Horowhenua Socio-Economic projections

Summary and methods

Projections update report, May 2020

SENSE PARTNERS
DATA LOGIC ACTION

Summary of projections

This update report presents long term population and economic projections for Horowhenua District.

Strong growth expected

Horowhenua's population is projected to grow:

- by 1.8% per year, over the next 10 years
- more quickly than the national population (1.2% per year)
- more quickly than the average of the past 10 years (1.5% per year)
- more slowly than the average of the past 6 years (2.1% per year).
- substantially more quickly than in our previous projections (0.5% per year).

TABLE 1: POPULATION PROJECTIONS[1]

Population

	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
2019	34,956	34,956	34,956	34,956	34,956
2029	39,983	41,022	41,896	42,941	44,968
2039	40,822	44,138	47,006	50,913	59,010
2049	39,542	45,188	51,862	59,250	79,243
2059	37,741	45,443	55,626	69,501	105,044
2068	35,301	45,185	59,172	78,168	131,741

Population growth, compound annual average growth rate

	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
2019					
2029	1.4%	1.6%	1.8%	2.1%	2.6%
2039	0.2%	0.7%	1.2%	1.7%	2.8%
2049	-0.3%	0.2%	1.0%	1.5%	3.0%
2059	-0.5%	0.1%	0.7%	1.6%	2.9%
2068	-0.7%	-0.1%	0.6%	1.2%	2.3%

[1] The percentiles presented in Table 1, and elsewhere in the report, are calculated by simulating population change while varying the main drivers of population growth, such as immigration rates. These simulations are calibrated based on historical variations. This produces a range of results which is summarised by ranking the projections and presenting them according to their ranking or percentile.

Growth driven by strong domestic immigration

Horowhenua's strong population growth is driven by a continued substantial inflow of migrants from other parts of New Zealand.

We are forecasting a net inflow of 650 domestic migrants per year over the next 10 year. This is a substantial upward revision, from 270 migrants per year in our 2019 forecasts.

In our 2019 forecasts we noted that

> *"it appears that domestic migration into Horowhenua has been higher than we or other experts, such as Statistics New Zealand, would have predicted three or four years ago. This is likely to be due to a combination of factors including:*
>
> - *improved accessibility from the expressways that have been built to the south of the District*
> - *increased costs of living, especially house price inflation, in most urban centres including Palmerston North and Wellington*

We also noted that we did not yet have sufficient up-to-date data, such as from the census, to account for observed increases in domestic migration.

Since the 2018 census data has become available and estimates of Horowhenua's population have been revised up yet again, it has become even more apparent that we needed to revise our projection methods and so we have done this.[2]

Our forecasts of Horowhenua's population growth are also affected by assumptions about the effects of border closures on outward international migration. An extended period of border closures is expected to boost Horowhenua's population growth as fewer people leave the district to move overseas.

COVID-19 brings new sources of uncertainty

While our previous projections were subject to several significant sources of uncertainty, such as policy change and a deficit of data[3], these 2020 projections must contend with the effects of a global pandemic.

Our forecasts assume the following effects from COVID-19:

---

[2] The census led to substantial increase in estimates of Horowhenua's population. Although, ironically, our new projections of domestic migration are only partly based on census data. The census data on internal migration has been rated as "very poor", after the question relating to prior address was dropped from the census in favour of linking data between censuses.

[3] At the time of our previous update (July 2019) problems with the 2018 census meant that data from the census was not yet available. Even now, a substantial amount of census data has not been publicly released, even though it has been more than 2 years since the census. This means that estimates and forecasts of the following variables should be considered provisional and subject to revisions once census data is available: households (number and type), labour force status (i.e. labour force participation and unemployment status), household incomes.

- international borders closed to migrants for the 12 months to March 2021[4]
- a sharp but reasonably short-lived economic shock, based on the New Zealand Treasury's Budget Economic and Fiscal Update (May 2020), where:
  - the national unemployment rate rises to 8.3% in June 2020, from 4.0% in 2019, and then falls to 7.6% in the June quarter 2021
  - real GDP growth falls 4.6% in the year to June 2020 and -1.0% in the year to June 2021 before recovering in 2022

We tend to the view that these economic assumptions are optimistic. However, as they are Budget numbers, they provide a useful benchmark – especially at a time when forecasters are revising their views daily.

These economic shocks are expected to cause average household incomes to decline, on average, over the next 10 years.

TABLE 1: GROWTH IN AVERAGE HOUSEHOLD INCOMES, AFTER INFLATION

Annual average growth between dates

	5th percentile	25th percentile	50th percentile	75th percentile	95th percentile
2019	--	--	--	--	--
2029	-1.5%	-0.8%	-0.4%	-0.1%	0.5%
2039	0.7%	0.9%	1.0%	1.1%	1.2%
2049	0.1%	0.3%	0.4%	0.4%	0.4%
2059	0.7%	1.0%	1.0%	0.7%	1.1%
2068	0.5%	0.2%	0.4%	0.7%	0.6%

It is quite possible that these COVID-related economic shocks, or larger ones, could cause a significant shift in population growth dynamics in Horowhenua and throughout New Zealand. Importantly, the uncertainty ranges in our projections do not account for the possibility of such shifts. That being so, the level of uncertainty quantified in our near-term projections is under-stated.

Given this unquantified uncertainty it would be unwise to speculate about potential further positive effects on population growth from transport projects (such as Transmission Gully and the Otaki to Levin link) – as was done in our previous projections.

That said, our revised projections are higher than previous forecasts that accounted for the effects of transport projects. Recent population growth in Horowhenua has, at least partly, results from increased accessibility due to roading projects. This lift in attraction to Horowhenua is now factored directly into the population growth forecasts.

[4] We assume closure to 95% of all migrant flows i.e. immigrants to New Zealand and emigrants from New Zealand.

Our 2020 forecasts for Horowhenua will feed into the development of scenarios for future growth and economic development. These scenarios, which are yet to be produced, will consider the potential for alternative futures for Horowhenua based on economic trends and the potential for positive or negative economic shocks.

Comparisons against Statistics New Zealand projections

The population projections presented in this report are higher than Statistics New Zealand projections for the Horowhenua released in 2017. The differences are summarized in Table 5.

TABLE 5: COMPARISON WITH STATISTICS NEW ZEALAND PROJECTIONS

POPULATION PROJECTIONS ('MEDIUM' SCENARIOS)

	Year	Age: 0-14	Age:15-39	Age:40-64	Age:65+	All ages
Statistics New Zealand	2013	6,020	7,490	10,380	7,280	31,170
	2018	5,900	8,060	10,250	8,050	32,260
	2023	5,800	8,050	9,660	8,920	32,430
	2028	5,680	7,940	8,950	10,000	32,570
	2033	5,580	7,320	8,660	10,860	32,420
	2038	5,310	6,850	8,580	11,310	32,050
	2043	4,990	6,630	8,520	11,350	31,490
Sense Partners	2013	6,020	7,490	10,380	7,280	31,170
	2018	6,300	8,500	11,000	8,500	34,300
	2023	7,270	10,045	11,306	9,319	37,940
	2028	8,298	11,002	11,536	10,437	41,273
	2033	9,088	11,395	12,288	11,441	44,211
	2038	9,169	11,966	13,116	12,333	46,583
	2043	9,045	12,874	14,143	12,868	48,929

ANNUAL AVERAGE GROWTH RATES

	5 Years to:	Age: 0-14	Age:15-39	Age:40-64	Age:65+	All ages
Statistics New Zealand	2018	-0.4%	1.5%	-0.3%	2.0%	0.7%
	2023	-0.3%	0.0%	-1.2%	2.1%	0.1%
	2028	-0.4%	-0.3%	-1.5%	2.3%	0.1%
	2033	-0.4%	-1.6%	-0.7%	1.7%	-0.1%
	2038	-1.0%	-1.3%	-0.2%	0.8%	-0.2%
	2043	-1.2%	-0.7%	-0.1%	0.1%	-0.4%
Sense Partners	2018	1.0%	2.5%	1.1%	3.1%	1.9%
	2023	3.0%	3.3%	0.5%	1.8%	2.0%
	2028	2.6%	1.9%	0.4%	2.3%	1.7%
	2033	1.9%	0.7%	1.4%	1.9%	1.4%
	2038	0.2%	1.0%	1.3%	1.5%	1.1%
	2043	-0.4%	1.5%	1.5%	1.0%	1.0%

The difference between Sense projections and Statistics New Zealand's projections are differences in views about international migration and different assumptions regarding rates of domestic migration into Horowhenua. Our assumptions about fertility and mortality rates are very similar.

Method

These projections should be interpreted as potentials. The projections do not, for example, take account of national or local policy changes which can affect actual population and economic growth.

Demographics

The method used to produce the population projections is a conventional population projection model, with a few relatively novel aspects.

The model simulates populations by age, by sex by District.

Fertility and mortality rates are projected using the same methods that Statistics New Zealand uses to project age- and sex-specific mortality rates.[5, 6]

International migration is predicted at the national level using a model of migration which accounts for trends and patterns in growth in arrivals from different types of countries in conjunction with changes in outward migration and economic conditions in New Zealand and Australia (unemployment rates and real exchange rates).[7]

Ages of migrants and domestic destinations of international migrants are determined based on observed historical probabilities that migrants are of a given age and the propensities these migrants must move to particular parts of New Zealand (in this case Districts).

Internal domestic migration is based on age- and origin- and destination-specific probabilities of observed migration in each of the censuses from 2001 to 2013[8] and experimental origin-destination domestic migration data for the period 2013-2017. So, each District's inward domestic migration reflects the size and age distribution of other Districts from which it traditionally sources migrants.

At the household level, living arrangements are based on methods used by Statistics New Zealand. Each age and gender has an observed historical (Census-based) probability of residing in a different household type. The probabilities used here are national-level probabilities.[9]

---

[5] Demography package for R, by Rob J Hyndman with contributions from Heather Booth, Leonie Tickle and John Maindonald.

[6] Actual data on age-specific rates at the district level are limited and so these are inferred using splines to interpolate between ages where age-group data is available.

[7] To be precise, the model is a mean of forecasts from 3 different types of models: a set of univariate time series model, a vector-autoregression, and a vector-error correction model with economic components. The latter includes cluster analysis of arrivals from different countries which allows grouping of countries into 4 different groups which tend to move together.

[8] The number of observations here is limited but the probabilities have proved to remain remarkably stable over time.

[9] Except that, in the national context, projections for Auckland include adjustments to reflect the large numbers of multi-family households in Auckland This overall approach, using national 'living arrangement

Economic projections

The economic projections are based on a 'growth accounting' method, whereby growth is predicted based on growth in the working age population, labour force participation rates, unemployment rates, and productivity.

Here labour force participation rates are modelled at the national level and district rates are estimated based on typical age-specific deviations from national rates.[10]

Unemployment rates are also modelled at the national level and age-specific deviations from national rates are used to model persistent differences in unemployment rates at different ages in different districts.

The model used to predict unemployment rates at the national level takes account of changes in labour force growth and other economic factors on unemployment rates. It also includes a measure of labour productivity.[11] Predictions of productivity growth come from this model.

There is no attempt to model district-level productivity growth, rather districts are assumed to face random fluctuations in productivity which move around the national average.

Industry projections are based on a model of trends in industry shares of GDP. At the district level, industry output is then projected using historical correlations between movements in national output and district output. So, the district's fortunes are attached to national trends, but also reflect local cycles and comparative advantages.

Randomness

To run simulations and produce ranges for projections we use the observed errors in our models and underlying variation in the variables we are modelling to produce 'prediction intervals'. In each simulation, we draw randomly from these prediction intervals.

Not all variables are subject to this randomness directly[12] and some variables do not fluctuate a great deal. The most volatile components of the projections are: migration, productivity, and industry GDP growth shares.

---

type rates' is a weakness in this modelling method but is accepted for the time being in the absence of better data to discriminate 'living arrangement type rates' by district.

[10] The national rates are modelled using logistic growth curves which help to capture the rising, but ultimately limited, rates of participation of older age groups.

[11] The national model of unemployment rates is a vector auto-regression of unemployment, CPI, labour force, interest rates, and earnings per hour ('labour productivity). The use of vector auto-regressions helps ensure that we extract underlying trends in variables and means that the model can capture the effects of economic cycles over a 1- to 2-year horizon. After that the model reverts to trends. Although randomness is added to reflect uncertainty, there are no economic cycles in the model beyond the first 1 to 2 years.

[12] All age-specific probabilities used in the model are fixed, for example.

SENSE PARTNERS

DATA LOGIC ACTION