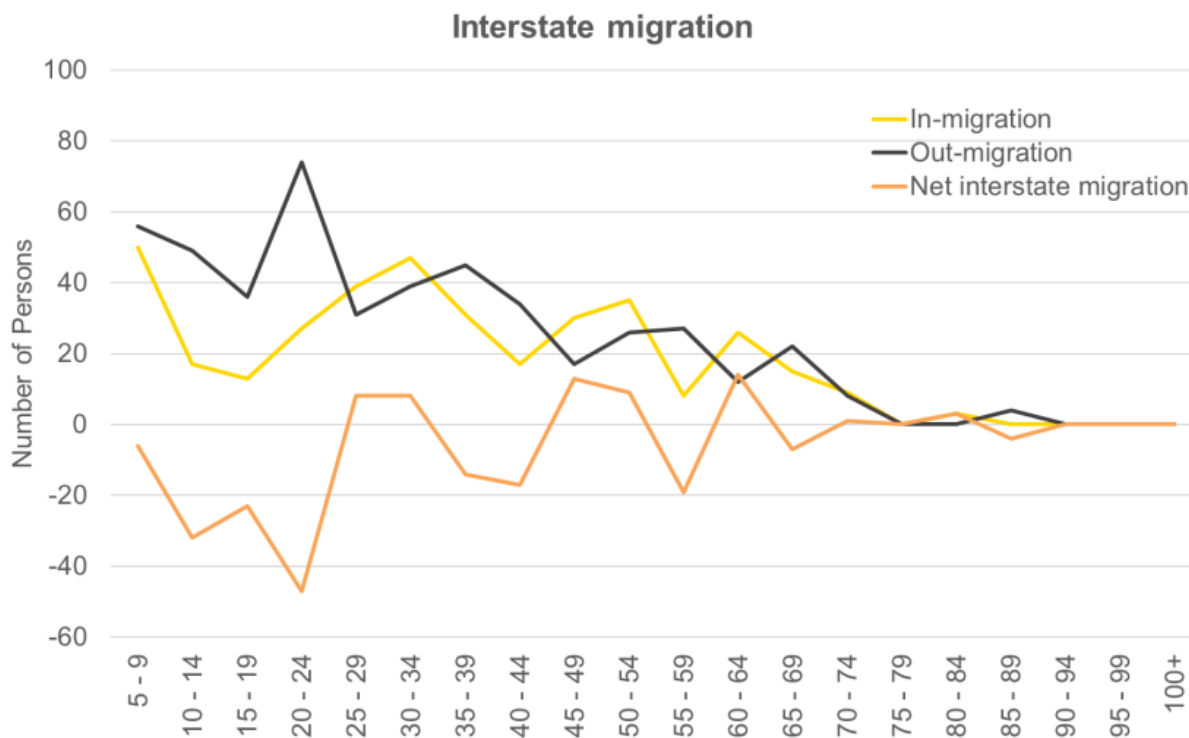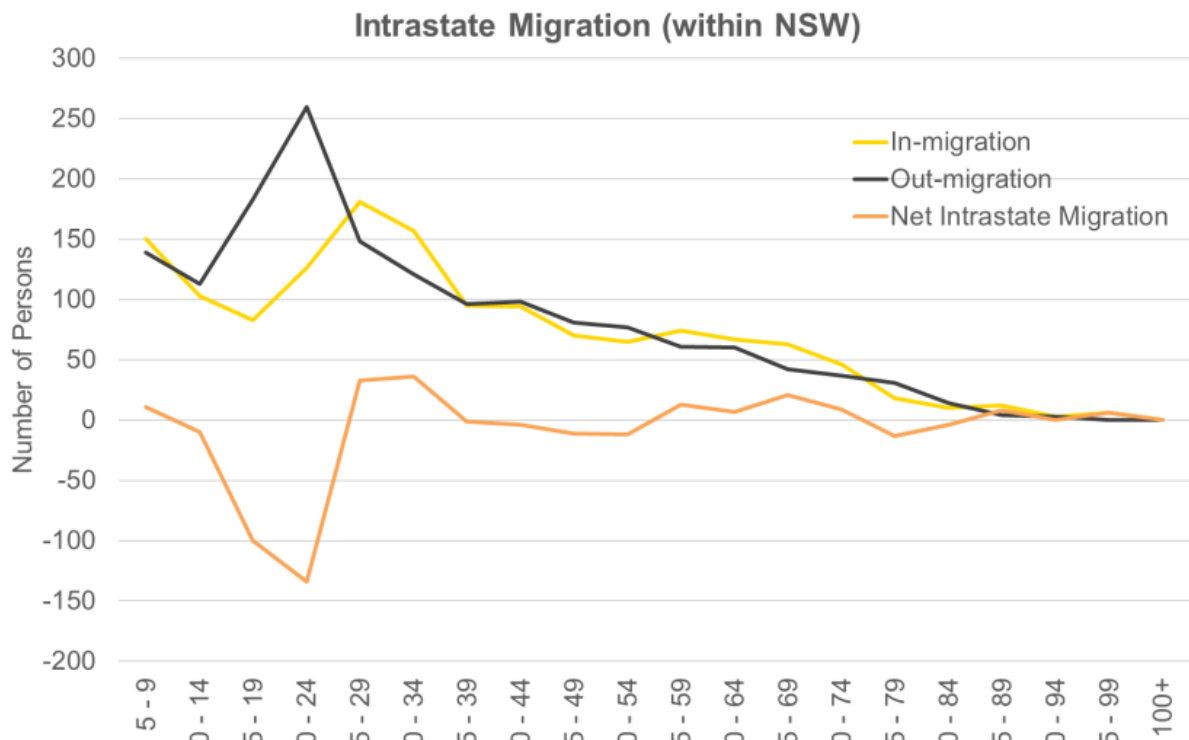*Source: 2016 Census of Population and Housing*

Intrastate Migration (within NSW)

Legend: In-migration, Out-migration, Net Intrastate Migration

Interstate migration

Legend: In-migration, Out-migration, Net interstate migration

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Table 2: Top 10 source and destination LGAs for internal migration to and from Parkes, 2011 to 2016

Top source LGAs		Top destination LGAs	
Forbes	116	Forbes	159
Western Plains Regional	104	Orange	153
State Undefined	81	Western Plains Regional	115
Cabonne	52	Bathurst Regional	84
Lachlan	51	Wollongong	57
Blacktown	48	Central Coast	48
Orange	47	Wagga Wagga	47
Central Coast	42	Maitland	41
Bathurst Regional	35	Newcastle	32
Lake Macquarie	30	Lake Macquarie	30

Source: 2016 Census of Population and Housing

The age profile of migration to and from Parkes is more evident when looking at the probability of moving[3]. People aged 20-24 years are most likely to leave, with 40% of women and 30% of men at these ages likely to move elsewhere.

Among those moving to Parkes, it is those of the ages of young families (parents and primary age children) who are most likely to arrive from elsewhere.

These migration patterns have two key implications:

- The out-flow of people at younger ages perpetuates structural population ageing (the share of people at older ages).
- Workforce supply is reduced as evidenced by the declining population among people in their 30s and 40s since 2001 (Figure 3).

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[3] Out-migration probabilities are calculated by dividing those who lived in Parkes in 2011 but elsewhere in 2016, by all persons living in Parkes in 2011. In-migration probabilities are calculated by dividing all persons who lived in Parkes in 2016 but were living outside Parkes in 2011 by all persons living outside Parkes in 2011. The larger denominator for in-migration probabilities is why the probabilities are much smaller compared to the in-migration probabilities.

Figure 9: Parkes Shire Council, internal migration probabilities by age and sex, 2011 to 2016

Probability of out-migration 2011 to 2016, Parkes to elsewhere in Australia

Probability of in-migration 2011 to 2016, Australia-wide to Parkes
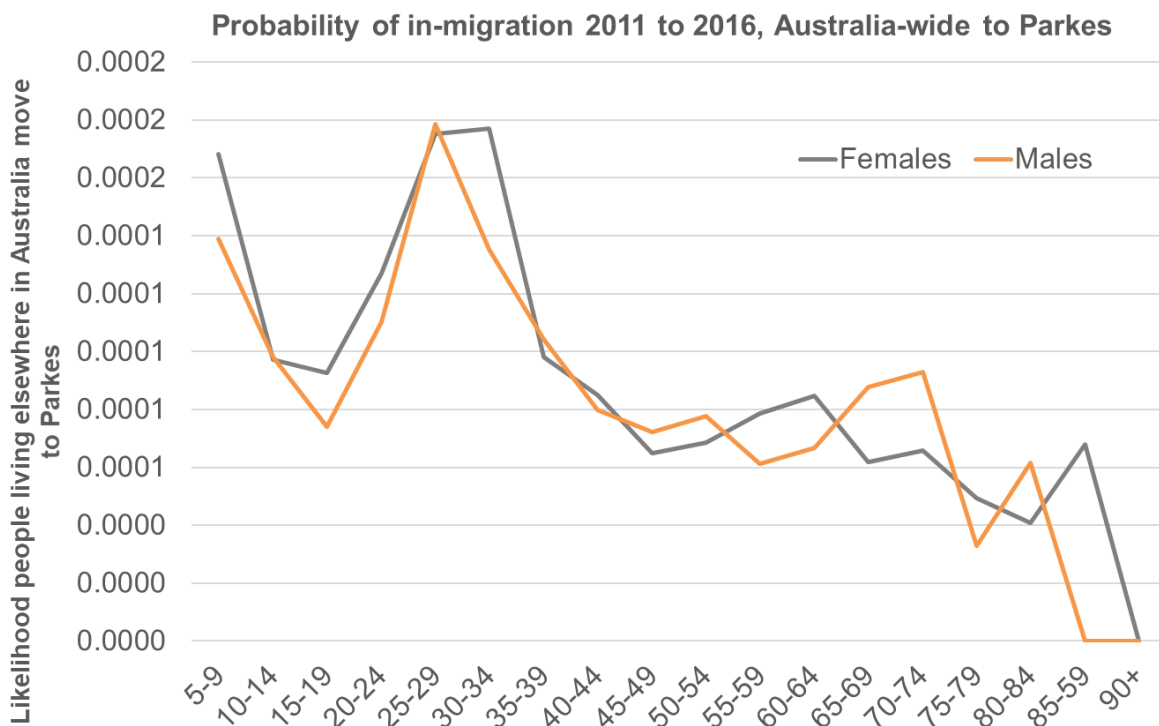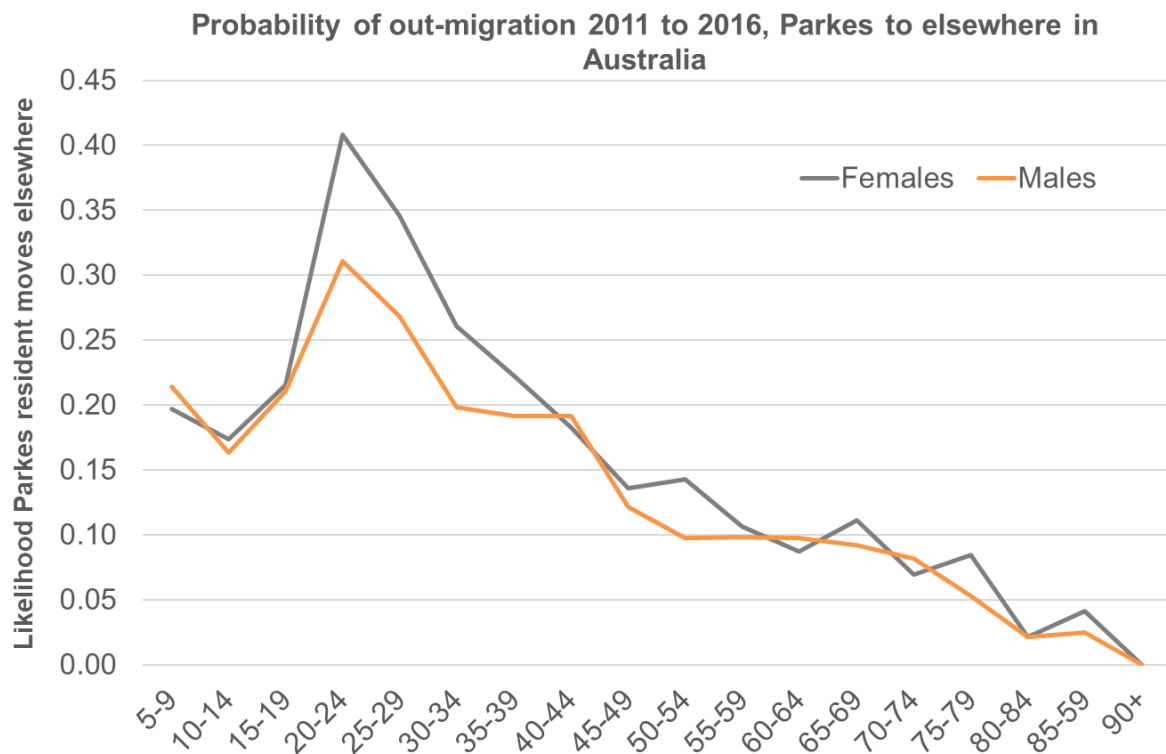
Source: 2016 Census of Population and Housing

Working age population and labour force

The older population age profile is reflected in Parkes' labour force profile. There are more people employed in the mediatric ages (45-64 years) than other age groups (Figure 10).

The labour force participation rate shows the share of the population at each age who are either employed (full time and part time) or unemployed and actively looking for work.[4] The higher participation rate for men at the younger ages is indicative of the smaller base population compared to older ages. The lower participation rate for women shows the impact of caring responsibilities by women (for children, parents and other family members).

Figure 10: Parkes' Shire Council Labour Force
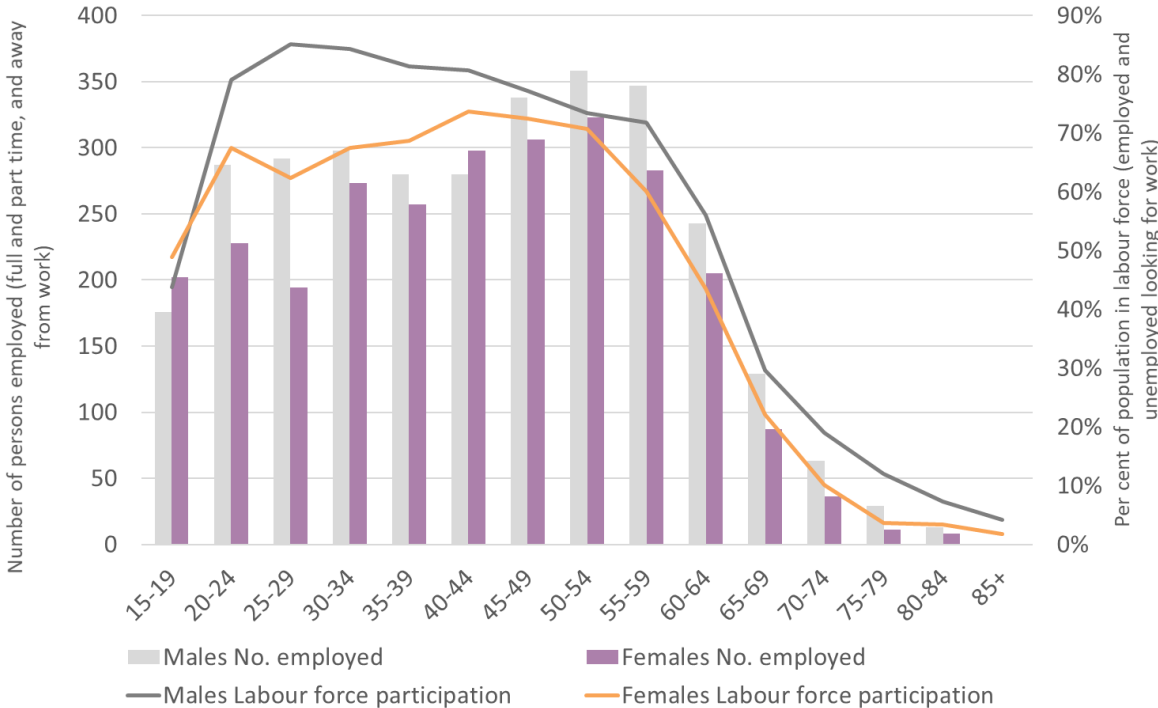
Source: 2016 Census of Population and Housing

This data provides no insights into underemployment (those who have a job but would like more hours) or those who would like to work but have not actively sought a position. Nor do they provide insights into the skills of the labour force. This data does indicate that there is potential supply to fill roles. The low participation rate by women indicates the potential to employ more women, but this could require provision of affordable childcare or aged care, alongside flexile ways of working.

The labour force participation rate age profiles shown by the 2016 Census data have been applied to the population projections detailed in the next section. This shows the impact of the underlying population age profiles, alongside the age profile of Parkes' labour force.

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[4] To be counted as unemployed in the Census a person has to have used at least two methods to look for work in the previous four weeks. A person is counted as employed if they are in paid employment for at least one hour a week.

Household types and the impact of age

The decline in the permanent resident population seen in Parkes since 2011 is reflected in fewer households at the 2016 Census compared to 2011. The only household type that grew was people living alone. This reflects the population ageing that is taking place, with older populations dominated by lone person and couple only households. In 2016, lone person household were the most common type, making up 30% of all households living in private dwellings (Figure 11).

Figure 11: Households by type, Parkes Shire Council, 2011 and 2016
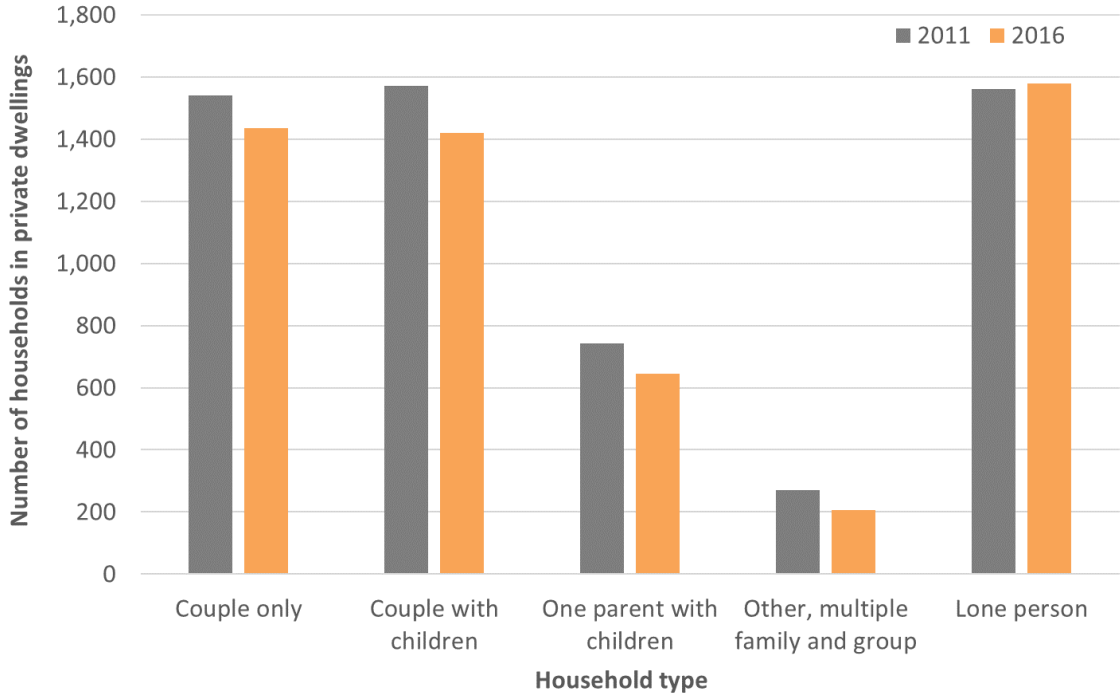
Source: 2011 and 2016 Census of Population and Housing

Among Parkes' residents living in their own home, one-third aged 75-79 lived alone in 2016 and this increased to almost half (46%) of those aged 85 years and older (Figure 12). This high share of the population living alone at older ages has implications for the type of housing that will best meet residents' needs. Parkes' housing stock is made up of stand-alone dwellings with surrounding gardens. More dense housing options with smaller or shared garden space may better meet the needs of an ageing population.

Figure 12: Share of persons living in private dwellings who live alone, Parkes Shire Council, 2016
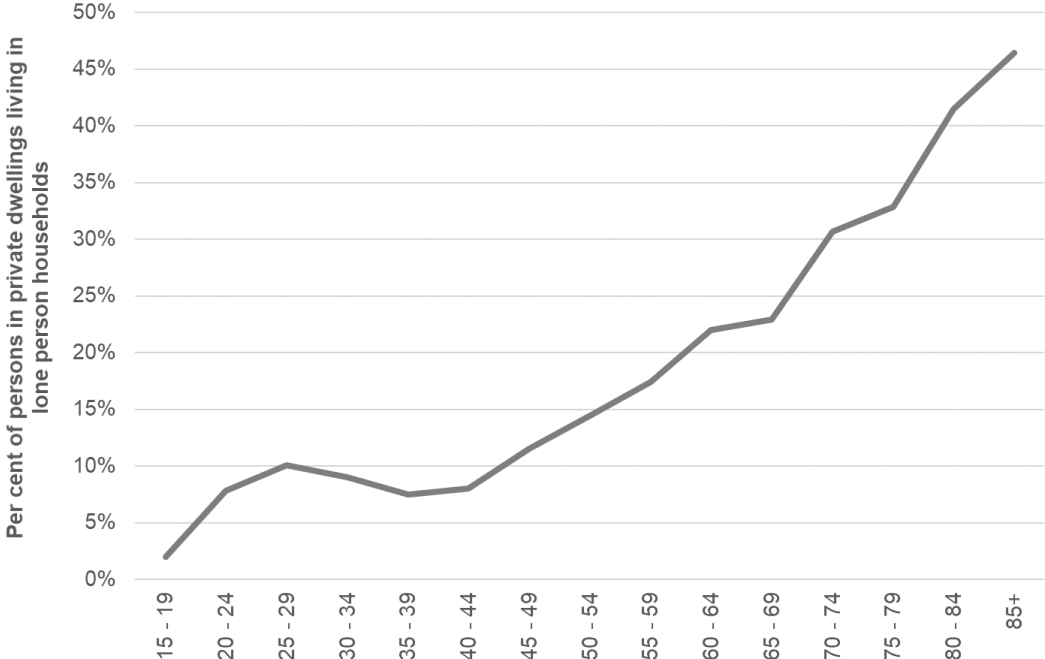
Source: 2016 Census of Population and Housing

The housing propensities shown by the 2016 Census have been applied to the projection outcomes in the next section of this report.

Population Projections

NSW population projections

Updated NSW population projections were released by the NSW Government on 14 December 2019. These forecast a stable population into the future, changing from 14,900 in 2016 to 14,550 by 2041.

The NSW population projections use a multi-regional cohort component model, whereby state, region and LGA assumptions are set, with LGAs constrained to the projection region it sits within, and regions constrained to State totals. In contrast, the projections presented here were developed using a bi-regional model with assumptions set for Parkes with no constraint. The 2019 NSW population projections are informed by the Commonwealth Government budget papers for the short-term, declining to the permanent migration gap thereafter. This introduces a notable decline in net overseas migration (NOM) for all areas in NSW from 2026 onwards. The 2019 NSW population projections assumes fertility will rise.

Unfortunately, the modelling undertaken the NSW Department of Planning and Environment does not take into account recent employment data (post 2016 Census) as well as the potential employment generation from the Parkes National Logistics Hub Special Activation Precinct and other initiatives currently underway.

Baseline projections

Population projections have been prepared by Astrolabe for the Parkes Shire, as an alternative to the NSW population projections 2019.

The projections take into account temporary employment data and possible new employment generating developments at the Parkes National Logistics Hub Special Activation Precinct and other developments in and around the Parkes area.

A bi-regional population projection model[5] has been used whereby the population for the region is projected alongside the rest of Australia. This means in and out migration flows can be modelled allowing for exchanges between the region and the rest of the country.

Headline assumptions have been set (Table 3) and behind each assumption the relevant age profile modelling the likelihood of that event taking place for males and females is included. This includes the likelihood of moving in or out of a region as described in the migration section above, life expectancy at all ages, and an age profile for when women have children.

Baseline assumptions have been informed by recent trends for each of the drivers of population change – births, deaths and migration. Details on how these have been set are detailed in Appendix B.

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[5] Wilson, Tom. (2014). Simplifying Local Area Population and Household Projections with POPART. In Hoque, M.N. and Potter, L., *Emerging Techniques in Applied Demography*. Springer, pp. 25-38. https://www.researchgate.net/publication/279535297_Simplifying_Local_Area_Population_and_Household_Projections_with_POPART

Table 3: Headline assumptions for baseline projection

	2016-21	2021-26	2026-31	2031-36	2036-41
Fertility	2.39	2.30	2.20	2.20	2.20
Male e_0	77.6	78.9	80.1	80.1	80.1
Female e_0	83.8	84.5	85.2	85.2	85.2
NIM assumptions	-46	-46	-46	-46	-46
NOM assumptions	30	30	26	26	26

e_0 = life expectancy at birth, NIM = net internal migration, NOM = net overseas migration

These projections provide the baseline for modelling growth scenarios for the likely impact of the Parkes National Logistics Hub, Special Activation Precinct and other major projects currently taking place in and around Parkes. In these scenarios, migration is the key assumption that has been manipulated to inform outputs.

Several scenarios have been prepared, which are useful for identifying possible futures as monitoring of assumptions is introduced. If migration in flows are higher than assumed, for example, the potential impact can be monitored.

The population projections form the basis for household projections, which inform the number of dwellings needed to accommodate the projected population. For each age group the proportion of the population living in private dwellings is applied to the population by age to give the private household population. Householder proportions by age (the share of people who are the main reference point for a household in the Census) give the number of householders and these are summed for all age groups. The result is the number of households that the projected population with a particular age profile is likely to have in Parkes, if current household formation pattens hold true.

Using the propensity to be in a particular household type among private dwelling residents as measured by the 2016 Census, the projection results also include an estimate of projected households by type.

An additional output from this model is a projected labour force profile by age and sex. These apply the labour force participation rates outlined in the previous section to the projected number of people at each age. These are indicative because an increase in women's participation, for example, could see these numbers increase.

Growth scenarios

Three scenarios have been prepared, and these are detailed below. Information on specific assumptions are shown in Appendix C.

1.	Low Growth - Baseline	Shows stable population with little change to migration
2.	Moderate Growth	Temporary employment increases. Shows higher net migration gains to 2026 (construction phase) returning to historical net migration levels
3.	High Growth	Long-term positive employment generation. Shows high net migration gains to 2026 (construction phase) returning to moderately positive in-migration levels and less out-migration due to increasing attraction of Parkes as a regional centre

There is an established pattern for construction projects, whether it be for building manufacturing plants, mine expansions or new roads, that there are more workers needed during construction than when the project becomes operational. This will certainly be the case in Parkes for the construction projections, with automation in many industries meaning fewer staff needed in the longer term. This means that the moderate and high growth scenarios with higher migration gains in the next five to ten years returning to lower levels are likely. In the longer term, recognising that even in areas with strong regional economies, young people seek to leave for education and other opportunities is taken into account in these projection models.

Across each scenario there is increased demand for housing coming from an increase in the number of households and greater impacts from structural ageing (the share of the population aged 65 years and older). Importantly, there is only an increase in the size of the labour force under the baseline and high growth scenarios (Table 4).

Table 4: Projection scenario outputs

	Population	% 65+ years	Households	No. persons in labour force
Jump-off year 2016	14,924	19	5,984	6,469
Projection as at 2041				
1. Baseline – Low growth scenario	14,961	25	6,290	6,219
2. Moderate growth scenario	16,141	24	6,741	6,751
3. High growth scenario	17,764	23	7,345	7,488

Looking at the projected changes over time in these scenarios, the longer term growth for Parkes' population is likely to be affected by migration levels after the likely in-movement of people to work on the range of projects currently underway (Figure 13). Each scenario has a different impact on age, with the older population growing under all scenarios (Figure 14).

The following pages outline a detailed description of the likely outcome for each scenario.

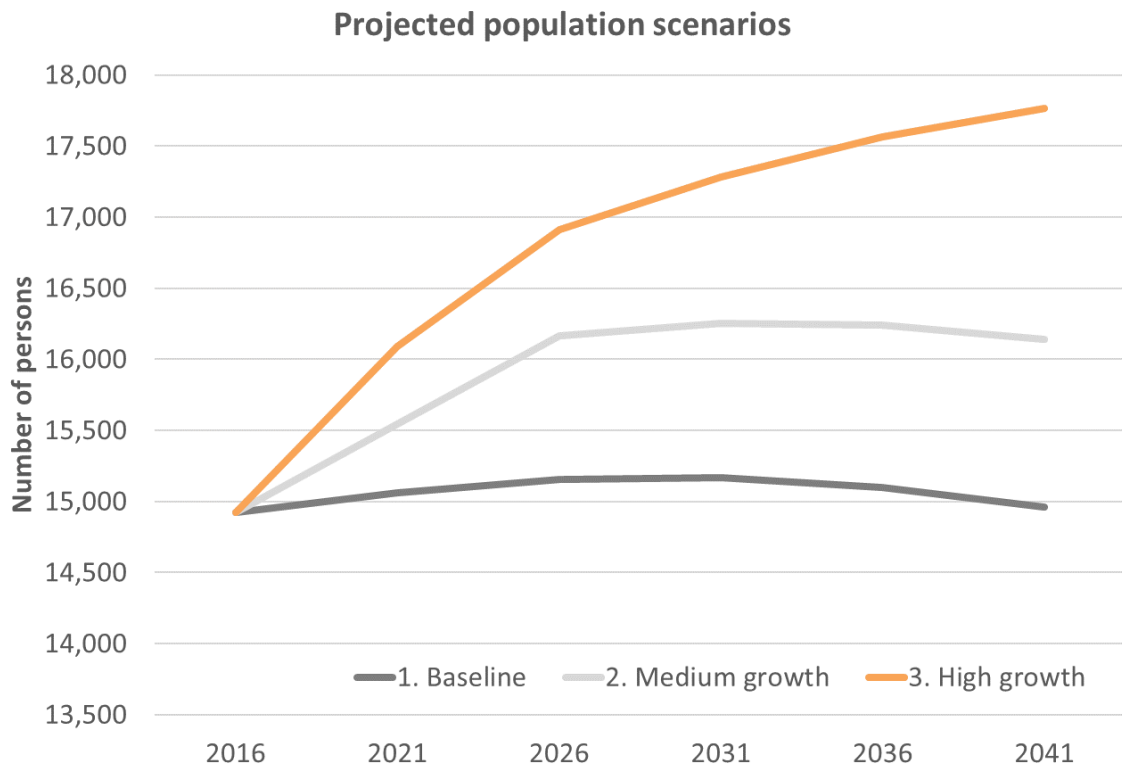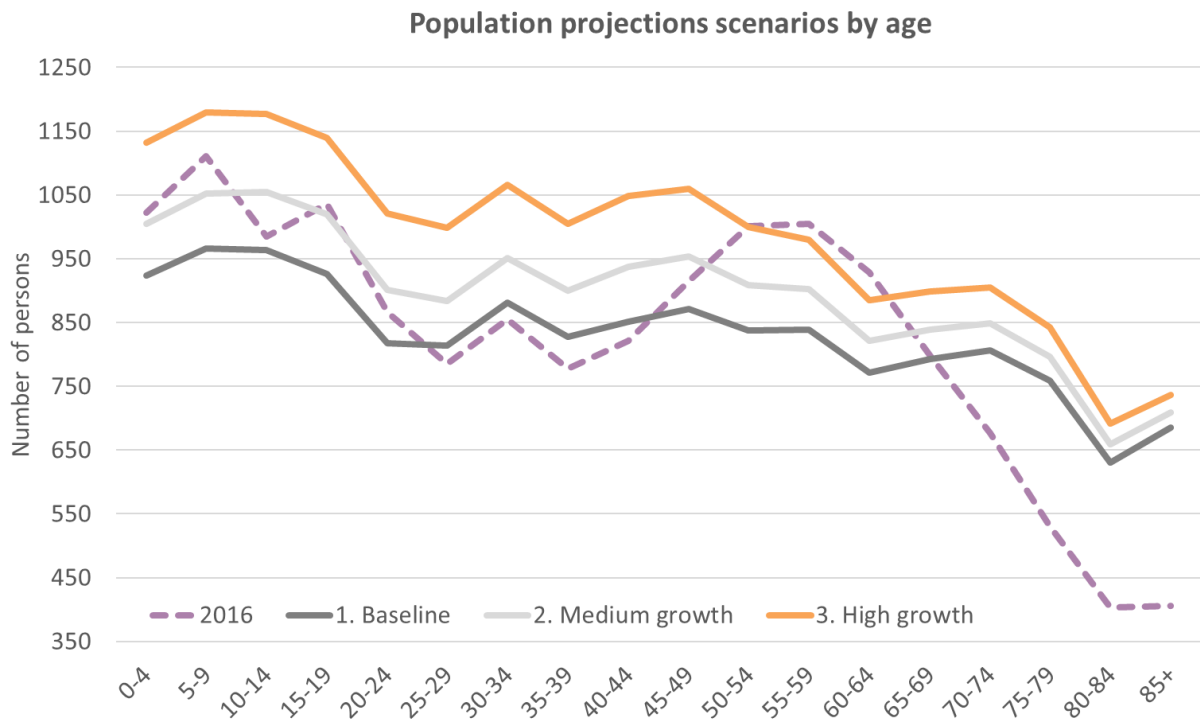*Figure 13: Projected population growth over time, 2016 to 2041*

Projected population scenarios

Figure 14: Projected population by age, 2016 and 2041

Population projections scenarios by age

Low Growth Scenario – Baseline

The baseline population projections assume continued historical patterns for births, deaths and migration into the future, albeit with lower propensity to move out to other parts of Australia compared to historical levels. This assumption is predicated on the new workforce largely being external to Parkes.

Under this scenario, the Parkes population stays about the same size into the future, the number of households increases (a function of population ageing), and the labour force contracts slightly (Table 5).

Table 5: Low Growth Scenario Projection Outputs

	2016	2021	2026	2031	2036	2041
Population	14,924	15,060	15,153	15,169	15,101	14,961
Labour force	6,469	6,416	6,365	6,306	6,259	6,219
Households	5,984	6,095	6,182	6,265	6,296	6,290

Two factors are important under this scenario:

1. The changing age profile with a bigger number of older people, and a bigger share of the population at those ages (Figure 15). Ageing is one of the factors contributing to the rising number of households, driven by older people living alone or in couple only households (Table 6).
2. Population ageing is also contributing to the declining numbers of people in the labour force. With the increased demand for workers arising from the new investment in Parkes, this scenario would see demand for employees met by:

- Greater participation in the workforce from those not employed. This includes greater participation among women, which would require availability of early childcare and out of hours school care.
- Movement of people currently employed in other industries to the new opportunities arising. Given the impact of the drought on incomes from farming and related employment, there is potential for employment demand to be met in this way.
- Employment demand met by temporary workers employed as contractors. This would see greater demand on housing in the Parkes Shire.

Table 6: Projected households by type (low growth scenario)

	2016	2021	2026	2031	2036	2041
Couple only	1,626	1,656	1,679	1,702	1,710	1,709
Couple with children	1,609	1,639	1,662	1,684	1,693	1,691
One parent	729	743	753	763	767	766
Other[1]	233	238	241	244	245	245
Lone person	1,787	1,821	1,847	1,872	1,881	1,879

(1) Includes other family, multiple family and group households.

Figure 15: Projected population by age, 2016 and 2041 (Low growth scenario)
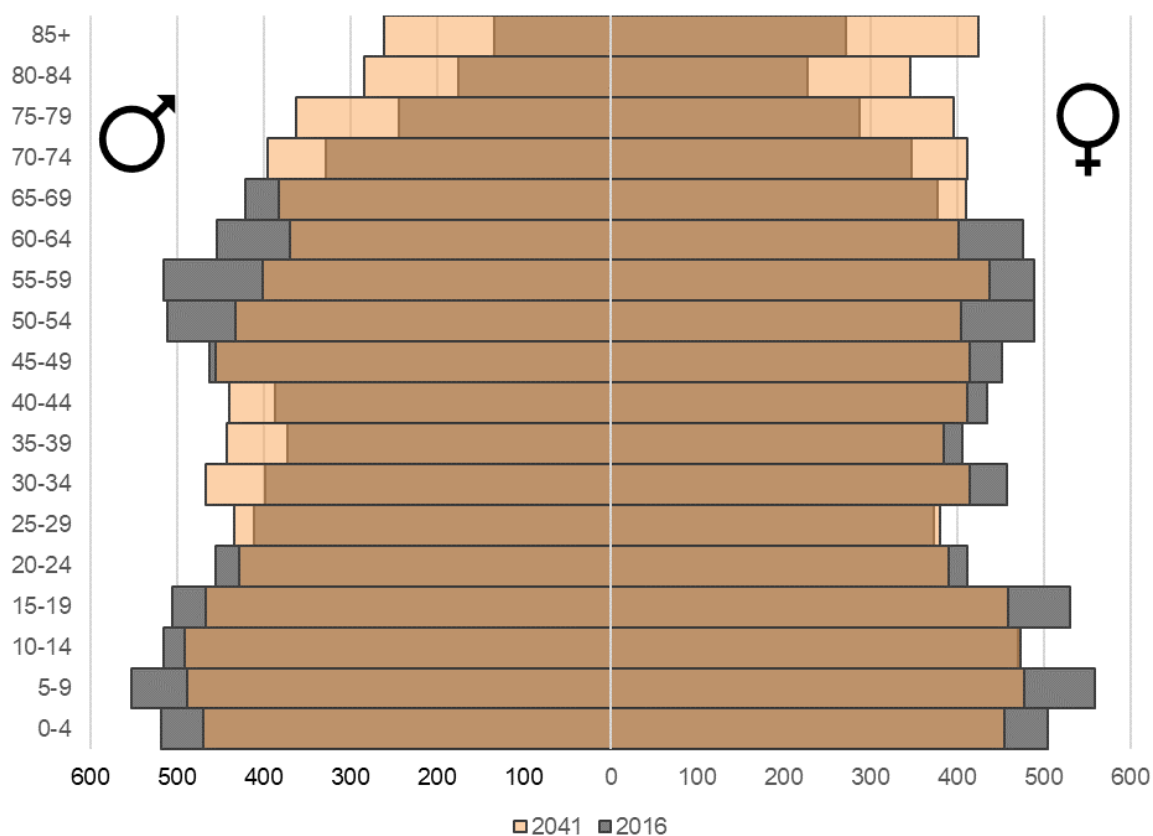
Implications for Parkes LSPS:

- Monitor usual resident population against published estimated residential population (ERP) data. If growth is disproportionate to change in other indicators such as water use and vacancy rates, planning needs to include consideration of delivering enough housing and other infrastructure
- Plan for extra housing to meet the needs of the ageing population. For consideration is the use of universal design to meet changing needs through the life course, different dwelling types and greater density to facilitate service and infrastructure delivery.
- Population growth of this pace could struggle to support human resource intensive industries in the longer term, including manufacturing. Employers into the future will need to be proactive in seeking employees and supporting training of the required skillsets.

Medium Growth Scenario

The medium growth scenario assumes continued historical patterns for births and deaths, and a lower propensity to move to other parts of Australia. It assumes a doubling of net internal migration gains during the construction phase of the infrastructure projects returning to historical levels of net loss thereafter.

This scenario assumes some people will move to Parkes during the construction phase but not necessarily stay as permanent residents, and that the new infrastructure will only be a moderate drawcard for employment. Under this scenario, the Parkes population grows steadily to 2031 and stabilises at just over 16,000 usual residents and the labour force grows slightly over the period. The population growth translates to almost 1,000 more households (Table 7).

Table 7: Moderate Growth Scenario Projection Outputs

	2016	2021	2026	2031	2036	2041
Population	14,924	15,545	16,164	16,252	16,239	16,141
Labour force	6,469	6,641	6,822	6,783	6,764	6,751
Households	5,984	6,261	6,533	6,652	6,716	6,741

Under this scenario, population ageing remains a critical factor that Parkes needs to plan for, but this is mitigated by the higher migration driven by the infrastructure projects taking place (Figure 16). There is notable growth in lone person and couple only households, as well as households with children in them (Table 8). The growth in the labour force is still relatively small, however, and meeting the demand for workers on the new projects would still rely on increased use of those not in the labour force, transfer of employed person between jobs, and use of temporary workers.

Table 8: Projected households by type (medium growth scenario)

	2016	2021	2026	2031	2036	2041
Couple only	1,626	1,701	1,775	1,807	1,824	1,831
Couple with children	1,609	1,683	1,756	1,788	1,805	1,812
One parent	729	763	796	810	818	821
Other[1]	233	244	255	259	262	263
Lone person	1,787	1,870	1,951	1,987	2,006	2,014

(1) Includes other family, multiple family and group households.

Figure 16: Projected population by age, 2016 and 2041 (Medium growth scenario)
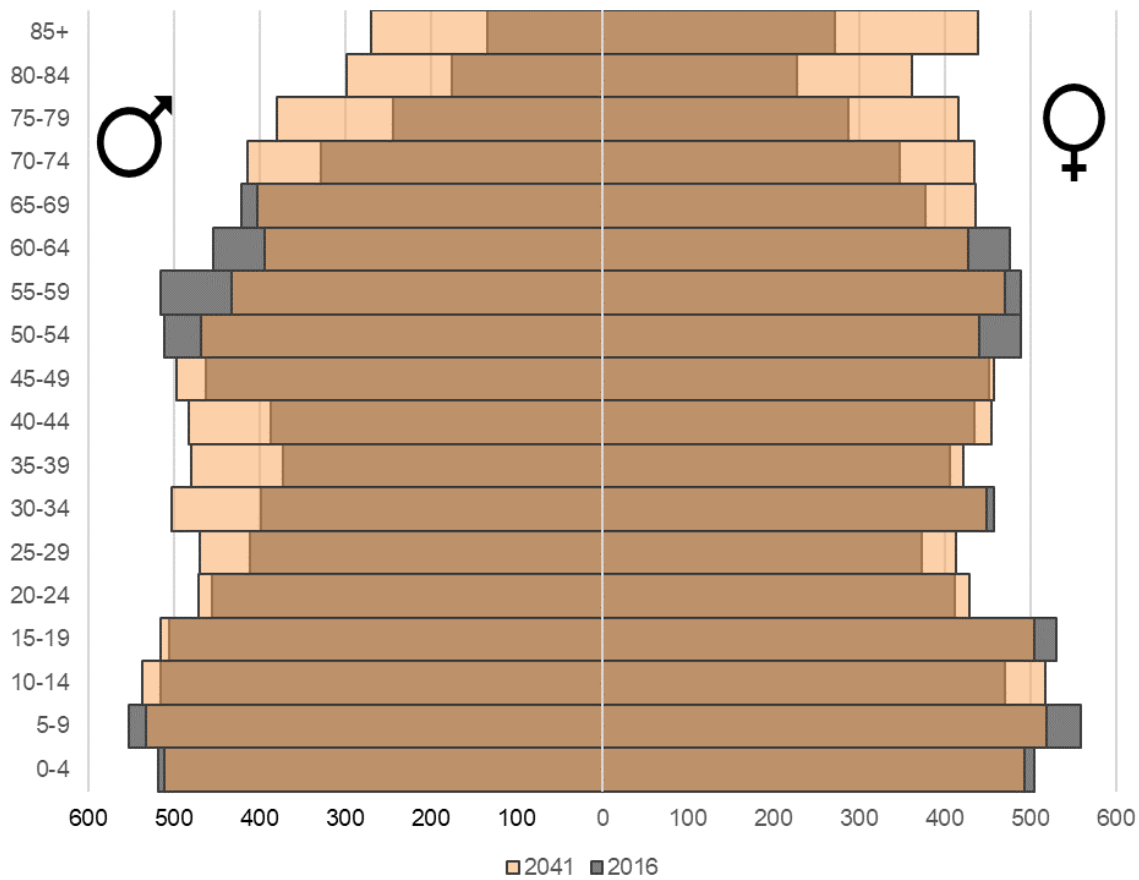
Implications for Parkes LSPS:

- Monitor usual resident population and migration data to determine if growth is in line with the projection or exceeding it. Monitor other indicators of population growth (water use and vacancy rates) to assess the extent of the temporary population.
- While outside workers may be needed for some parts of the construction phase, this scenario shows a population that is able to support new industry, recognising the likelihood of highly mechanised processes. In this regard it will be important to maintain TAFE and other education and training services.
- Housing and services will be needed for the growth in older persons.

High Growth Scenarios

The high growth scenario assumes significant change to net internal migration levels, with high net gains during construction trending to stable neutral levels thereafter with arrival and departures balancing each other out.

This scenario assumes people moving to live in Parkes for construction jobs, and that the resultant infrastructure creates a new employment market that will stop the net migration losses that Parkes has seen historically. Under this scenario, the Parkes population grows to over 17,500 people and the labour force grows by 1,000 more workers. This also means notable growth in the number of households (Table 9).

Table 9: High Growth Scenario Projection Outputs

	2016	2021	2026	2031	2036	2041
Population	14,924	16,092	16,911	17,284	17,562	17,764
Labour force	6,469	6,894	7,155	7,242	7,360	7,488
Households	5,984	6,449	6,793	7,019	7,197	7,345

Under this scenario, all age groups grow, except for those in their 50s and 60s, reflecting the current relatively smaller age cohorts of people in their 20s to 40s. This scenario also sees smaller impacts of structural population ageing (the proportion of the population at older ages), but the number of people at the oldest ages will continue to grow rapidly. There is continued growth in all household types (Table 10).

Table 10: Projected households by type (medium growth scenario)

	2016	2021	2026	2031	2036	2041
Couple only	1,626	1,701	1,775	1,807	1,824	1,831
Couple with children	1,609	1,683	1,756	1,788	1,805	1,812
One parent	729	763	796	810	818	821
Other[1]	233	244	255	259	262	263
Lone person	1,787	1,870	1,951	1,987	2,006	2,014

(1) Includes other family, multiple family and group households.

The growth in the labour force is substantial under this scenario over the period as a whole. This indicates supply of workers of new employment opportunities and assumes an adequate supply for the larger population.

Figure 17: Projected population by age, 2016 and 2041 (High growth scenario)
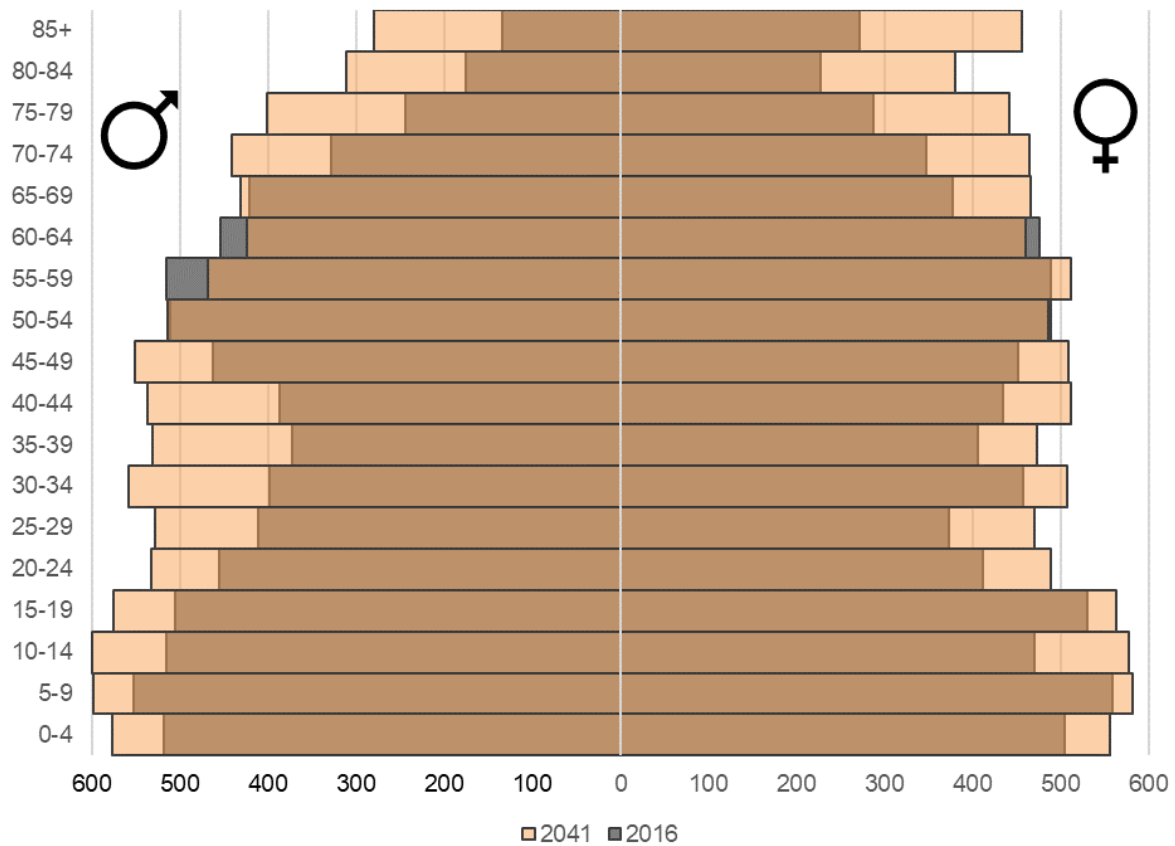
Implications for Parkes LSPS:

- This scenario assumes notable growth that would require planning for over 1,000 new dwellings by 2041 to accommodate the growth in households. Given the proximity of Forbes allowing for relatively short commute times, understanding Forbes Shire Council's plans for housing supply is an important part of long-term planning.

- The growth is cumulative over time so even with high growth in the early period, with potential growth in the labour force of 400 by 2021, there could be a shortage of workers for specific phases of construction or for particular skills. With a relatively smaller gap between demand and supply in this scenario, supporting greater labour force participation by those currently not in the labour force and movement of staff between industries and occupations could meet demand.

- Monitoring population indicators is critical to understand if this growth trajectory is being realised or not. If high levels of growth for usual residents are driven by the construction of new infrastructure, it is important to monitor if any downturn follows.

Monitoring Temporary Populations

No direct quantitative data are available to measure temporary populations – those people not living in a place for six months or more as measured by the estimated resident population. We have analysed various potential indicators to assess how they might be used by Parkes Shire Council to measure temporary residents, particularly those in Parkes for work.

Daily water use

Data from Parkes Shire Council on daily water use from February 2018 shows that over the past two years there has been an increase in daily kilolitres water use. The spike in water use in January 2019 and 2020 is a clear link with the Elvis Festival, and shows that changes in water use are correlated with visitors.

What is striking is that the upward trend coincides with a period of drought when residents are conservative in their water use and per capita water use can reasonably be expected to be going down.

Figure 18: Daily water use and trend line, February 2018 to January 2020
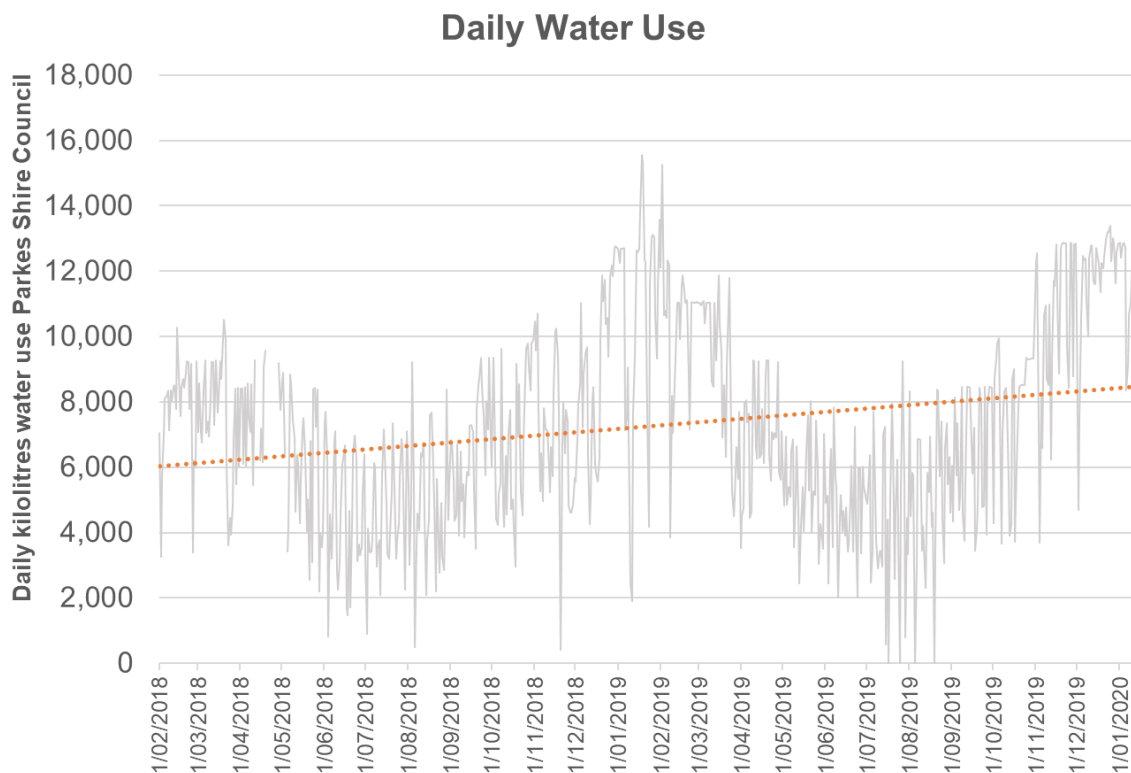
Source: Unpublished data, Parkes Shire Council

However, the water data do not allow estimates of the <u>number</u> of temporary visitors. The data is useful, however, in allowing trends for water use to be compared to changes in the usual resident population. The estimated resident population for Parkes has been declining year on year to 30 June 2018. The upward trend shown in the water data shows it will be a useful indicator of population demand on resources, even if the usual resident population remains steady.[6]

Airline passengers

Unpublished data provided to Parkes Shire Council from Regional Express Airlines (Rex) shows there is a very strong relationship between the pattern of year on year change in passenger numbers and the working age usual resident population in Parkes. This indicates that passenger data may be a useful early indicator of population growth.

Figure 19: Comparison of changes to Rex passengers arriving in Parkes and the Parkes usual resident working age population, 2002-2018
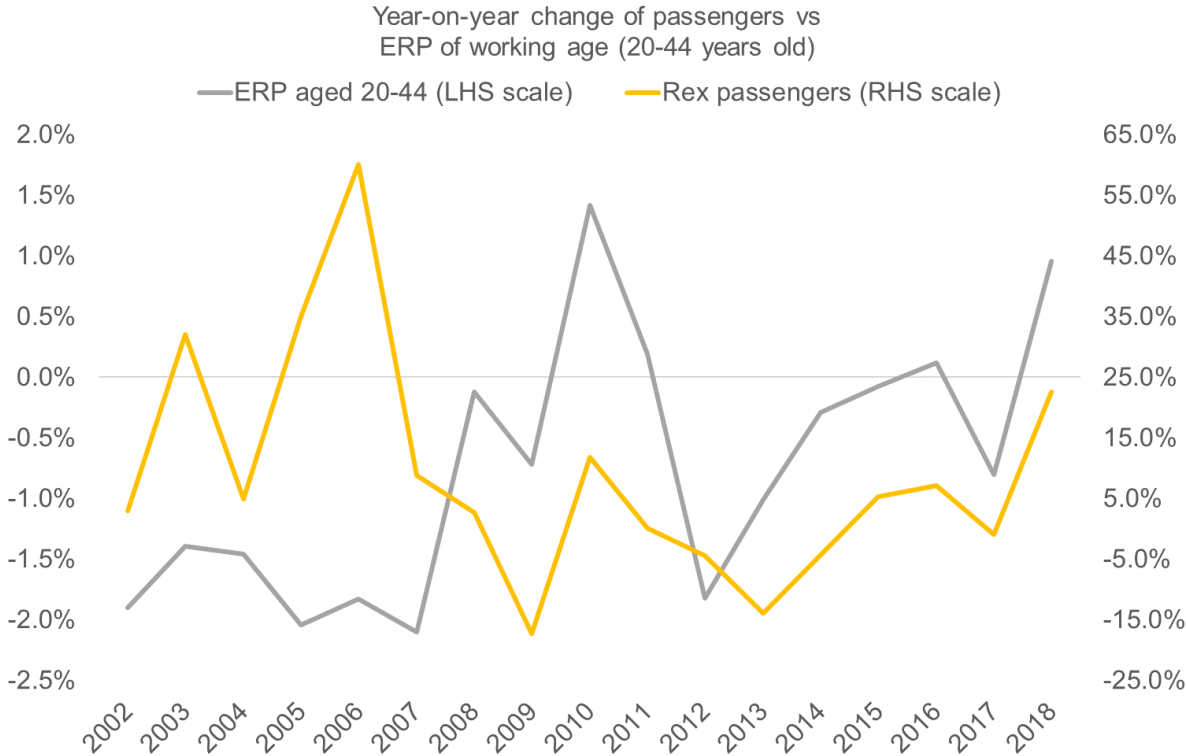
Source: Unpublished data, Rex. passenger data.

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[6] We explored estimating population numbers from average daily water use information, but the results indicated insufficient data to deliver reasonable results (some calculations indicated over 2,000L daily use per person, well above any averages published for Australia).

If a regular pipeline of Rex passenger data is available to Council, the monthly data could be used to predict changes in the usual resident population ahead of the publication of ERPs, which are only released on an annual basis (2019 ERPs are due for release in March 2020). Due to the cyclical nature of the monthly passenger data, it would be ideal to track change on a rolling 12-month basis.

During the decline in population and passengers starting in 2010, the trough of passengers occurred after the trough in population. This suggests that the relationship here is two-way. For example, more passengers coming to Parkes can add to its population. However, once a population is in decline, it can lead to fewer visitors too. This indicates that the data will be a useful early indicator of population change after the construction period is completed.

Prior to 2001 (not shown) an opposite pattern was seen where an increase of passengers correlated with a loss of working age population in Parkes. While this could be a data effect related to how data were collected, it could also indicate the impact of fly in fly out workers for the Northparkes Mines construction in the 1990s.

The passenger data are therefore an important indicator of change in the Parkes population and provides insights into whether there is greater demand on infrastructure than suggested by usual resident population data. However, as with the water data, it is difficult to forecast numbers of temporary residents for the Shire.

Visitors to Parkes

Image: Parkes Elvis Festival, Source: *www.parkes.nsw.gov.au*

Information on visitor nights to Parkes are available from Tourism Research Australia (TRA) annual visitor surveys. Data reported via the economy.id profile for Parkes Shire Council,[7] the method for estimating local council numbers from survey data is not clear but the similarity in data lines between the ERPs and visitor nights, particularly from 2015 onwards indicate ERPs inform the estimation.

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[7] Parkes Shire Tourism visitor summary, https://economy.id.com.au/parkes/tourism-visitor-summary.

Figure 20: Comparison of changes to domestic visitor nights in Parkes and the Parkes usual resident population

Year-on-year change
Total domestic visitor nights vs ERP

ERP All ages (LHS scale) Domestic visitor nights (RHS scale)
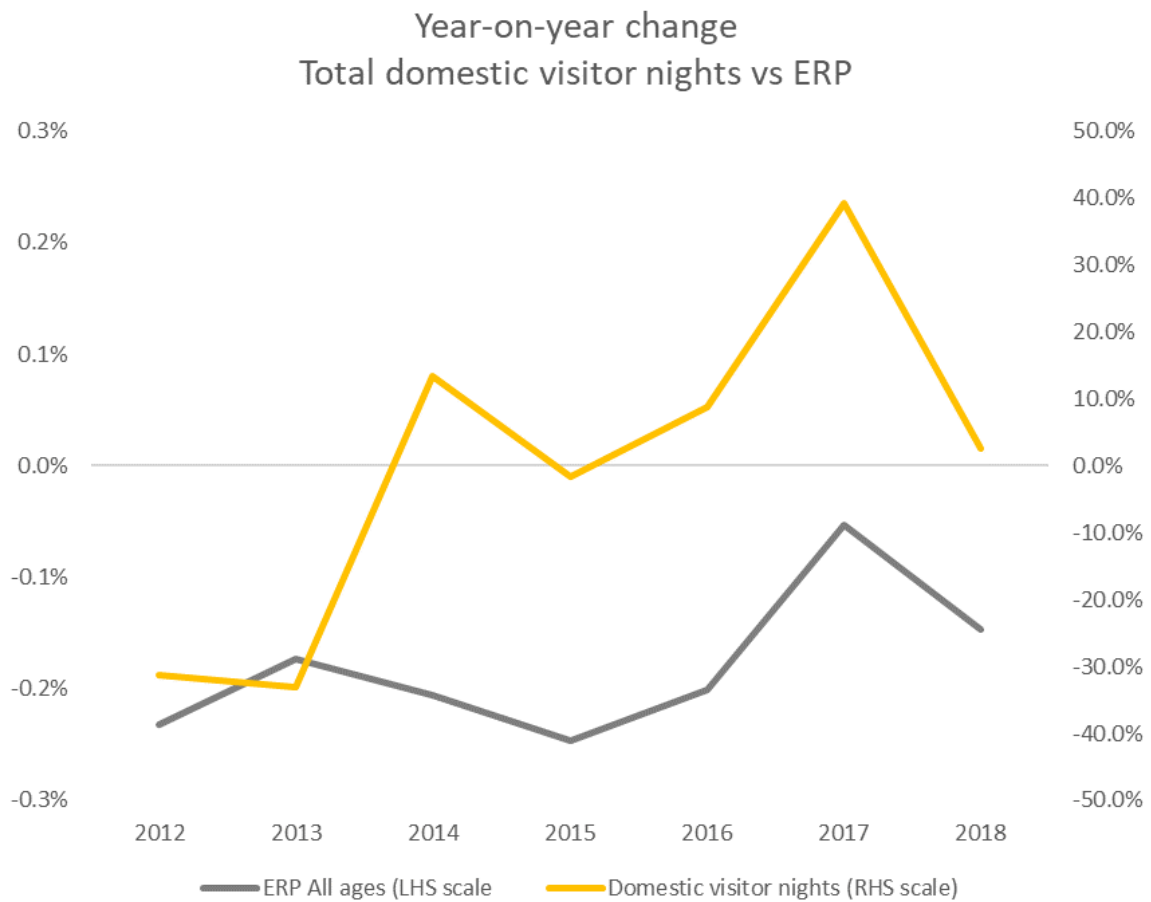
Source: Tourism Research Australia via economy.id.

Because the tourism data are estimated from a survey, not released live (e.g. the most recent data are for 2018) and the changes are based on relatively small numbers, this does not appear a useful data source to understand temporary populations.

More useful, would be more regular updates from tourist accommodation in the council area on vacancies. For example, number of beds per months. A small survey in December 2019 carried out by Parkes Shire Council found among 10 respondents that all had over 50-75% occupancy rates, four had 75-90% occupancy and one had 90% and over occupancy. The survey also found that among those staying in tourist accommodation only 14% of people were tourists. Over half (56%) were contractors and 30% were professionals.

Such data could be used to inform estimated number of temporary workers in Parkes and set a baseline for monitoring changes over time. There are 1,241 bed spaces available in Parkes itself and a further 202 elsewhere in the Shire).[8]

Applying the results from the small survey allow development of a method to estimate number of temporary workers in Parkes, as shown below:

Apply occupancy distribution to number of bed spaces:

50% had 50-75% occupancy = 621 total beds spaces

40% had 75-90% occupancy = 496 bed spaces

10% had 90-100% occupancy = 124 bed spaces.

Assume lower end of occupancy applies to all bed spaces*:*

50% occupancy of 621 bed spaces = 310 bed spaces

75% occupancy of 496 bed spaces = 372 bed spaces

90% of 124 bed spaces = 112 bed spaces.

This gives an estimate of 794 occupied bed spaces in Parkes in December 2019. Assuming 56% are contractors gives an estimated temporary population of 445 persons.

Collecting regular data from local hotels, and working to improve the response rate, would allow continued estimates to monitor change, as well as provide a time series on which to establish trends for forecasting. Data from powered caravan sites could provide other information.

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[8] *Parkes Region Visitor Guide*, p. 27 https://visitparkes.com.au/destination-guide/ (accessed 20 December 2019). In addition to bed spaces there are powered and unpowered sites available in caravan parks in Parkes, Peak Hill, Trundle and Tullamore.

Employment data

Unpublished data provided by Inland Rail to Parkes Shire Council showed that as of October 2019 648 local residents have worked on the project (including local Indigenous residents). Summary workforce data for the project show a total of 788 people in the workforce, 230 of whom are categorised as "other" (that is not local or Indigenous). Given the average workforce is 291 (and the peak workforce was 485 in October), the data in the format provided don't give a breakdown of workers from outside Parkes over time.

The 'other' category makes up 29% of the total workforce numbers shown. If we assume this is relatively constant over time, this would mean about 85 workers of the average workforce are not local. There may also be non-local Indigenous workers. Detailed data on a month by month basis, including any forward estimates, from major projects taking place in Parkes, gives the most reliable estimates of the temporary population and thus the demand on accommodation and other infrastructure.

POPULATION FRAMEWORK
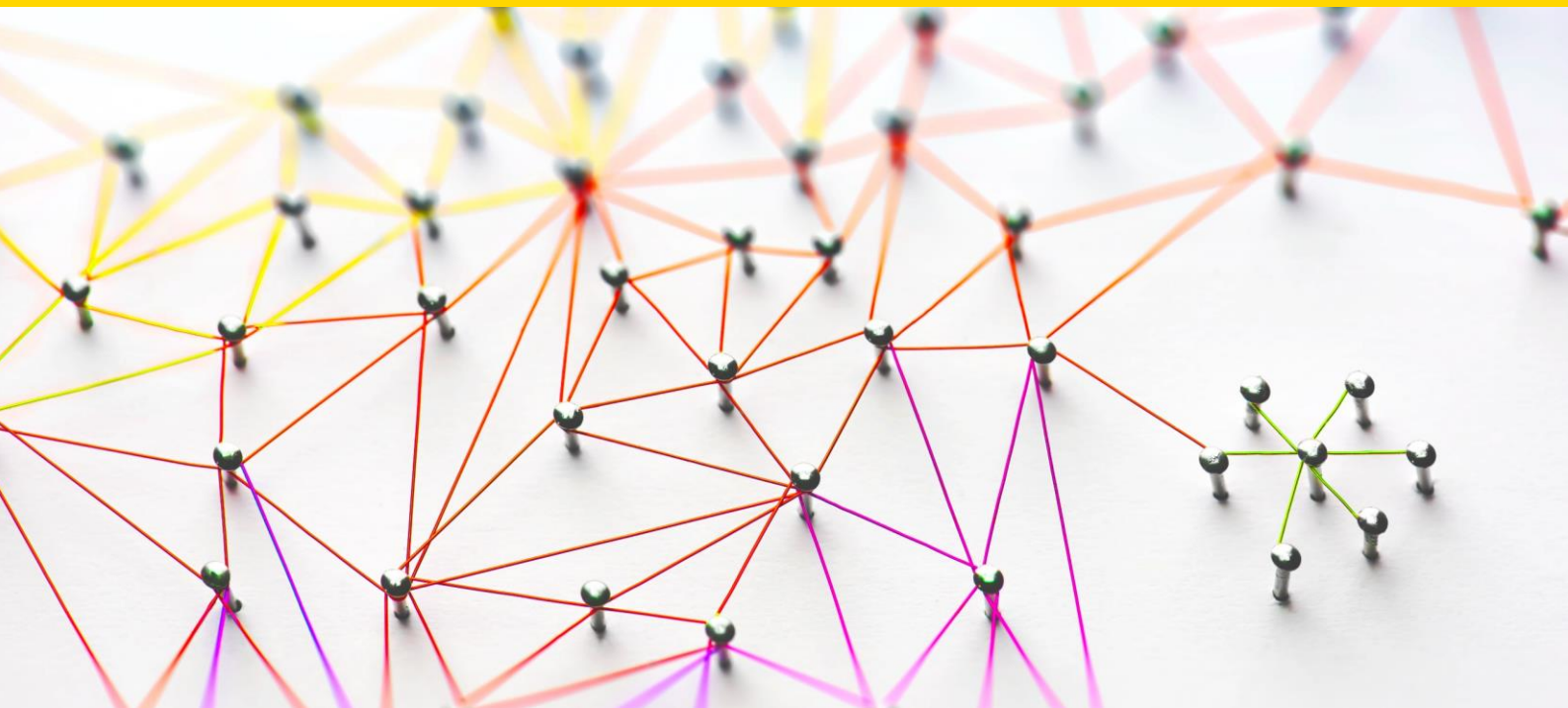
Population Framework for Monitoring Change

This framework is in two parts. The first includes those population indicators that drive change in the usual resident population. The table below highlights what those indicators are the sources for monitoring them. These allow assessment of whether the assumptions included in the projections are holding true.

The second are those factors that indicate the temporary population is increasing. This includes fly-in, fly-out workers and those people who have moved for the duration of a job but not changed their permanent address. This is the most challenging aspect to measure.

Table 11: Population indicators for monitoring change in the usual resident population

Indicator	Data source	When published	Comment
Births – Total Fertility Rate and Number of Births	Births, Australia, Cat. No. 3301.0	Annually (December)	Measures registrations and there have been issues with delays giving false indication of lower fertility. To monitor that fertility rates not changing markedly.
Deaths – Life expectancy and Number of Deaths	Deaths, Australia, Cat. No. 3302.0	Annually (September)	Due to small numbers three yearly rolling averages are published. Unlikely to change so not critical unless there is pandemic or similar.
Internal migration – age profiles	Census	Every five years	Next Census is 2021 with data likely to be released 2022/2023. Age data by 20-year age group are available from the internal migration estimates but these are likely to be too large to pick up changes in the propensity to move in or out as can be measured by the Census.
Internal migration	Migration, Australia, Cat. No. 3412.0	Annually (April)	Estimates derived from the estimated resident population (ERPs). Data from this source measures all migration moves in a year rather than migration transitions as measured by the Census. Numbers can fluctuate notably from year to year but provide an indicator of change. Published data should be analysed alongside local insights of what could be driving the changes. Useful to look at data for SA2s rather than LGA because this is the base geography used by ABS to calculate the estimate.

Indicator	Data source	When published	Comment
Overseas migration	Migration, Australia, Cat. No. 3412.0	Annually (April)	Estimates derived from the estimated resident population (ERPs). There are limited sources of data for small area impacts of overseas migration and this is a relatively new product prepared by the ABS.
Population	Regional Population Growth, Australia, Cat No. 3218.0	Annually (March)	Estimates of the usual resident population modelled from a base established following each Census. Key issue for areas undergoing rapid change is that data are nearly a year old when published (e.g. March 2020 will see publication of the population at 30 June 2019). Accounts for the usual resident population only so excludes those people who may be working long-term in an area on a fly-in, fly-out/drive-in, drive-out basis.

The most critical indicators are the annual release of the Estimated Resident Population (ERP) to identify how actual population trends are moving compared to projections, alongside monitoring of internal migration movements.

Standard population data are not released in a timely way to identify sudden changes. For Parkes, there is a need to monitor alternative sources of information to identify if growth is faster than anticipated. Importantly, it will also help inform the levels of non-resident workers who need accommodation and how this may exceed the usually resident population.

We have explored use of a range of data sources and development of change indicators. Those that are useful in this context are shown below. Because of variability due to factors other than population with these sources we propose using an index to baseline that monitors the extent of change as a prompt for investigating sources that require more in-depth analysis.

A two-pronged approach is recommended:

1. Monitor rates of change in water use and airline passenger numbers to gauge the quantum of difference between official population counts and the temporary population.
2. Develop a time series of survey data from Parkes' hotels, including a way to improve response rates, so that occupancy rates can inform estimates of the temporary population. Building a time series creates data to allow creation of forecasts.

Table 12: Monitoring temporary populations and identifying early warning indicators of growth

| Indicator	Data source	When published	How to use
Daily kilolitre water use	Parkes Shire Council	Daily data available. Given comparative data sources are less frequent assessing changes on monthly or every three months basis would be useful.	Compare trend line for water consumptions with changes in annual ERP. Differences indicate the presence of temporary populations over and above the usual resident population.
Rex passenger numbers	Rex Airlines as provided to Parkes Shire Council	Monthly data available. Given fluctuation a rolling three month or 12 month average would smooth trend lines.	Monitor monthly changes in passenger numbers as an early warning indicator of changes to the working age population.
Occupancy rates and occupant types	Survey administered by Parkes	To be established in a way that increases response rates (e.g. click and fill boxes in email form or app)	Apply survey results as percentages to baseline number of bed spaces available at hotels. Air BnB bed spaces and powered caravan sites could be added to the baseline for a more refined measure.
Workers by place of usual residence	Major employers	Ad hoc and provided to Council	Data on number of workers from out of Parkes (both historical and forward estimates) provides information on the temporary population.

APPENDICES

Appendix A: Changing Age Profiles, Parkes Shire Council, 2001-2018

Appendix B: Projections assumptions – sources and rationale

Appendix C: Scenario assumptions

Appendix D: Summary of population accounts by scenario
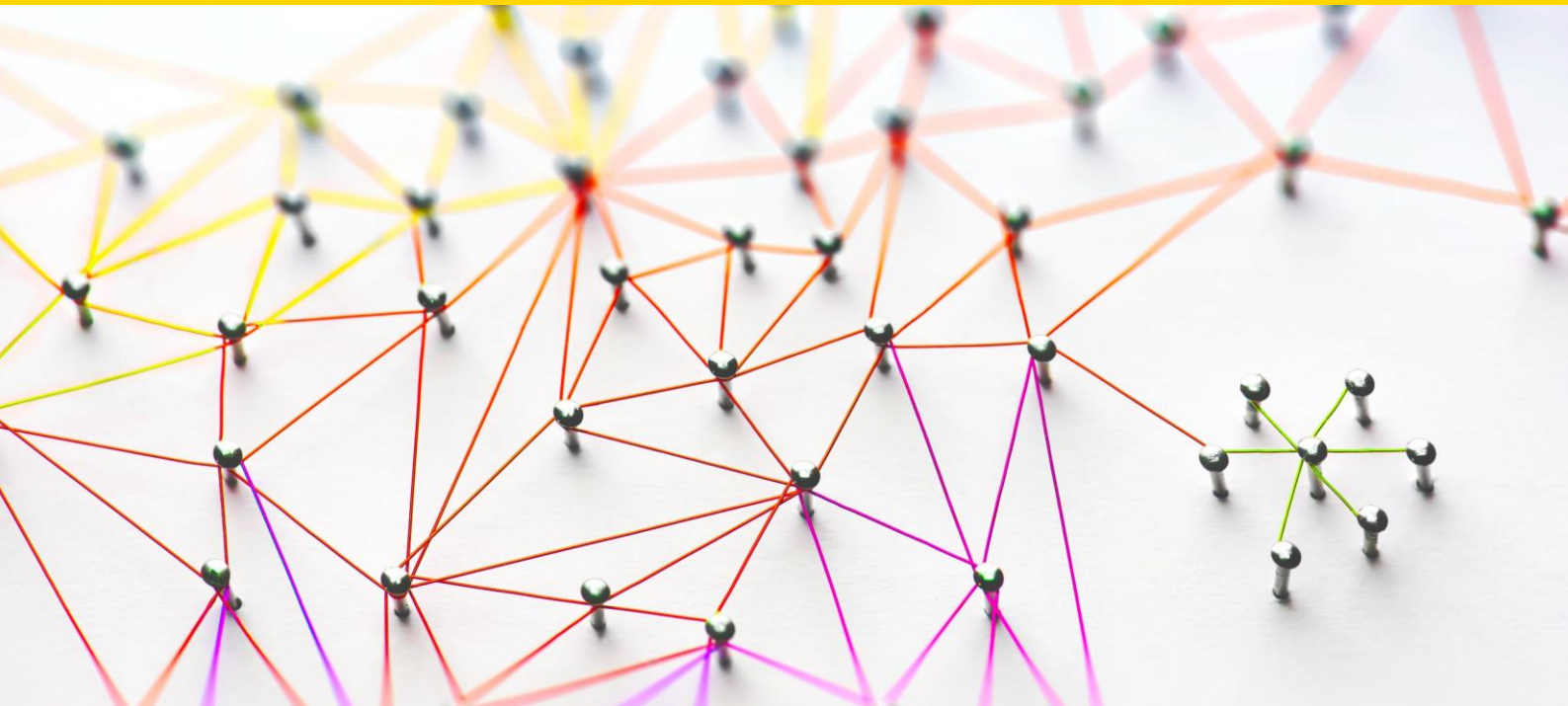
Appendix A: Changing age profiles, Parkes Shire Council, 2001-2018

	All ages	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 +
2001	14927	1196	1216	1182	1003	687	835	986	1072	1102	962	898	778	724	627	620	473	314	252
2002	14901	1153	1237	1173	1021	703	774	965	1030	1121	992	906	792	715	635	603	497	322	262
2003	14807	1118	1227	1189	999	719	743	949	998	1120	1004	919	787	727	628	592	513	327	248
2004	14690	1068	1207	1214	976	763	720	914	949	1117	999	918	809	734	637	564	512	355	234
2005	14627	1037	1188	1183	985	778	710	870	944	1070	1021	934	825	746	660	565	497	353	261
2006	14600	1012	1176	1146	992	797	736	820	930	1009	1053	939	851	748	674	558	517	344	298
2007	14643	1019	1142	1164	1001	777	762	778	938	947	1079	962	840	758	673	586	513	391	313
2008	14755	1052	1126	1168	1027	757	793	779	937	931	1057	996	857	739	698	594	512	404	328
2009	14835	1073	1097	1176	1042	756	837	759	920	895	1070	993	863	758	716	612	491	433	344
2010	14984	1096	1100	1181	1026	787	829	806	893	911	1032	1011	885	780	704	634	513	433	363
2011	15083	1076	1112	1208	1026	794	811	826	866	937	984	1043	916	795	701	648	509	453	378
2012	15048	1063	1068	1161	1061	795	781	826	807	948	968	1044	983	824	733	623	543	433	387
2013	15022	1044	1077	1110	1097	786	766	843	788	932	924	1050	1008	859	732	643	540	417	406
2014	14991	1047	1062	1041	1087	805	768	861	776	893	881	1077	997	895	762	657	536	409	437

	All ages	0 - 4	5 - 9	10 - 14	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	50 - 54	55 - 59	60 - 64	65 - 69	70 - 74	75 - 79	80 - 84	85 +
2015	14954	1033	1080	1006	1043	847	784	833	779	857	885	1065	980	952	779	659	531	417	424
2016	14924	1022	1111	985	1036	866	785	855	778	821	915	1001	1005	929	799	676	531	403	406
2017	14916	982	1127	1003	1015	883	788	817	804	780	906	972	1015	967	814	684	514	413	432
2018	14894	967	1087	1033	999	884	812	837	807	771	891	906	1013	1011	852	684	516	401	423
2001-2018	-0.2%	-19%	-11%	-13%	-0.4%	29%	-3%	-15%	-25%	-30%	-7%	0.9%	30%	40%	36%	10%	9%	28%	68%

Appendix B: Projection assumptions – sources and rationale

Jump-off population

2016 ERPs are used for the jump-off population. The 2016 ERP is the most accurate population measure available because it references the 2016 Census and accounts for those persons not counted on Census night, including persons who were overseas. While preliminary estimates are available for 2017 and 2018, because assumptions sourced from the Census also relate to 2016, this earlier base is used to create the most accurate baseline possible.

Fertility

The Total Fertility Rate (TFR) used in these projections is based on the average rate for Parkes Shire Council between 2011 to 2016. An average was used because in recent years there have been issues of late registration of births in NSW and it is not clear that the lower rates in recent years is a data issue or a real decline.

	Parkes TFR
2011	2.60
2012	2.57
2013	2.53
2014	2.37
2015	2.32
2016	2.17

Source: ABS, Cat No. 3301.0

To set the long term TFR trend, the ratio of Parkes and NSW rates was calculated based on historical data. This proportional difference was then assumed to be held constant against the ABS population projections for NSW, medium series.

The age profile supporting the TFR assumption was based on age-specific fertility rate data for the Central West SA4 (age-specific fertility rates are not published at LGA level). As shown below, these rates are for peak childbearing among women aged 25-29 years, followed by those aged 30-34 years.

	Births per 1,000 women
15 - 19	25.78
20 - 24	91.78
25 - 29	143.84
30 - 34	122.66
35 - 39	55.80
40 - 44	10.22
45 - 49	0.46

Source: ABS, Cat No. 3301.0

Mortality

Life expectancy at birth (e_0) assumptions were based on data published for the Central West SA4 with the average from 2010-12 to 2015-17 used.

		Life expectancy at birth
2010-2012	Males	78.2
	Females	82.6
	Persons	80.3
2011-2013	Males	78.0
	Females	83.5
	Persons	80.7
2012-2014	Males	78.4
	Females	84.1
	Persons	81.2
2013-2015	Males	78.1
	Females	84.3
	Persons	81.1
2014-2016	Males	78.1
	Females	83.7
	Persons	80.8
2015-2017	Males	77.6
	Females	83.8
	Persons	80.6

Source: ABS, Cat No. 3302.0

To set the long term life expectancy trend, the ratio of Parkes and NSW rates was calculated based on historical data. This proportional difference was then assumed to be held constant against the ABS population projections for NSW, medium series.

Behind the high level assumption is a mortality surface based on life tables that calculate the likelihood of surviving each age group. The mortality surface used here is the life table for Australia. Changes to this assumption have the smallest impact on longer-term population outputs.

Internal migration

Net internal migration assumptions have been informed by data from the Census. The net migration transition indicated by where people lived five years ago is taken as a proxy for annual moves in and out of Parkes Shire Council. This was tested against the regional migration estimates for the two SA2s that fall within Parkes LGA boundaries. While measuring migration in a different way, the fluctuations seen in the annual migration estimates are within the range shown by the Census. The Census was used here because of the ability to look at in and out flows by age and sex.

Net internal migration was held constant in the baseline scenario. While annual fluctuations are recognised, introducing such volatility into the model introduces greater difficulty in tracking where assumptions could be having an impact. Moreover, in the longer term growth projected the annual volatility makes little change to final outcomes.

The age profile of in and out migration moves are informed from the 2016 Census. Out-migration probabilities were calculated by dividing those who lived in Parkes in 2011 but elsewhere in 2016, by all persons living in Parkes in 2011. In-migration probabilities were calculated by dividing all persons who lived in Parkes in 2016 but were living outside Parkes in 2011 by all persons living outside Parkes in 2011. Figures showing these propensities are in the main body of the report. For the projections, the out-migration probabilities as measured by the Census were halved. This was informed by the likelihood that fewer people would leave based on current activities and the establishment of new opportunities in the future. This enabled creation of scenarios that only manipulated headline assumptions, allowing for easier assessment of different outcomes.

Overseas migration

Net overseas migration assumptions were set by first establishing what share of persons living overseas in 2011 and living in Australia in 2016 were living in Parkes Shire Council: 0.01%

This proportion was then applied to current Net Overseas Migration (NOM) data for Australia to set the annual NOM for Parkes. This proportion was also applied to the NOM assumption for Australia used by the ABS population projections for NSW, medium series.

The age profile for immigration to Parkes from overseas was informed by data from the Census. Due to small numbers, these actual numbers were smoothed to avoid perverse results that can arise from small numbers. Emigration numbers were estimated by multiplying immigration numbers by the ratio of NSW NOM arrivals and departures for the jump off year.

Appendix C: Scenario assumptions

These assumptions are constant through all scenarios

	2016-21	2021-26	2026-31	2031-36	2036-41
Fertility	2.39	2.30	2.20	2.20	2.20
Male e_0	77.6	84.5	85.2	85.2	85.2
Female e_0	83.8	84.5	85.2	85.2	85.2
Net Overseas Migration (NOM)	30	30	26	26	26

NIM out migration propensities	Half that as measured by 2016 Census

These assumptions for net internal migration (NIM) change in each scenario

	2016-21	2021-26	2026-31	2031-36	2036-41
1. Baseline	-46	-46	-46	-46	-46
2. Moderate growth	46	46	-46	-46	-46
3. High growth	150	75	0	0	0

Appendix D: Summary of population accounts by scenario

Low growth (baseline)

	2016-21	2021-26	2026-31	2031-36	2036-41
Start-of-period population	14,924	15,060	15,153	15,169	15,101
Births	1,000	957	906	891	879
Deaths	785	784	790	860	918
Natural change	*216*	*174*	*116*	*31*	*-40*
Net Internal Migration	-230	-230	-230	-230	-230
Net Overseas Migration	150	150	130	130	130
Net migration total	*-80*	*-80*	*-100*	*-100*	*-100*
Total population change	**136**	**94**	**16**	**-69**	**-140**
End-of-period population	15,060	15,153	15,169	15,101	14,961

Medium growth

	2016-21	2021-26	2026-31	2031-36	2036-41
Start-of-period population	14,924	15,545	16,164	16,252	16,239
Births	1,029	1,036	1,000	976	959
Deaths	788	796	811	889	956
Natural change	*241*	*239*	*188*	*87*	*3*
NIM	230	230	-230	-230	-230
NOM	150	150	130	130	130
Net migration total	*380*	*380*	*-100*	*-100*	*-100*
Total population change	**621**	**619**	**88**	**-13**	**-97**
End-of-period population	15,545	16,164	16,252	16,239	16,141

High growth

	2016-21	2021-26	2026-31	2031-36	2036-41
Start-of-period population	14,924	16,092	16,911	17,284	17,562
Births	1,029	1,102	1,078	1,071	1,074
Deaths	788	809	830	918	998
Natural change	*241*	*294*	*248*	*154*	*77*
NIM	230	375	-5	-5	-5
NOM	150	150	130	130	130
Net migration total	*380*	*525*	*125*	*125*	*125*
Total population change	***1,168***	***819***	***373***	***279***	***202***
End-of-period population	16,092	16,911	17,284	17,562	17,764