SOUTH-EAST WATER DEMOGRAPHIC PROJECTIONS

A Review Compared to VIF2022

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Spatial Economics

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EXECUTIVE SUMMARY

The purpose of this report is to review Spatial Economics' population and dwelling projections prepared for the South East Water (SEW) 2023-28 price review. This review is aided by the preparation of revised Victoria in Future 2022 (VIF2022) projections.

This report compares and assesses Spatial Economics population and dwelling projections with the equivalent VIF2022 projections.

In summary:

1. A review of the population and dwelling growth in the South East Water service area shows that Spatial Economics' previously prepared projections are still fit for purpose, once the revised 2021 census base has been included.
2. Normally, population and dwelling growth projections are systematically linked and in sync, but the two have become out of step with each other. During the coronavirus pandemic population growth faltered while dwelling activity was strong, partly owing to Government incentives. Now, as population growth recovers, the building industry is struggling to meet demand. Spatial Economics' projections show these differences.
3. Spatial Economics' dwelling projections are closely aligned to the VIF2022 projections for the SEW service area over the next ten years. The total dwelling requirement estimate over the ten-year period is only 1,774 different.
4. A comparison of Spatial Economics' and VIF2022 population projections shows similar projections of growth for the SEW service area. Spatial Economics projection to 2033 is 18,000 higher than VIF2022.
5. Regarding population change within the SEW service area, had an uneven impact. Suburbs with large student and itinerant populations (e.g. inner city and around universities) lost heavily. Growth area suburbs kept growing albeit at a slower rate.

The Next Five Years - Dwellings

Spatial Economics projections for dwelling growth are approximately 7,209 lower for the first five-year period and 5,435 higher for the second five-year period. This equates to a difference of only 1,774 dwellings over the ten-year projection period – a negligible difference.

In terms of average annual growth over the first five-year period (2023 to 2028), the two sets of projections assume:

- 12,000 dwellings per annum for VIF2022; and
- 10,600 dwellings for Spatial Economics (census update).

In terms of average annual growth over the second five-year period (2028 to 2033), the two sets of projections assume:

- 11,800 dwellings per annum for VIF2022; and
- 12,900 dwellings for Spatial Economics (census update).

It is Spatial Economics view that residential construction activity over the next three years will be subdued compared to historical rates of activity and will significantly increase in around 2026/27.

Spatial Economics over the first five-year period factored 'market' conditions into the dwelling projections. These 'market' conditions included such factors as the cost of consumer finance, cost of dwelling construction, changing dwelling vacancy rates, the extent of previous 'bring forward' demand due to home building incentives and the reflecting the temporary change to average household sizes.

Whereas the dwelling projections contained in VIF2022, assume a direct relationship between population, household formation and subsequent dwelling demand/construction.

1.0 Introduction

The purpose of this report is to review Spatial Economics' population and dwelling projections prepared for South East Water (SEW) in 2021. This review is aided by the preparation of revised Victoria in Future 2022 (VIF2022) projections. Last year the then Department of Environment, Land, Water and Planning prepared a new set of population, household and dwelling projections (VIF2022). As with past editions of VIF, these projections extended down to Australian Bureau of Statistics (ABS) Statistical Area 2 (SA2) level. There are 130 SA2 areas that are wholly or partly within the SEW service area. This report will compare and contrast Spatial Economics' population and dwelling projections with the equivalent VIF2022 projections.

As explained below, much has happened since Spatial Economics prepared the demographic projections for the SEW service area in 2021. The 2021 census has been published and population estimates revised. Victoria has emerged from the coronavirus pandemic and economic recovery is underway, albeit with major issues in the residential development industry.

This review will address how recent changes affect assumptions made in previous projections. In particular this review will focus impact on projected population and dwelling changes for the SEW service area over the next two regulatory periods (2023-2028 and 2028-2033).

In particular it will:

- discuss how the relationship between population growth and construction activity has been disrupted by the coronavirus pandemic and market interventions;
- review recent population trends published by the ABS and how these affect assumptions used in projections;
- review recent trends on dwelling construction approvals and other industry data that assists making projections over the next five years; and
- review of the latest population projections (VIF2022) and a comparison with previous Spatial Economics' projections provided to SEW as part of the 2023 price review.

Previous work by Spatial Economics

In 2021, Spatial Economics undertook short and long-term projections of population and dwellings for the SEW service area. In 2021, known uncertainty about the amount and distribution of population and dwelling growth in Melbourne was much greater than usual.

- The previous year the outbreak of the coronavirus pandemic had resulted in international borders being closed. Melbourne had begun a series of lockdowns that were to last until the Spring of 2021.
- Government measures to protect the economy, particularly job keeper and business support packages led to a burst of building activity despite the absence of population growth. In more normal times, population growth would generate additional households that drive demand for dwellings.
- At the time of Spatial Economics' consultancy, the 2021 census results had not been published and much of the other demographic and statistics being published lagged well behind the reality of events happening in Melbourne.
- When Spatial Economics reviewed key assumptions for SEW as part of final preparations for the submission of their price review, the 2021 census data and revisions of Estimated Resident Populations (ERP) back to 2017 had not been published.
- Consequently, there were big question marks about how deep the downturn would be, when the downturn would bottom out and how quickly and how great a recovery would be. It was a difficult time to plan for the future.

- For the short-term, Spatial Economics used the 5-year population projections made by the Victorian Treasury in the annual budget.
- Spatial Economics also conducted a review of assumptions following the release of the 2021 census and revised ERPs.

2.0 Projecting Population & Dwellings

Projections of population and dwellings are linked. Population growth generates additional households who seek housing. Household modelling uses the age structure of a population and models household formation and average household size based on past trends. Dwellings projections are made by assuming each household occupies a dwelling. Dwelling vacancy rates are then factored in to project the number of dwellings for any given area.

This is essentially a top-down approach that takes no account of land availability and other development constraints such as prevailing interest rates, costs of housing construction, etc. It works well for large 'geographies' such as States and Territories. Large cities such as Sydney and Melbourne however face increasing land constraints as they grow out towards the boundaries used by the Australian Bureau of Statistics (ABS) to define capital cities.

Land constraints are not factored in for Commonwealth Government population projections for capital cities and 'rest of states'.

At more local levels such as municipalities or regions within cities, a more bottom-up approach has to be used owing to land constraints. Here additional dwellings are projected on the basis of development trends, future greenfield land stocks and infill development prospects. Dwellings are then populated by households which are then filled with people of different ages, again using household modelling.

Population and household projections using this bottom-up approach is then reconciled at the regional level with top-down modelling approaches.

These techniques assume a transparent interaction between the underlying demand created by population growth and the dwelling construction trends which satisfy that demand.

In reality, especially over the coronavirus pandemic and its aftermath, the above relationship between population and dwellings has been unsteady. Over the last five years the relationship between population growth and dwelling growth has been 'soured' by the following:

- The coronavirus pandemic led to the international borders being closed, thereby cutting off the main source of population growth. Restrictions on internal movements between and within States further enforced immobility. But at the same time Commonwealth and State Governments introduced generous support packages to offset the economic damage the coronavirus pandemic could create - e.g. JobKeeper and JobSeeker allowances, new home builder incentive schemes, financial support to various industries. While population growth floundered, building activity – construction of new dwellings and renovations - boomed.
- When restrictions were eased the support packages ceased, builders faced both labour / skills shortages (unemployment rates went down to record low levels) and material shortages (supply chains were disrupted by the coronavirus pandemic and then by the war in Ukraine) and price increases above inflation rates. Over the last year the building industry has been further hit by interest rate rises. Ironically these events coincided with the return of overseas migration and population growth.

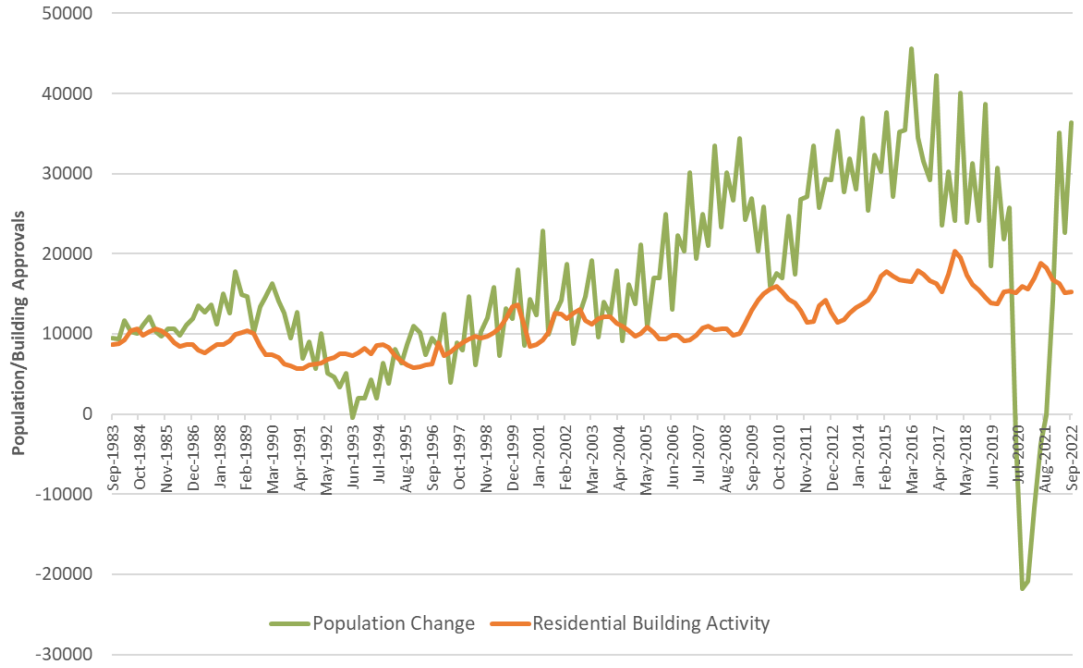
To address these issues, Spatial Economics has had to adopt a more nuanced approach to population and dwelling growth projection modelling for the SEW service area. This approach is one where, in the short term, the relationship between population growth and dwelling construction is not in sync year by year.

Population projections are made using the traditional component analysis – natural increase, overseas and internal migration.

Spatial Economics approach to undertake dwelling projections in the short term (0 to 5 years) was more nuanced i.e. factoring in differing and changing residential vacancy rates, temporary changes to the average household size, the likely impacts of increasing finance costs and the issue of 'bring forward' demand created by various home building incentives.

The graphic below illustrates that even in 'normal' conditions the rate of population change does not directly correspond to changes in residential building activity. This was even further exacerbated due to pandemic related issues and more recently the significant rate of increase in the cost of accessing home-purchase financing.

Graph 1: Quarterly Population Growth and Dwelling Approvals, Victoria, 1983-2022



Source: Australian Bureau of Statistics, Building approvals and Estimated Resident Population

3.0 Comparing Spatial Economics' and VIF 2022 population projections for the SEW service area

Table 1 below summarises the projected population estimate for the SEW service area. The Spatial Economics (census update) uses the base 2021 population for the SEW service area (rounding differences explain the slight difference to the base calculated in VIF2022) and applies the annual growth rates.

The table below illustrates that as measured from 2021 to 2036 both VIF2022 and Spatial Economics (census update) closely align in term of projected growth. In summary:

- VIF2022 assumes an average annual population growth rate of 1.29% per annum; and
- Spatial Economics (census update) assumes an average annual population growth rate of 1.36% per annum.

This equates to an average annual population growth of:

- Just over 25,000 persons for the VIF2022 projection; and
- Nearly 26,500 persons for Spatial Economics (census update) projection.

As measured at 2036 the total population estimates for the SEW service area from the two projections are marginally different. By 2036 VIF2022 estimates are approximately 22,000 persons less than the Spatial Economics (census update) projection. – this represents around a 5% difference from the total estimated population change.

Table 1: Comparison of Spatial Economics and VIF2022 population projections for SEW Service Area

Year ending 30/6	VIF2022**	Spatial Economics (Original)*	Spatial Economics (census update)
2021	1,771,969	1,807,059	1,772,147
2022	1,775,569	1,810,490	1,775,511
2023	1,794,502	1,832,758	1,797,349
2024	1,819,355	1,865,160	1,829,125
2025	1,847,090	1,896,472	1,859,833
2026	1,876,183	1,926,945	1,889,717
2027	1,903,866	1,956,601	1,918,800
2028	1,931,367	1,986,257	1,947,883
2029	1,958,885	2,015,913	1,976,966
2030	1,986,392	2,045,569	2,006,049
2031	2,014,202	2,075,225	2,035,132
2032	2,041,697	2,102,621	2,061,998
2033	2,068,645	2,130,016	2,088,865
2034	2,095,170	2,157,412	2,115,731
2035	2,121,293	2,184,807	2,142,597
2036	2,147,358	2,212,203	2,169,464

Note: * The Spatial Economics (original) projection was undertaken prior to the revision of Estimated Resident Populations that were published by the ABS in July 2022 This revision reduced the 2021 Estimated Resident Population – the base used in subsequent projections.

** Data supplied by SEW

In the terms of the next two five year periods the difference between the VIF2022 and updated Spatial Economics projections for the SEW service area are as follows:

Table 2: Comparison of Spatial Economics and VIF2022 projected population growth for the next two five-year periods

	VIF2022	Spatial Economics (census update)
2023-2028	136,865	150,534
2028-2033	137,278	140,982
2023-2033	274,143	291,516

Spatial Economics projections for population growth are approximately 13,700 higher for the first five-year period and 3,700 higher for the second five-year period. This equates to only a 1,740 person average annual difference over the ten-year projection period – a negligible difference.

In terms of population growth rates over the first five-year period (2023 to 2028), the two sets of projections assume:

- a 1.5% average annual growth rate for VIF2022; and
- a 1.6% average annual growth rate for Spatial Economics (census update).

In terms of population growth rates over the second five-year period (2028 to 203), the two sets of projections assume a 1.4% average annual rate of population growth.

4.0 Reviewing Population Growth Trends for the SEW service area and its Spatial Distribution

Following the ABS revision of 2021 population estimates, the population growth of the SEW service area over the last 20 years was as follows:

Table 3: Estimated Resident Population – SEW Service Area

Year	Estimated Resident Population
2001	1,263,150
2006	1,368,898
2011	1,505,479
2016	1,685,670
2021	1,772,147

Source: Australian Bureau of Statistics. Estimated Resident Population

Table 4: Estimated Resident Population – Selected Regions

Five-year period	Absolute growth	Annual Growth Rate (%)		
	SEW Region	SEW Region	Gr. Melbourne	Victoria
2001-2006	105,728	1.6%	1.4%	1.2%
2006-2011	136,600	1.9%	2.1%	1.8%
2011-2016	180,191	2.3%	2.5%	2.2%
2016-2021	86,477	1.0%	1.1%	1.2%

Source: Australian Bureau of Statistics. Estimated Resident Population

Covid-19 impacted significantly on population growth. Following the start of the coronavirus pandemic Victoria's population declined for the first time in one hundred years. Comparing the last full year before the outbreak (2018-2019) with the most recent affected year (2020-2021) shows the following contrasts:

- in 2018-2019 Australia's population grew by 374,000 whereas in 2020-2021 it grew by 33,000;
- in 2018-2019 Victoria's population grew by 113,000 whereas in 2020-2021 it shrank by 58,000; and
- in 2018-2019 Greater Melbourne's population grew by 88,000 whereas in 2020-2021 it shrank by 77,000.

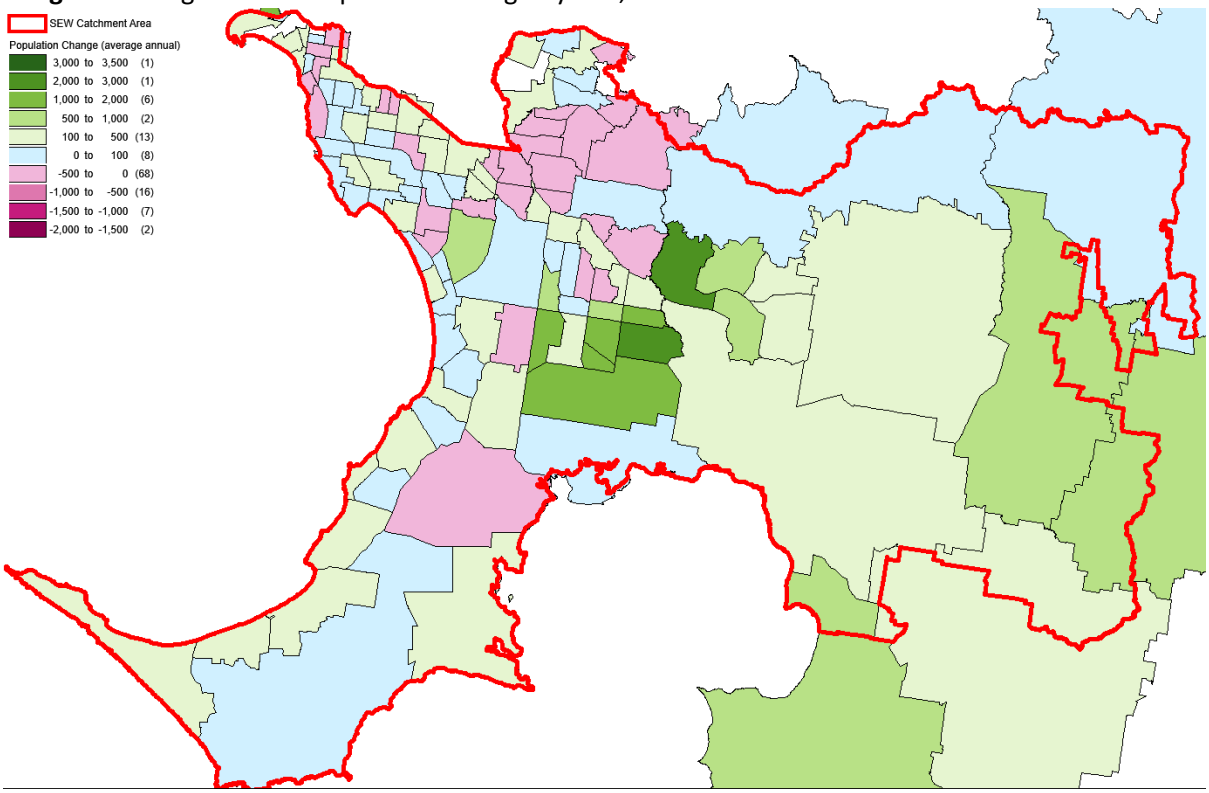
Within Australia, Victoria bore the brunt of the pandemic and, within Victoria, Greater Melbourne was most heavily impacted.

Within the SEW service area the pandemic impacted unevenly. Average annual changes between 2016 and 2020 shows a picture of moderate population growth and losses across the SEW region but very strong growth in areas with greenfield land supply sources, particularly new suburbs in the South-East Growth Area.

The top ten growth suburbs (i.e. SA2 zones) accounted for 36% of the SEW service area's growth. Nine of these were in the South East Growth Area. Meanwhile 31 out of the 130 SA2 zones -all established suburbs - in the SEW service area experienced moderate population losses.

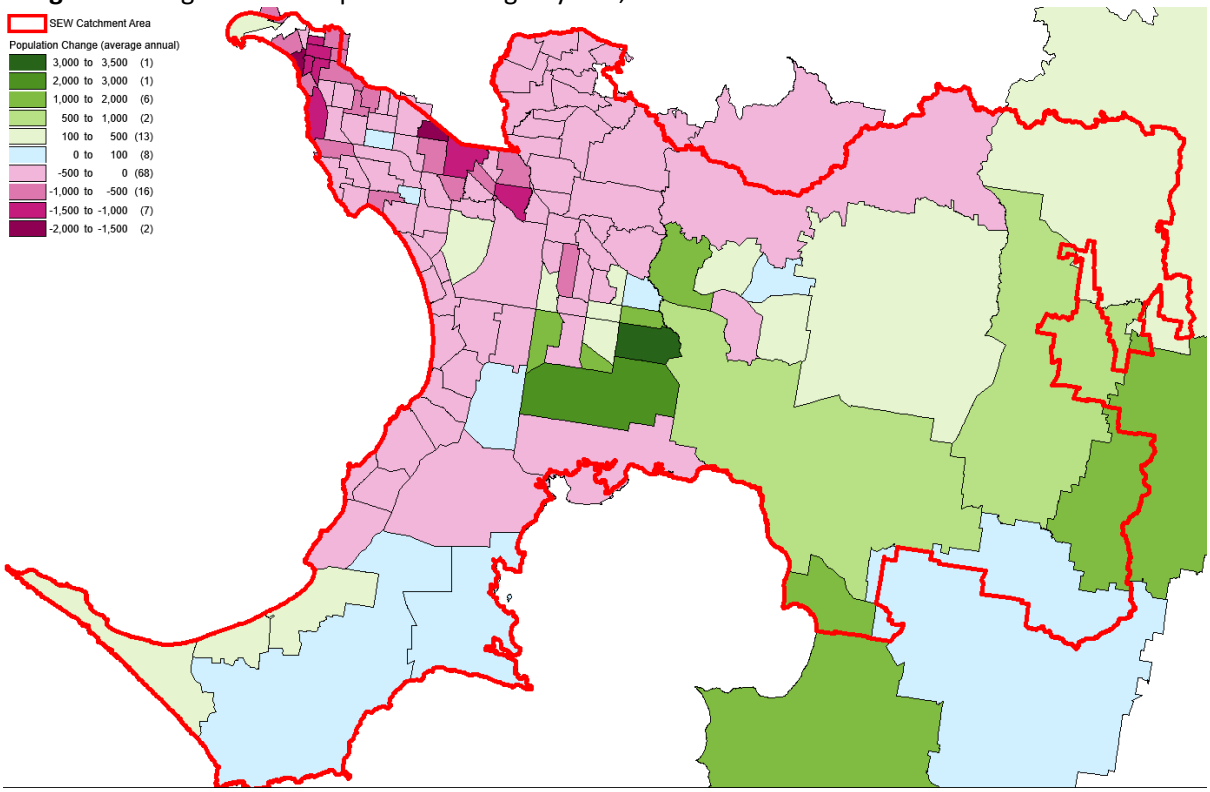
The last four months of 2019-2020 had a sharp and sudden impact on population change, particularly in the inner city. Many international students, backpackers and other temporary migrants left the country following the start of the coronavirus pandemic.

Image 1: Average Annual Population Change by SA2, 2016 to 2020



Population changes over the 2020-2021 year show a very different distribution of population growth and loss. Major losses of population occur in areas with high student populations (particularly Monash and Clayton) and in the inner-city suburbs with their normally itinerant populations, including students. Many other established middle ring and outer suburbs experienced solid population losses. Overall, 97 out of the 130 SA2 zones in the SEW service area lost population. The new suburbs in the South East Growth Area still grew strongly, albeit on a more modest scale than prior to the pandemic. Building industry incentives kept supply going despite overall population growth floundering.

Image 2: Average Annual Population Change by SA2, 2020 to 2021



The 2022 Estimated Resident Populations published by ABS on 20th April, 2023, are preliminary and subject to revision, They do, however, provide the best estimates of recent population change and are therefore worthy of analysis and comment.

They show that the SEW service area grew by 12,736 people or 0.7% in 2021-2022. This compares with a growth rate of 1.1% for Greater Melbourne.

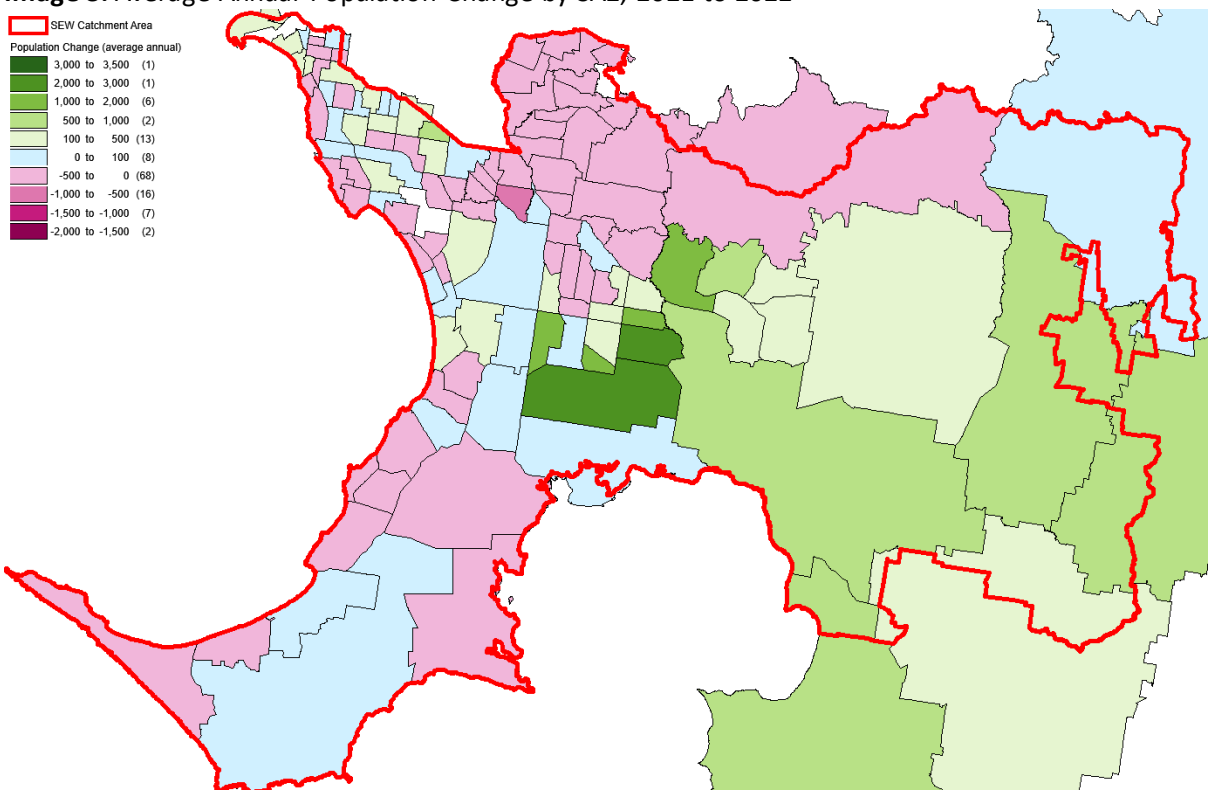
Within the SEW service area there has been a range of changes. 62 of the SA2s of the 130 gained population, 64 lost population and 4 had no change.

The strongest gains were:

- where greenfield development had occurred in the South Eastern Growth Area
- in areas around universities, such as Clayton and Caulfield North, as students returned to study on campus
- in some inner-city suburbs such as South Yarra and Southbank where major residential developments had been completed

Population losses were mostly small and concentrated in established suburbs as well as the Mornington Peninsula. There were also more significant losses in the Dandenong, Noble Park Springvale South area.

Image 3: Average Annual Population Change by SA2, 2021 to 2022



5.0 Most Recent Population Trends

Given the volatility of change over the last few years and the extent of uncertainty about the short-term future, it pays to monitor latest trends. Recently published ABS data has surprised analysts by the size and pace of recent population change of Australia and Victoria.

The latest quarterly population estimates for States and Territories were published by the ABS on 16th March 2023. These suggest that the post- Covid recovery is occurring faster than expected with population growth over the next two years being much greater than any of the projections (Spatial Economics, Victoria in Future, Victorian Treasury, Commonwealth Government's Centre for Population) assumed.

The ABS estimates are for the end of the September quarter, 2022. This series of quarterly population estimates go back over 40 years and include the components of population change (i.e. migration and natural increase). The September estimates show that:

- Australia's population grew by 418,000 or 1.6% in the year up to that point. This demonstrated the impact of the lifting of border restrictions in late 2021. Australia's population growth was the highest since 2009. In the year up to the September quarter 2021, Australia's population growth had only been 67,000.
- Victoria also recorded a return of population growth to the pre-pandemic boom years. Over this same time Victoria's population increased by 109,000 or 1.7%, the fastest since 2019.

Table 5: Annual population growth rates, Victoria and Australia (September quarter)

Year	Victoria	Australia
2017-18	1.9%	1.5%
2018-19	1.7%	1.5%
2019-20	0.3%	0.8%
2020-21	-0.6%	0.3%
2021-22	1.7%	1.7%

- The reason for this growth recovery at the national and state level was the surge in overseas migration. In the year up to 30 September 2021, net migration to Australia had a net loss of 56,000. In the following year it was a net gain of 304,000.
- Net migration is, of course, the balance of long-term arrivals and departures. That growth in net migration was due to (a) the return of large numbers of temporary migrants (mostly students and backpackers) entering Australia and (b) only a small increase in the number of people emigrating from Australia. At the outbreak of pandemic the Commonwealth Government warned temporary migrants that they could not expect to receive financial benefits. They were advised to go home, and most did. This drained most of Australia's pool of temporary migrants.

Table 6 : Overseas Arrivals and Departures, Australia, (September quarter)

	2020-21	2021-22
Overseas Arrivals	163,000	537,000
Overseas Departures	207,000	233,000
Net Overseas Migration	-56,000	304,000

Source: Population Estimates to Sept, ABS, March 2023

- Net overseas migration to Australia in the full 2022-23 financial year could be around 400,000. This compares with a forecast of 235,000 for 2022-23 and 2023-24 used in the Commonwealth Government's November budget. Net migration of 235,000 per year is also used in the Commonwealth Government's Centre for Population's projections through to 2033. This has led some commentators, such as Abul Rizvi, a former Deputy Secretary of the Department of Immigration, to suggest that the Commonwealth Government had significantly underestimated net overseas migration.

What is the significance of this for South East Water? Consider the following:

- in the last three financial years prior to the pandemic (i.e. 2016-2019), 63% (743,000) of Australia's population growth of 1.2 million came from net overseas migration;
- 35% of Australia's net migration came to Greater Melbourne;
- 10% of Australia's net overseas migration gains came to the SEW service area. Net overseas migration accounted for over 60% of the SEW service area's population growth in that period; and
- the Commonwealth Government's Centre for Population projections (used in the federal budget) assume that, from this financial year onwards, Greater Melbourne's share of net overseas migration gains will be 31%.

Therefore, Greater Melbourne's and the SEW service area's future growth will be strongly influenced by the size of national net overseas migration, something that is beyond its or the Victorian Government's control.

In the past Spatial Economics has warned that overseas migration is 'the elephant in the room' when it comes to forecasting future population growth. Given recently published data, this warning remains particularly apt.

Planners in all industries therefore need to keep a close watch on population trends as they are published every three months by the ABS. Over the last five years population change has been volatile and unexpected. They remain so in 2023. Note that the Victorian annual population growth rate for the 2021-22 financial year was 1.1%. Three months later, annual growth rate had jumped to 1.7%.

Nevertheless, at the moment, Spatial Economics' view is that its past projections and VIF2022 are both fit for use. The ABS national and state population estimates for the full 2022-23 financial will not be published until December 2023, and a year later for 2023-24. In each case, sub-state estimates – used to monitor population trends for and within the SEW service area - lag by a further four months.

Average Household Size

As part of the projections provided to SEW during the price review project, Spatial Economics' referred to the importance of household size – how average household had fallen from 4.5 in 1910 to 2.6 in recent years – a level that has been steady for the last 20 years. The shift down in average household means that for a given population, there will be more dwellings required to house that population.

It was also reported that the peculiar circumstances of the pandemic had resulted in an implied decline of 0.03 in average household size as shown in the unpublished VIF2021 projections. It was thought that the demands on space for working at home had contributed to this reduction.

VIF2022 updates this analysis. The 2021 census showed an average household size for Greater Melbourne of 2.61 the same as that reported in the 2016 census and is used in VIF2022 as the base of the projections. It is noted that VIF2022 assumes that average household size for Greater

Melbourne drops to 2.55 – a very significant drop - by 2026 and thereafter declines very slowly to 2.50 by 2051.

A note on State Budget projections of population growth rates

The table below illustrates the problems experienced in projecting Victorian population growth rates, even for a short time frame – the four years used in State budgets. State budgets are handed down in May or June, prior to the commencement of a new financial year. State Treasury therefore has to estimate the growth for a year prior to its completion.

Following the release of the 2022 census, Victoria's Estimated Resident Population was revised down by 100,000 people lowering growth back to the 2016-17 financial year. So even 'actual' growth rates used in the budget were at odds with revised ABS estimates.

This table also shows how the pandemic was thought to affect population growth over the following four years. In each case the recovery was expected to have occurred within four years. It appears, however, that the speed of the recovery following the removal of border controls has been faster than expected.

Four-year State Budget forecasts of population growth rates for Victoria are aligned with Victoria in Future (VIF) State level projections.

The table also illustrates just how hard it is to get projections 'right' even at the State level. Constantly monitoring trends and amending projections is the best one can do as unexpected events create volatile growth rates.

Table 7: A Comparison of DoT Projected Growth and ABS Population Growth Estimates for Victoria

	State Budget 2019-20	State Budget 2020-21	State Budget 2021-22	State Budget 2022-23	ABS official estimate
2017-18	2.2%				1.9%
2018-19	2.1%	2.1%			2.0%
2019-20	2.0%	1.6%	1.5%		1.8%
2020-21	1.9%	0.2%	0.0%	-0.7%	-0.9%
2021-22	1.9%	0.4%	0.3%	0.1%	1.1%
2022-23	1.8%	1.1%	1.2%	1.2%	
2023-24		1.7%	1.7%	1.7%	
2024-25			1.7%	1.7%	
2025-26				1.7%	

Source: Victorian State Budget papers and ABS population estimates

6.0 Dwelling Forecasts – A Comparison

In comparison to the population projections contained in both VIF2022 and Spatial Economics (census updated), the dwelling projections over the ten-year period from 2023 essentially perfectly align.

As measured from 2023 to 2033 the total dwelling requirement difference is just 1,774. VIF2022 project a total dwelling requirement of 118,290, whilst Spatial Economics (census update) project a total dwelling requirement of 117,206.

However, there are differences in the two projections when measured over a temporal basis.

As noted previously, Spatial Economics over the first five-year period factored 'market' conditions into the dwelling projections. These 'market' conditions included such factors as the cost of consumer finance, cost of dwelling construction, changing dwelling vacancy rates, the extent of previous 'bring forward' demand due to home building incentives and the reflecting the temporary change to average household sizes.

Whereas the dwelling projections contained in VIF2022, as detailed previously, assume a direct relationship between population, household formation and subsequent dwelling demand/construction.

Spatial Economics (census update) projections, however, has incorporated assumed 'market' conditions into our projections that effectively delay the expression of underlying demand for housing based on population growth.

This, therefore, has resulted in the dwelling growth estimates in the first five-year interval being less than the VIF2022 estimated growth, but greater in the second five-year interval.

In the terms of the next two five years periods the difference between the VIF2022 and updated Spatial Economics projections for the SEW service area are as follows:

Table 8: Comparison of Spatial Economics and VIF2022 projected dwelling growth for the next two five-year periods

	VIF2022	Spatial Economics (census update)
2023-2028	59,999	52,790
2028-2033	58,981	64,416
2023-2033	118,980	117,206

Spatial Economics projections for dwelling growth are approximately 7,209 lower for the first five-year period and 5,435 higher for the second five-year period. This equates to only a 1,774-dwelling difference over the ten year projection period – a negligible difference.

In terms of average annual growth over the first five-year period (2023 to 2028), the two sets of projections assume:

- 12,000 dwellings per annum for VIF2022; and
- 10,600 dwellings for Spatial Economics (census update).

In terms of average annual growth over the second five-year period (2028 to 2033), the two sets of projections assume:

- 11,800 dwellings per annum for VIF2022; and
- 12,900 dwellings for Spatial Economics (census update).