# Far North District population projections

## For Far North District Council

May 2022

Infometrics
Economics put simply

## Authorship

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# Table of Contents

# Introduction

Infometrics has been commissioned by Far North District Council (FNDC) to produce projections of population, households, and dwellings to support a range of planning activities. This report explores these projections – explaining the methodology and historic trends and detailing the projections at a district and sub-district level. We have also conducted an analysis of seasonal population variation by analysing wastewater flow data.

## Objective

Provision of accurate, long-term, sub-district projections for FNDC to inform a range of critical functions, such as planning for demand for housing and business land, water infrastructure demand modelling, the development of the 2024-2034 long-term plan, infrastructure investment decisions and managing future growth.

# Our approach

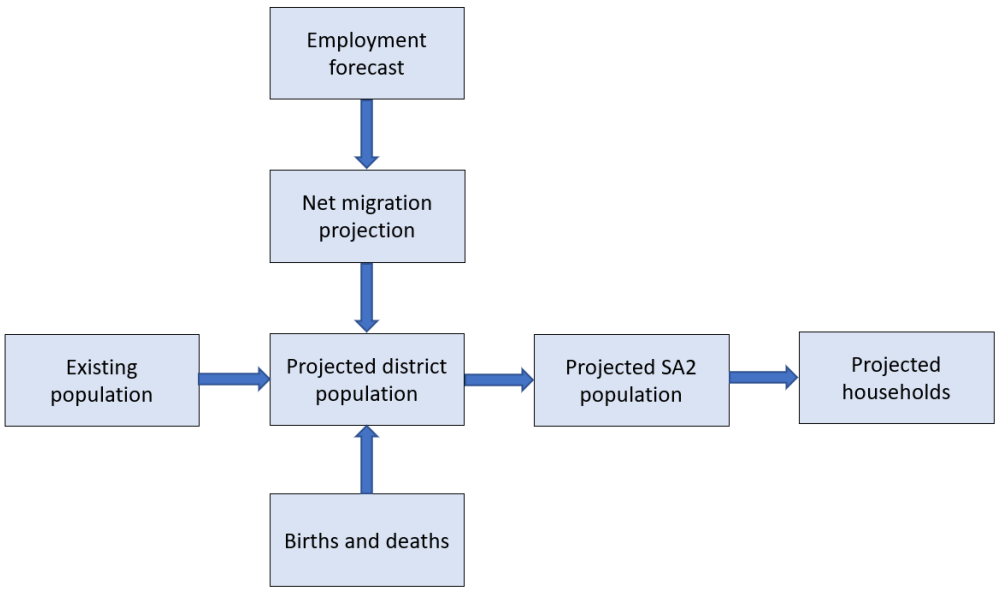
Our population projection approach follows a traditional cohort component projection approach, in which the population is broken up into age and gender cohorts. Each cohort is analysed and projected separately – considering the probabilities of different life events for each cohort in each five-year period. The life events include fertility, mortality, migration, household formation, and labour force participation. We also consider how these probabilities have changed over time and how they may change in future – for example, how labour force participation has risen among older age groups as life expectancy has extended over time.

Our key point of difference for our population projections is employment forecasts to inform net migration. We consider employment growth and labour force participation to assess labour force shortfalls in each region, which indicates how net migration will be distributed within the country. Consequently, these population projections are essentially informed by the economic prospects of the district.

We project population at a districtwide scale first, in consideration of demographic processes and employment growth. Then, we project population at a Statistical Area 2 (SA2) or sub-district scale in consideration of the capacity for household growth in each SA2 area and historic trends.

Our projection approach is summarised in Figure 1 below, with each facet of our approach described in greater detail in the Appendix.

**Figure 1**



# Economy

## Employment to grow in short term, then flatten

Far North District employment has grown strongly in recent years, averaging 2.8% per annum between 2014 and 2020, reaching 25,810 as COVID-19 struck New Zealand. Disruption associated with COVID-19 led to slower employment growth, but no decline in job numbers in the Far North. For the remainder of the 2020s, employment growth is forecast to average 1.3% per annum, reaching a level of 29,232 in 2030. Employment is forecast to peak at 30,520 in 2039, and ease slightly thereafter. The drivers of this decline are detailed in the next section.

**Graph 1**


Our forecasts for employment are driven by a combination of historic trends and our forecasts for the future. This includes assumptions around environmental regulation (discussed below in the context of agriculture and forestry) and of linear adoption of automation technology, which will adversely affect employment in some industries.

## Employment growth driven by services

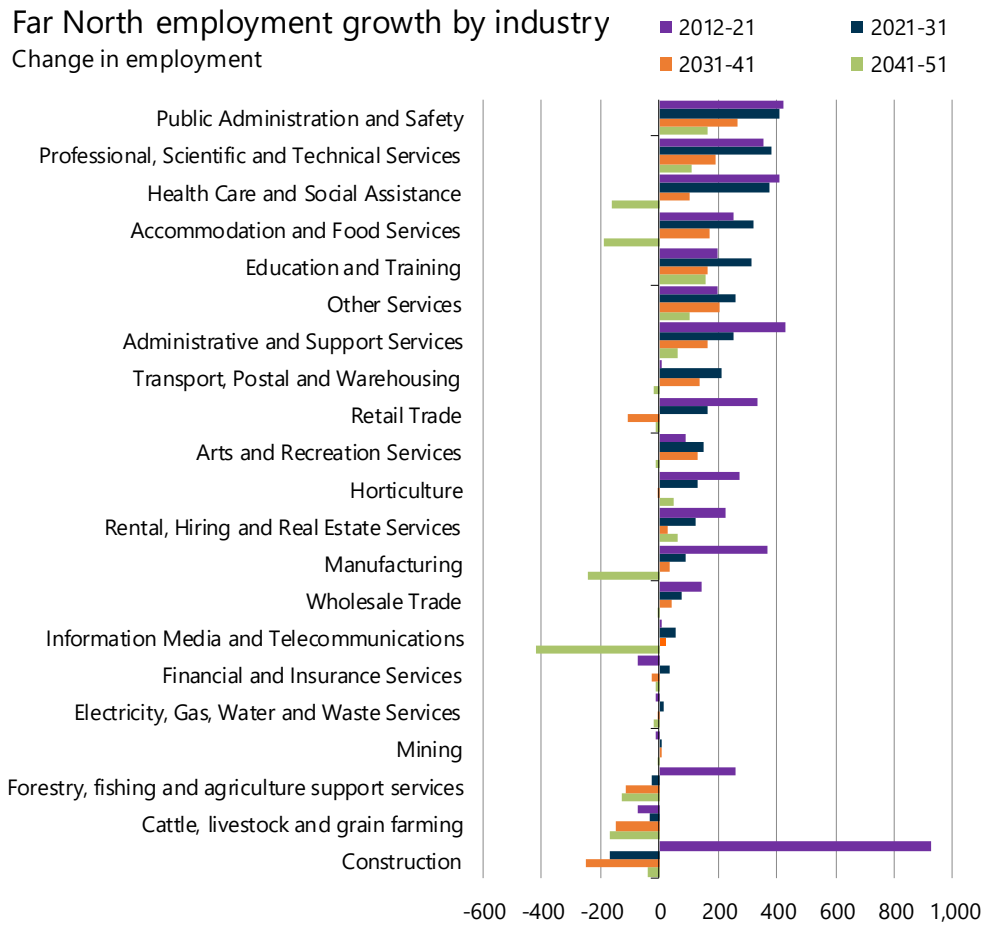
Employment growth in the Far North is forecast to be driven by service industries, both over the short and long term. The largest industries for employment growth in the 2021 to 2031 period are, public administration (408 new jobs), professional services (383), health care (376), accommodation and food services (320), and education and training (315). These service industries were among the strongest growing industries in the Far North over 2012-21, and are expected to continue growing into the 2030s and 2040s, with the exception of health care and accommodation and food services, which will ease slightly in the 2040s.

Construction made the greatest contribution to employment growth over the 2012-21 period, adding 928 jobs. However, as population growth starts to flatten out, demand for construction is forecast to ease too, partially unwinding the growth of the past decade.

Our employment forecast is underpinned by key assumptions around the policy settings for agriculture and forestry. This includes the assumption that agriculture will be included in the emissions trading scheme (or a broadly equivalent regime) by 2025, and the carbon price will reach $100/tCO$^2$ by 2030, and steadily increase to $200/tCO$^2$ by 2050. We have also assumed that freshwater regulations will encourage a reduction in cattle and livestock farming, driven by the National Policy Statement for Freshwater Management. The effect of these changes is most keenly felt in cattle and livestock farming (including dairy cattle farming.

Employment in cattle and livestock farming fell between 2012 and 2021, and is projected to continue falling, accelerating after 2030. The extent of forestry is projected to grow, driven by a rising carbon price and utilising land being freed up from cattle and livestock farming. However, forestry creates only a modest employment boost, which fails to offset the fall in demand for support services from cattle and livestock farming, meaning that forestry, fishing and agriculture support services are projected to decline overall. Horticulture has been expanding in the Far North, aided by strong returns for the likes of kiwifruit and avocados. The horticulture industry grew 275 jobs in the Far North between 2012 and 2021. Horticulture is expected to continue growing over the next decade aided by the Mid North water scheme, adding 132 jobs between 2021 and 2031.

**Graph 2**



## Shift in industries will affect parts of the district differently

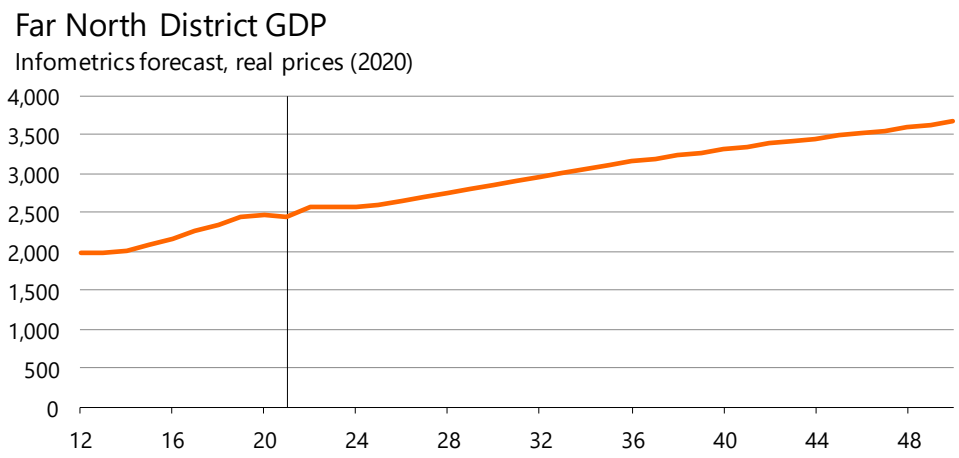
Although we haven't projected employment at a sub-district level, the projected shift in the industry composition of the Far North economy does have implications for sub-district population growth. Growth in horticulture is more likely to be located near the district's main centres of Kaikohe, Kerikeri, and Kaitaia as these represent the largest labour pools, particularly Kaikohe due to Te Tai Tokerau Water Trust's Mid North water scheme. The headwinds of environmental regulation and carbon pricing faced by livestock farming may adversely affect employment in more remote parts of the district. Strong growth across a variety of service industries is also likely to take place in the three main centres, again driving population growth in the district's main centres.

## Steady GDP growth over time

The Far North District has experienced a period of strong growth in recent years, with annual GDP growth averaging 3.1% per annum between 2014 and 2020. GDP was only slightly dented by COVID-19, down 0.3% in the year to March 2021. Moderate growth is forecast for the rest of this decade, averaging 1.7% per annum. From 2030 to 2050, the district's GDP is forecast to grow by an average of 1.3%. This growth will take overall economic activity from $2,450m in 2022 to $3,670m in 2050.

GDP in the Far North is forecast to grow faster than employment over the long term due to ongoing investment in capital across all businesses, which increases the productivity of workers. Furthermore, shifts from lower to higher-value added industries will grow GDP, such as from sheep and beef farming to horticulture.

**Graph 3**

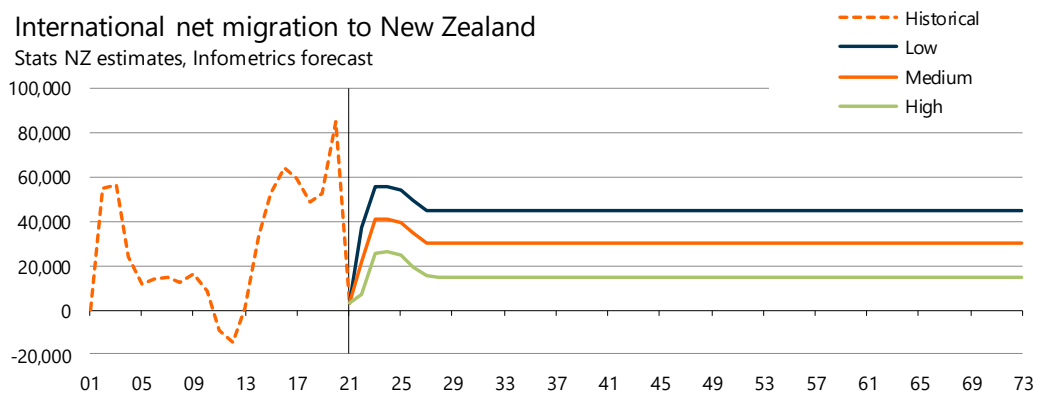


# Population

## International net migration to rise in near term

International net migration to New Zealand plunged in 2021, after reaching a record high in 2016, and a further record high in 2020 as expat New Zealanders rushed home ahead of COVID-19 border restrictions (Graph 4). Net migration plunged in 2021 but is forecast to recover strongly through 2022 as New Zealand's international borders are progressively reopened, and the 2021 Resident Visa reduces outflows of migrant workers. Net migration is forecast to peak at 45,000 in 2023 in our medium forecast, before settling at our long-term forecast level of 30,000 per annum from 2027 onwards. This reflects that under our forecast of steady employment growth projected and an ageing population, we expect sustained positive net migration over the long term. Although New Zealand doesn't currently have a long-term immigration strategy, we expect that labour market pressures will persuade future governments to enable sustained, moderate net migration flows through favourable migration settings. We don't expect net migration to return to the highs observed in the past decade, as it has increasingly been acknowledged that migration running ahead of growth in public infrastructure has come to the detriment of the wider community[1].

**Graph 4**



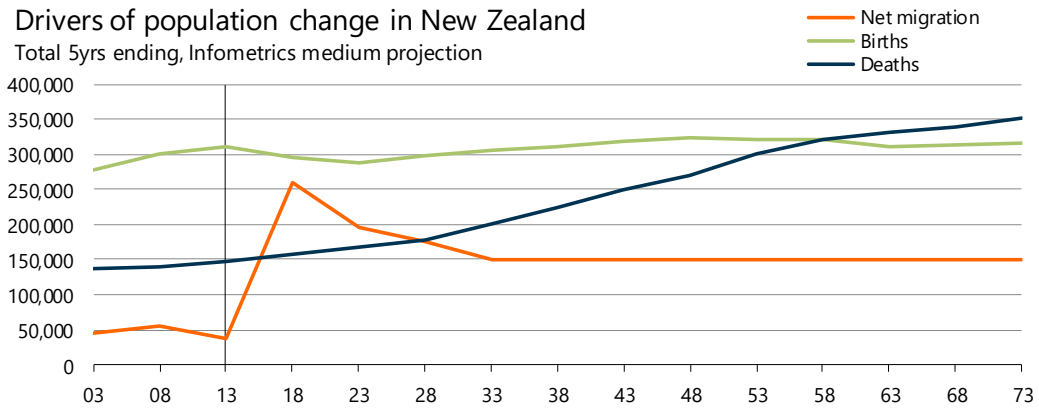

## Drivers of population growth shift over time

Shifts in international net migration have been the most noteworthy driver of population growth in the past decade nationally, owing to its dramatic volatility (Graph 5). However, this belies the long-term ageing of New Zealand's population which is closing the gap between births and deaths, known as natural increase. Births are projected to remain broadly steady in numeric terms, at or above 300,000 per five-year period, with a growing population offsetting a declining fertility rate. Deaths are projected to grow steadily as burgeoning older age groups outpace decreasing mortality rates. As natural increase decreases, with deaths growing faster than births, population growth will slow and become increasingly dependent on net migration. Nationally, deaths are projected

[1] New Zealand Productivity Commission. (2021). Immigration – Fit for the future: Preliminary findings and recommendations. NZPC. Available from https://www.productivity.govt.nz/inquiries/immigration-settings

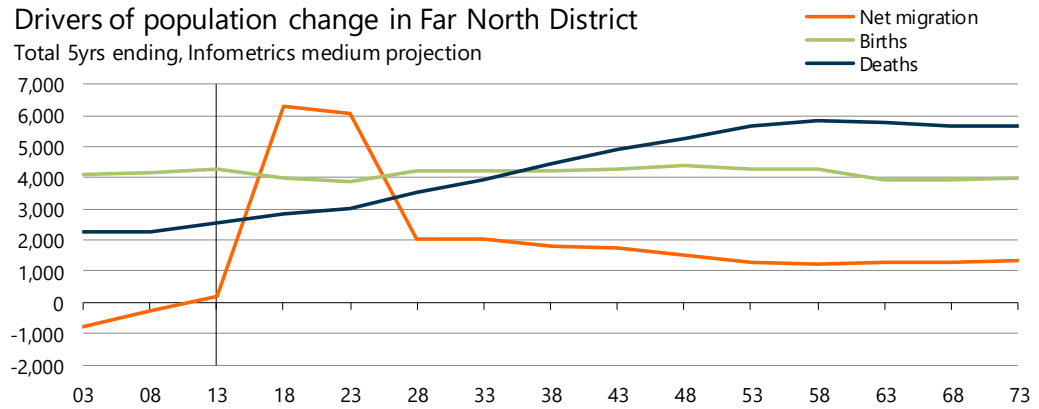
to outnumber births in the 2050s, at which point New Zealand's will be entirely reliant on net migration to continue growing and to avoid decline.

### Graph 5




Natural increase in the Far North is projected to turn negative in the 2030s, with a growing number of deaths outpacing steady numbers of births (Graph 6). The Far North District experienced a more pronounced rise in net migration in the past decade, driven by both higher volumes of international net migration and a higher share of migration going to provincial areas rather than cities. As a consequence of the sharp rise in net migration to the Far North in the past decade, in the coming decade net migration to the Far North will fall more sharply than at the national level. Nonetheless, net migration to the Far North is projected to remain positive over the projection period, much stronger than the net outflows experienced in the 2000s. This reflects the district's need for workers to migrate to fill vacancies created through growth and retirement.

### Graph 6



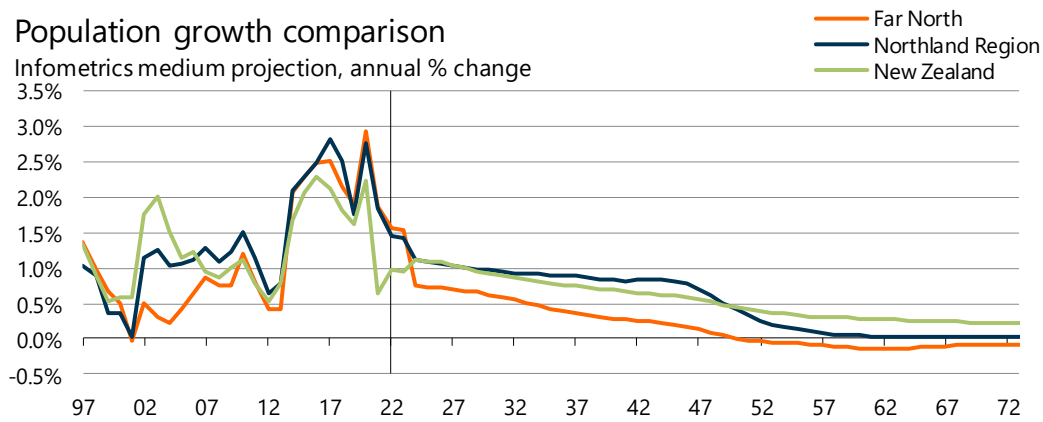

Net migration to the Far North district is projected to be positive in most age groups, with the strongest net migration gain in the 45-54-year-old age group, reflecting the district's attraction as a pre-retirement destination. Net migration is projected to be strongly negative in the 15-24-year-old age group, reflecting a long-standing trend of young people leaving the district for education, employment and travel after completing their secondary education. Net migration is projected to be weakly negative in the 75-

years-and-older age group, reflecting historic trends of older persons leaving the district to be closer to specialist medical care.

## Population growth is front loaded

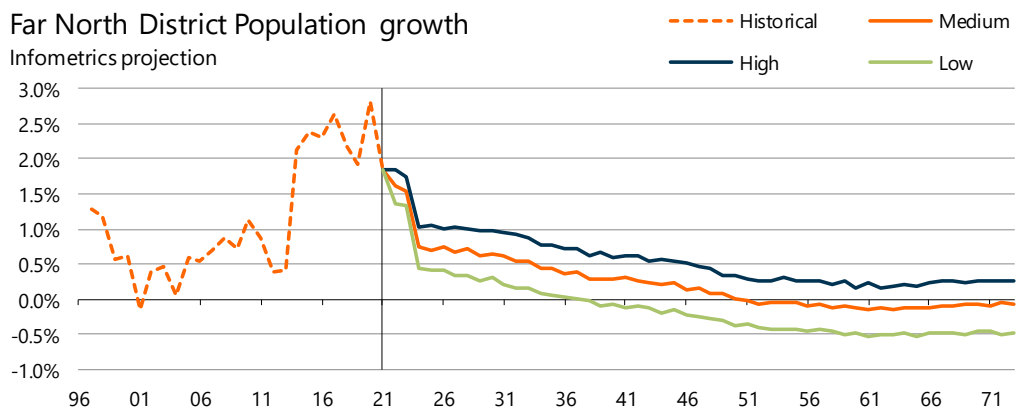
Far North District's annual population growth fluctuated between 0% and 1% through the 2000s, lagging Northland and New Zealand overall. Far North's growth picked up in the 2010s, closely tracking Northland and New Zealand with growth between 2% and 3% in the mid-2010s (Graph 8). Far North's growth eased to a still-strong 1.8% in 2021 as international net migration dried up amid COVID-19 border restrictions. Under the medium scenario, Far North population growth is projected to remain above 1% for 2022 and 2023, as the border reopening and 2021 Migrant Visa is expected to sustain strongly positive international net migration. From 2024 onwards, population growth in Far North is projected to slow down compared to Northland and New Zealand, but remain well above the Far North's growth in the 2000's. Over the longer term, population growth in the Far North is projected to lag Northland and New Zealand. This reflects underlying economic shifts, as service-based industries expand and primary industries decline, which lends to stronger growth in larger centres.

**Graph 7**




From 2024 onwards, Far North's population growth is projected to diverge more widely across the three scenarios. Under the medium scenario, population growth is set to average 0.7% per annum over the 2024-2034 period, tapering until growth turns slightly negative in 2050 (Graph 8). At this point, the district is highly reliant on net migration to sustain the population level, however, employment is also forecast to be easing at this point, meaning that there is limited pull for migrants. Annual population growth is projected to stay weakly negative for the remainder of the projection period in the medium scenario.

**Graph 8**



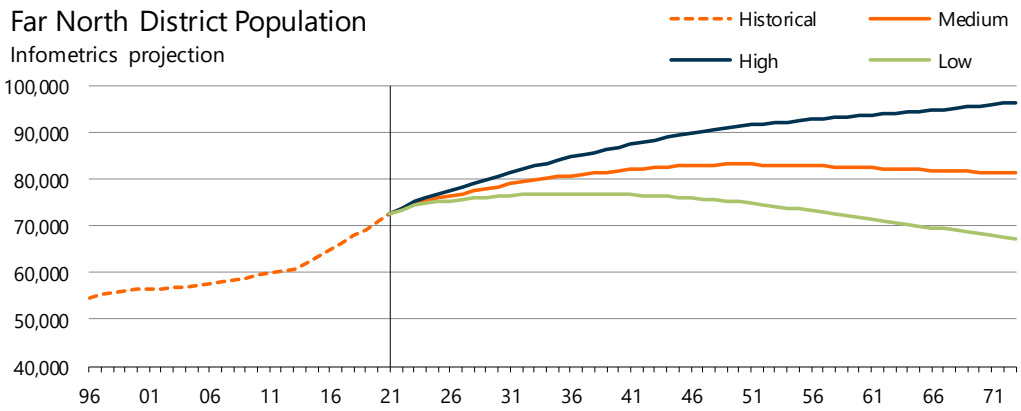

Under the low scenario, population growth is projected to average 0.3% for the 2024-2034 period, easing until it turns negative in 2039, and remaining negative for the remainder of the projection period. This reflects lower fertility, higher mortality, and weaker net migration than in the medium scenario. Under the high scenario, population growth is projected to stay positive for the entire projection period, averaging 1.0% per annum for the 2024-2034 period, and siting above 0.5% until 2048. The high scenario reflects higher fertility, lower mortality and higher net migration than the medium scenario.

Across all three scenarios, the majority of the Far North's population growth over a 30- and 50-year horizon occurs within the first ten years.

## Population peaks at 83,200 in 2049

Far North District's population grew gradually from 54,500 in 1996 to 60,600 in 2013, then rocketed to 72,500 in 2021 (Graph 9). Under the medium projection, the population is projected to grow moderately to reach 80,200 in 2034, followed by slow growth until a peak of 83,200 in 2049. Thereafter, the population is projected to gently ease to 81,500 in 2073.

**Graph 9**



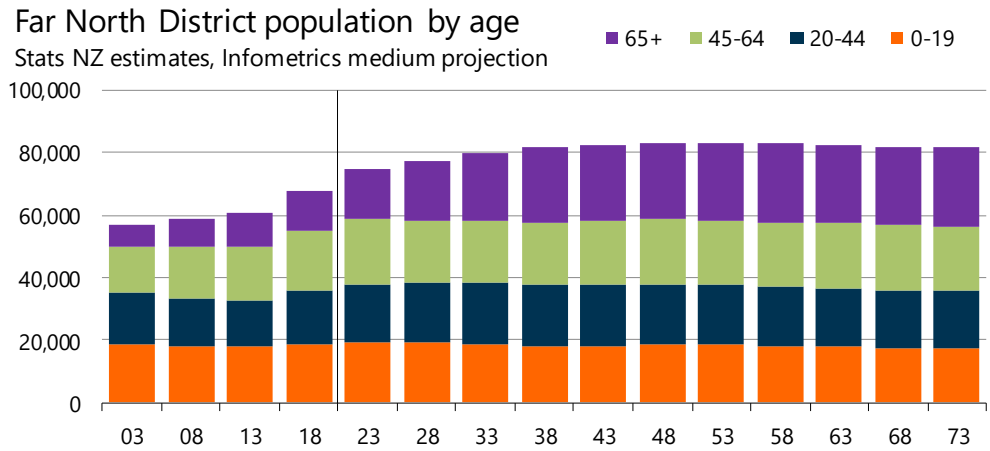

Under the low scenario, the population is projected to grow slowly to reach 76,900 in 2034, then start declining from 2039 onwards, to reach 67,400 at 2073, slightly under the

district's current population. Under the high scenario, the district's population is projected to grow continuously, reaching 83,500 in 2034, followed by further growth to reach 96,600 in 2073.

## Older age group grows, younger age groups hold steady

The 65-years-and-older age group has been the Far North's fastest growing in the past two decades, growing 113% between 2001 to 2021. It will continue to be the fastest growing age group in the coming two decades, projected to grow 64% between 2021 and 2041 under the medium scenario as the last of the baby boomer generation transitions into the age group. This age group is projected to grow from 14,800 in 2021 to 24,300 in 2041, and remain around this level for the remainder of the projection period (Graph 10). The 45-64-year-old age group grew strongly in the 2000s as the younger part of the baby boomer generation moved into the age group. Accordingly, this age group is not expected to grow further as it will have significant outflows, holding at around 20,000 for the remainder of the projection period. The 20-44-year-old age group grew strongly in the past decade, from 15,200 in 2011 to 18,500 in 2021, gaining from positive net migration to the district. The 20-44-year-old age group is projected to remain around their current size for the projection period, reflective of the more modest levels of net migration projected. The 0-19-year-old age group has been very steady over time, as is projected to remain near its current level of 19,300 throughout the projection period.

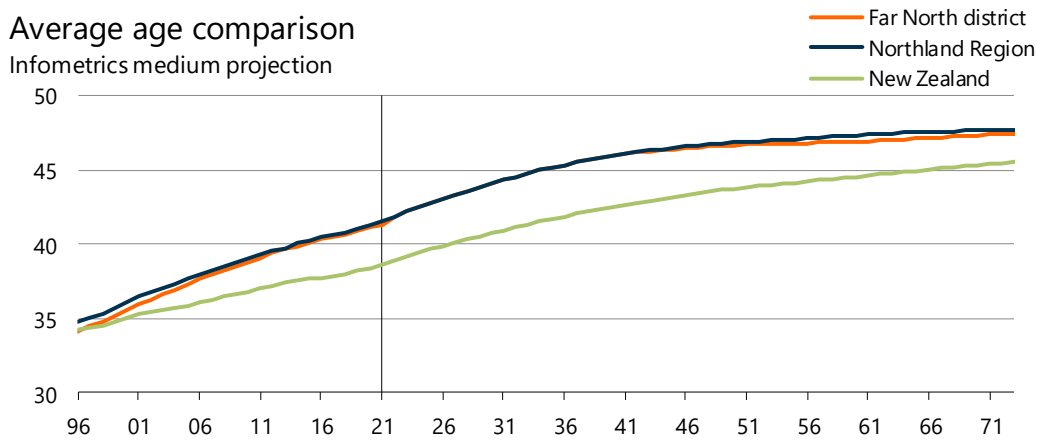
**Graph 10**




## Average age rises rapidly

As a result of out-sized growth in the 65-years-and-over age group, the average age of the population is projected to rise strongly over the next 20 years. The average age of the Far North population in in 2021 was 41 years, and this is projected to rise to 44 years in 2031 and 46 in 2041 (Graph 11). Far North's average age closely follows the Northland Region average, and both are rising much faster than the New Zealand average.

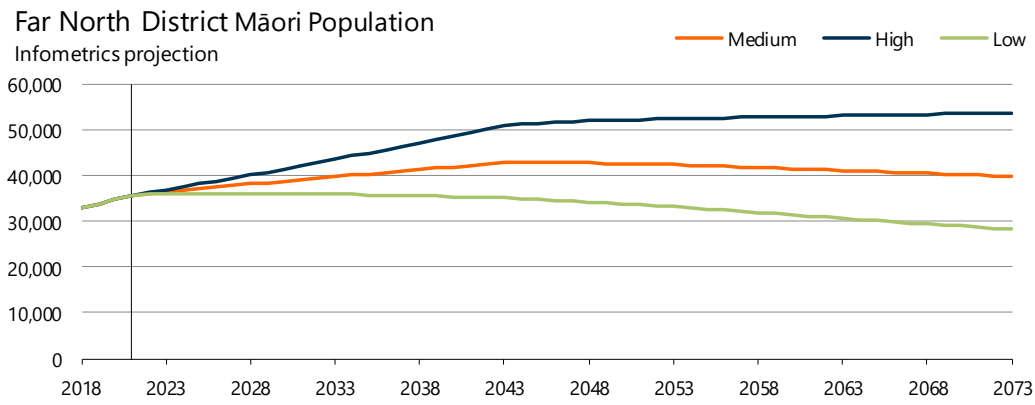
**Graph 11**




## Māori population

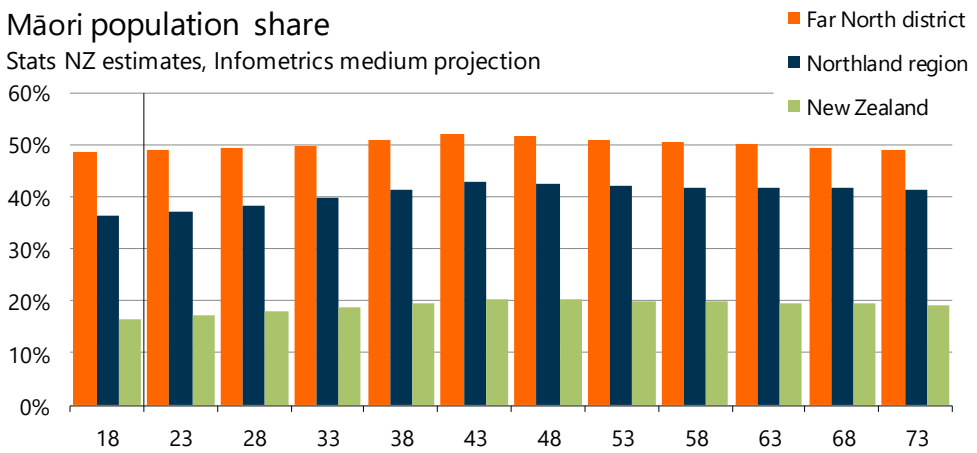
From the 2018 Census, it is estimated that 33,100 people in the Far North identified with Māori ethnicity (Graph 12), 49% of the total population in the district (Graph 13). This is projected to grow to 40,200 (50%) in 2034 under the medium scenario, 44,400 (53%) under the high scenario, and 36,000 (47%) under the low scenario. By 2051, the Māori population in the Far North is projected to number 42,600 (51%) under the medium scenario, 52,400 (57%) under the high scenario, and 33,700 (45%) under the low scenario.

**Graph 12**




The proportion of the population identifying with Māori ethnicity in Far North district is projected to be relatively steady over time, rising from 49% in 2018 to 52% in 2043, and back to 49% in 2073. Māori make up a lesser share of the population across Northland overall (36% in 2018) and New Zealand (16%). The Māori population is projected to grow more strongly across Northland and New Zealand than in the Far North.

**Graph 13**


Māori population share
Stats NZ estimates, Infometrics medium projection
Far North district
Northland region
New Zealand
60%
50%
40%
30%
20%
10%
0%
18
23
28
33
38
43
48
53
58
63
68
73

# Households

A household is a grouping of individuals and/or families living in the same dwelling and sharing facilities with each other.

## Household projections are theoretical

Households and average household size are estimated based on projected changes in the sex and age structure of the population (such as a growing older-age population) and trends in household formation (such as women deferring childbirth). This provides a theoretical estimate of the number of households, however, the actual number of households will depend on a sufficient number of dwellings being available. If fewer dwellings are made available, for example due to lower levels of new dwelling construction, then fewer households will be able to form, and the average household size may be higher. As a practical example, we might expect a couple with one child to form their own single-family household, consisting of three occupants. However, if the couple is unable to obtain suitable dwelling, they may move in with one of their sets of parents, forming a multi-family household with five occupants.

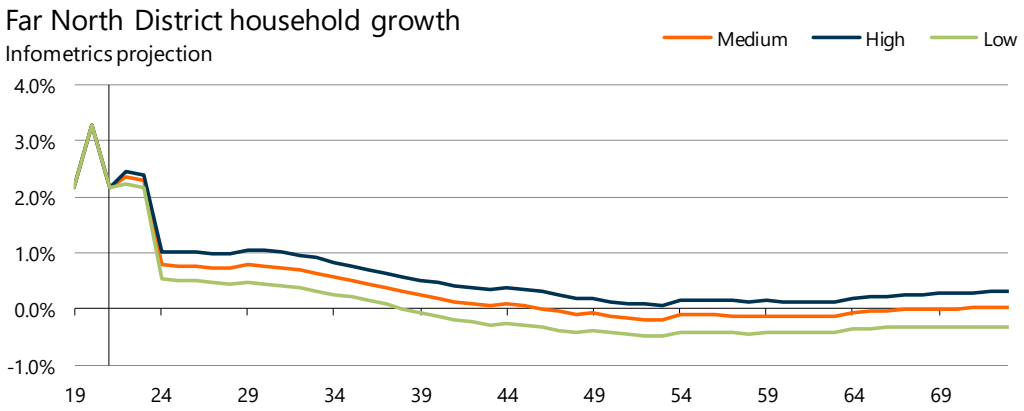
## Average household size to remain relatively steady

Over the projection period, the average household size in the Far North is projected to ebb and flow within the 2.6 to 2.7 persons per household range in the medium scenario. The strongly ageing population will keep average household size towards the lower end of this range until around 2040, driven by the baby boomer generation forming typically small households of couples or singles in their retirement years. After this point, the average household size will drift back towards the upper end of the range. Average household size is projected to be slightly higher in the high scenario, reflecting that the higher fertility assumption would lead to slightly larger family households, and conversely, average household is projected to be slightly lower in the low scenario. Overall, the relatively steady average household size across all three scenarios means that household growth will largely mirror population growth.

## Household growth set to moderate

The number of households in the Far North is estimated to have grown by over 2% per annum since the 2018 Census, driven by strong population growth (Graph 14). Household growth is projected to ease in the coming years as population growth settles to more modest levels, across all three scenarios. Under the medium scenario, household growth is projected to moderate to an average of 0.7% per annum over the 2024-2034 period. Thereafter, household growth is projected to ease slightly before turning weakly negative from 2048 onwards. The high scenario mirrors this pattern at a higher level, averaging 1.0% per annum growth over the 2024-2034 period before easing, although remaining positive for the entire projection period. Under the low scenario, household growth averages 0.4% over the 2024-2034 period, then turns negative in 2039 and remains negative for the remainder of the projection period.

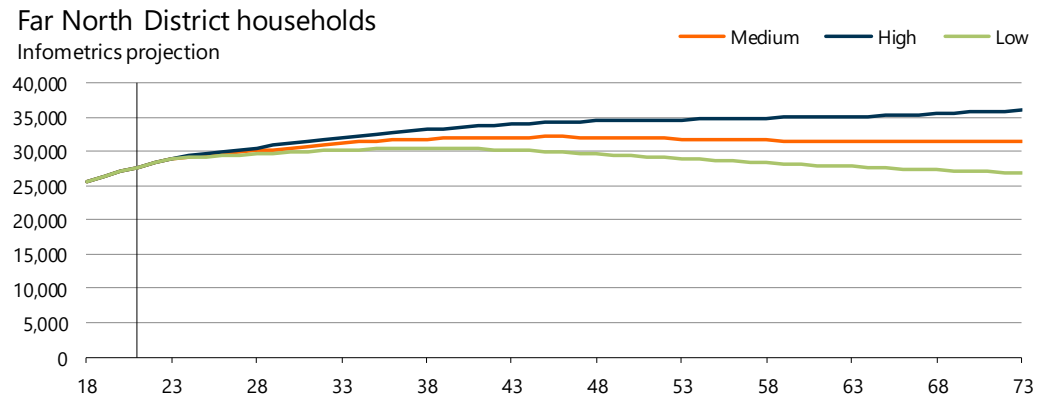
**Graph 14**




## Households peak at 32,100 in 2046

The number of households in the Far North is projected under the medium scenario to grow from 25,700 in 2018 to 31,400 in 2034, before peaking at 32,100 in 2046 (Graph 15). The number of households is then projected to ease back slightly, reaching 31,400 in 2073.

**Graph 15**




Under the high scenario, the number of households is projected to reach 32,400 in 2034, growing slowly thereafter to reach 36,000 in 2073. Under the low scenario, the number of households is projected to grow slowly to reach 30,300 in 2034, then gradually decline to 26,900 in 2073.

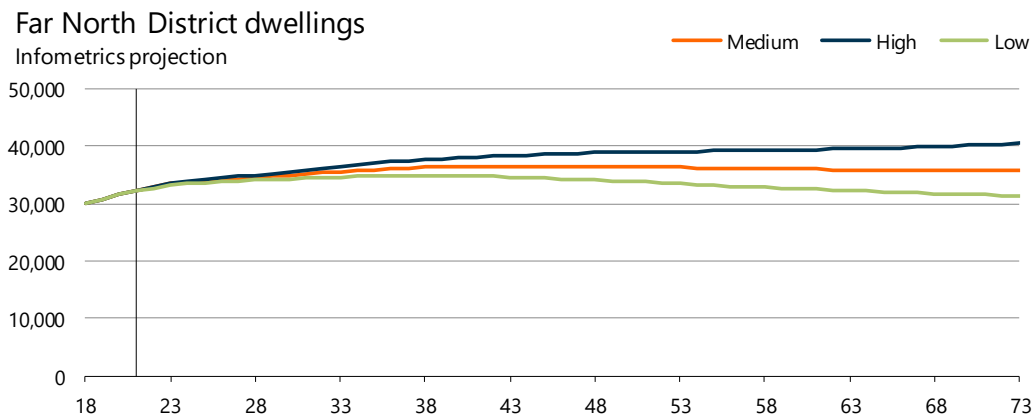
# Dwellings

Dwellings include both occupied and unoccupied dwellings, and both are counted in the five-yearly national Census. We project growth in occupied dwellings based on growth in the number of households. We have assumed that the number of unoccupied dwellings (such as holiday houses) will remain constant into the future as inconsistencies between Censuses mean that we are unable to establish the historical trend. This means the growth in the total number of dwellings is solely driven by our household forecast.

## Dwellings peak at 36,600 in 2046

The number of dwellings in the Far North is projected to grow from 30,200 in 2018 to 35,800 in 2034, before peaking at 36,600 in 2046, easing thereafter to reach 35,800 in 2073 (Graph 16). Under the high scenario, the number of dwellings is projected to grow to 36,800 in 2034, growing further to reach 40,500 in 2073. Under the low scenario, the number of dwellings is projected to reach 34,800 in 2034, peak at 34,900 in 2038, and decline to 31,400 in 2073.

**Graph 16**



# Sub-district projections

Projections were produced for sub-district areas within the Far North using a variety of approaches. Stats NZ-defined Statistical Area 2 (SA2) were used as a building block. The Far North District is made up of 47 SA2 areas, each with an average population of 1,540 in 2018. We have produced a full demographic projection for each SA2 area, considering the current age and sex structure of the population, and projected births, deaths and household formation. We apportion the district's net migration to each of the 47 SA2s by considering historic trends in population and residential building consents as well as the likelihood and capacity of future growth. Likelihood and capacity of future growth was developed through analysis of council data and a workshop with council staff, and includes the following factors:

- **Known developments.** A list of specific known developments was provided by FNDC, which included a selection of developments at different stages of the resource consenting process. This was considered a very good indication of near-term population growth, and was used to indicate the distribution of growth across the district over 2022 and 2023.

  **Availability of residential land.** Analysis from FNDC on latent capacity for residential development was used to quantify the availability of residential land for development. This included land which was either empty and zoned for residential activities or partially developed and suitable for subdivision. Generally speaking, the supply of zoned land wasn't a binding constraint on sub-district population growth, although it was used as a signal to apportion growth across the district.

- **Water and wastewater capacity.** This was based on 'order of magnitude' studies commissioned by FNDC. Overall, this work indicated that there was generally capacity for growth available in the District's water schemes (with the exception of Rawene), although most wastewater schemes were generally approaching or exceeding their theoretical capacity. Given that capacity was only identified as a loose constraint and in many cases investment for capacity enhancements was budgeted, it was not used to constrain development, except in the case of Rawene.

- **Likelihood of development**. Likelihood of development was considered through discussion with council staff. Staff advised that climate change will increase the exposure of Paihia, Kaeo and Hokianga to natural hazards, and thus limit the likelihood of further development in these areas. Strong prospects for economic growth in Ngawha were expected to underpin population growth in Kaikohe. The recent completion of Kerikeri's wastewater treatment plant, coupled with the potential for more intensive zoning provisions is expected to enable stronger urban growth in the Kerikeri-Waipapa area, and coupled with an expansion of horticultural zoning, is expected to reduce peri-urban growth in the area. Council staff also advised that efforts to enable papakāinga, both within council through the draft District Plan, and more broadly with central government efforts to overcome funding barriers, may lead to increased housing development in Māori-owned land. We have factored this into the projections by allowing slightly higher growth in rural areas of the district,

underpinned by slightly higher net migration, reflecting Māori returning to their whenua.

# Kaitaia and surrounds

Across Kaitaia and surrounds, growth is projected to be concentrated in the Kaitaia urban area, which is captured in the Kaitaia East and West SA2 areas, as well as Tangonge and Rangithi SA2 which adjoin Kaitaia. Growth in the Kaitaia urban area is also expected to spill over to Ahipara and Awanui (Rangaunu Harbour SA2) to a lesser extent. The population of Kaitaia (East and West) is projected to grow from 6,300 in 2021 to 7,100 in 2034, and 8,100 in 2073.

## Table 1

**Population projections for Kaitaia and surrounds**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Ahipara | 1,417 | 109 | 9 | 1 |
| Herekino-Takahue | 1,045 | 80 | 2 | -5 |
| Kaitaia East | 2,642 | 203 | 21 | 12 |
| Kaitaia West | 3,694 | 284 | 19 | 24 |
| North Cape | 1,834 | 141 | 5 | 2 |
| Peria | 1,261 | 97 | 4 | -1 |
| Rangaunu Harbour | 2,592 | 199 | 15 | 10 |
| Rangitihi | 975 | 75 | -3 | 0 |
| Tangonge | 1,221 | 94 | 4 | -1 |

**Household projections for Kaitaia and surrounds**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Ahipara | 536 | 41 | 4 | 0 |
| Herekino-Takahue | 395 | 30 | 2 | -2 |
| Kaitaia East | 863 | 66 | 11 | 4 |
| Kaitaia West | 1,252 | 96 | 9 | 9 |
| North Cape | 722 | 56 | 3 | -1 |
| Peria | 489 | 38 | 3 | -1 |
| Rangaunu Harbour | 944 | 73 | 7 | 2 |
| Rangitihi | 371 | 29 | 0 | 0 |
| Tangonge | 453 | 35 | 2 | 0 |

**Dwelling projections for Kaitaia and surrounds**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Ahipara | 633 | 49 | 4 | 0 |
| Herekino-Takahue | 463 | 36 | 2 | -2 |
| Kaitaia East | 880 | 68 | 11 | 4 |
| Kaitaia West | 1,255 | 97 | 9 | 9 |
| North Cape | 946 | 73 | 3 | -1 |
| Peria | 565 | 43 | 3 | -1 |
| Rangaunu Harbour | 1,058 | 81 | 7 | 2 |
| Rangitihi | 383 | 29 | 0 | 0 |
| Tangonge | 489 | 38 | 2 | 0 |

# Doubtless Bay

Growth in the Doubtless Bay area is projected to be strongest in the Taumarumaru SA2 which includes Taipa and Coopers Beach. Growth in Taemaro-Oruaiti is limited in part by a lack of available zoned land in the main settlement of Hihi. Growth in Karikari Peninsula SA2 is expected to be concentrated in Whatuwhiwhi and Tokerau Beach.

Across Doubtless Bay, and particularly Karikari Peninsula, dwellings greatly outnumber households – this reflects the prevalence of holiday houses in this area. We have assumed that there will be no further growth in holiday houses in future, largely due to a lack of data to inform any other assumption. This means that projected dwelling growth is driven solely by projected population and household growth.

Estimates for Hihi, Whatuwhiwhi (including Tokerau Beach) and Rangiputa settlements are detailed in the Wastewater service areas section.

## Table 2

**Population projections for Doubtless Bay**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Karikari Peninsula | 1,384 | 106 | 5 | 3 |
| Oruru-Parapara | 971 | 75 | 3 | 0 |
| Taemaro-Oruaiti | 1,041 | 80 | 4 | -2 |
| Taumarumaru | 2,586 | 199 | 27 | 10 |

**Household projections for Doubtless Bay**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Karikari Peninsula | 581 | 45 | 2 | -1 |
| Oruru-Parapara | 379 | 29 | 3 | 0 |
| Taemaro-Oruaiti | 431 | 33 | 2 | -1 |
| Taumarumaru | 1,109 | 85 | 8 | -1 |

**Dwelling projections for Doubtless Bay**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Karikari Peninsula | 1,198 | 92 | 2 | -1 |
| Oruru-Parapara | 421 | 32 | 3 | 0 |
| Taemaro-Oruaiti | 606 | 47 | 2 | -1 |
| Taumarumaru | 1,581 | 122 | 8 | -1 |

# Kaeo/Whangaroa

Population growth in the Kaeo/Whangaroa area is projected to be modest as the area is apart from the Far North's main economic centres. Growth in Kaeo specifically is also to be limited by the threat of flooding, which will likely be exacerbated by climate change.

The Whakapaku and Whakarara areas are dominated by small settlements, predominantly consisting of holiday houses. Estimates for Matauri, Matauri Bay, Ota Point, Taupo Bay, Tauranga Bay, Te Ngaire and Totara Point settlements are detailed in the Error! Reference source not found. section. In these areas, dwellings greatly o utnumber households – this reflects the prevalence of holiday houses in this area. We have assumed that there will be no further growth in holiday houses in future, largely due to a lack of data to inform any other assumption. This means that projected dwelling growth is driven solely by projected population and household growth.

## Table 3

**Population projections for Kaeo/Whangaroa**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kaeo | 1,348 | 10 | 0 | -9 |
| Whakapaku | 785 | -1 | -4 | -9 |
| Whakarara | 1,477 | 6 | 0 | -4 |

**Household projections for Kaeo/Whangaroa**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kaeo | 504 | 39 | 4 | 0 |
| Whakapaku | 315 | 24 | 1 | -2 |
| Whakarara | 591 | 45 | 2 | -1 |

**Dwelling projections for Kaeo/Whangaroa**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kaeo | 581 | 45 | 4 | 0 |
| Whakapaku | 530 | 41 | 1 | -2 |
| Whakarara | 780 | 60 | 2 | -1 |

# Hokianga

Population growth in the Hokianga Harbour area is projected to be modest, with the majority taking place before 2034. This reflects the older population of the area, and the fact that Hokianga's main settlements are apart from the Far North's main economic centres which are driving growth.

Across the Hokianga area, dwellings greatly outnumber households – this reflects the prevalence of holiday houses in this area. We have assumed that there will be no further growth in holiday houses in future, largely due to a lack of data to inform a different assumption. This means that projected dwelling growth is driven solely by projected population and household growth.

Estimates for Kohukohu, Rawene and Opononi are detailed in the **Wastewater service areas** section. Estimates for Mitimiti, Panguru, Horeke, Koutu and Waimamaku are detailed in the **Settlements** section.

## Table 4

**Population projections for Hokianga**

Stats NZ estimate, Infometrics medium projection

| | | Annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Hokianga North | 962 | 2 | -1 | -8 |
| Hokianga South | 1,363 | 2 | -1 | -5 |
| Kohukohu-Broadwood | 817 | -1 | -5 | -7 |
| Omahuta Forest-Horeke | 1,170 | 5 | 1 | -6 |
| Waima Forest | 1,175 | -8 | 1 | -5 |
| Waipoua Forest | 1,297 | 0 | -4 | -5 |

**Household projections for Hokianga**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Hokianga North | 342 | 26 | 3 | 0 |
| Hokianga South | 523 | 40 | 1 | -1 |
| Kohukohu-Broadwood | 332 | 26 | 1 | -2 |
| Omahuta Forest-Horeke | 413 | 32 | 3 | 0 |
| Waima Forest | 402 | 31 | 0 | 1 |
| Waipoua Forest | 531 | 41 | 0 | -2 |

**Dwelling projections for Hokianga**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Hokianga North | 468 | 36 | 3 | 0 |
| Hokianga South | 660 | 51 | 1 | -1 |
| Kohukohu-Broadwood | 403 | 31 | 1 | -2 |
| Omahuta Forest-Horeke | 546 | 42 | 3 | 0 |
| Waima Forest | 403 | 31 | 0 | 1 |
| Waipoua Forest | 796 | 61 | 0 | -2 |

# Kerikeri-Waipapa

The Kerikeri-Waipapa area is expected to continue accommodating the lion's share of Far North District growth over the next 50 years. The Kerikeri-Waipapa structure plan area, which includes a portion of the eight SA2 areas listed in Table 5, is estimated to accommodate 19% of the Far North's population in 2021. This is projected to grow to 25% by 2073, as growth in the area outpaces the district overall. As per the districtwide trend, growth in the Kerikeri-Waipapa area is projected to ease over the projection period. Growth is projected to be concentrated in the urban area, particularly Kerikeri Central and Kerikeri South, and to a lesser extent Riverview and Waipapa. This reflects that the recent wastewater treatment plant upgrade will enable residential development at a higher density than has occurred in the past two decades. Furthermore, expanded horticultural zones in the draft District Plan will constrain peri-urban residential development in this area.

The Kerikeri-Waipapa structure plan area was estimated using boundaries provided by FNDC and the distribution of address points across eight SA2 areas in a similar approach to that used to estimate settlement populations. FNDC also provided boundaries for the proposed urban area within the structure plan area, and we produced estimates for the urban area based on the distribution of address points and FNDC expectations for the share of growth across the structure plan area which would take place within the urban portion of the structure plan area.

## Table 5

**Population projections for Kerikeri-Waipapa**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| **SA2 area** | **2021** | **2021-2034** | **2034-2053** | **2053-2073** |
| Kerikeri Central | 2,759 | 38 | 29 | 21 |
| Kerikeri South | 2,744 | 76 | 24 | 23 |
| Lake Manuwai-Kapiro | 2,364 | 19 | 9 | 3 |
| Puketona-Waitangi | 1,493 | 16 | -4 | -7 |
| Puketotara | 1,932 | 36 | 25 | 19 |
| Rangitane-Purerua | 1,692 | 16 | 4 | -2 |
| Riverview | 2,563 | 32 | 9 | 5 |
| Waipapa | 960 | 31 | 21 | 15 |
| ***Kerikeri-Waipapa structure plan area*** | ***13,621*** | ***1,048*** | ***158*** | ***104*** |

**Household projections for Kerikeri-Waipapa**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| **SA2 area** | **2021** | **2021-2034** | **2034-2053** | **2053-2073** |
| Kerikeri Central | 1,123 | 10 | 8 | 7 |
| Kerikeri South | 1,166 | 27 | 3 | 7 |
| Lake Manuwai-Kapiro | 950 | 8 | 0 | 0 |
| Puketona-Waitangi | 623 | 6 | -2 | -3 |
| Puketotara | 782 | 15 | 6 | 6 |
| Rangitane-Purerua | 685 | 6 | 0 | -1 |
| Riverview | 1,050 | 12 | -1 | 1 |
| Waipapa | 344 | 14 | 8 | 6 |
| ***Kerikeri-Waipapa structure plan area*** | ***5,543*** | ***85*** | ***22*** | ***24*** |

**Dwelling projections for Kerikeri-Waipapa**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| **SA2 area** | **2021** | **2021-2034** | **2034-2053** | **2053-2073** |
| Kerikeri Central | 1,248 | 10 | 8 | 7 |
| Kerikeri South | 1,204 | 27 | 3 | 7 |
| Lake Manuwai-Kapiro | 935 | 8 | 0 | 0 |
| Puketona-Waitangi | 695 | 6 | -2 | -3 |
| Puketotara | 759 | 15 | 6 | 6 |
| Rangitane-Purerua | 799 | 6 | 0 | -1 |
| Riverview | 1,081 | 12 | -1 | 1 |
| Waipapa | 347 | 14 | 8 | 6 |
| ***Kerikeri-Waipapa structure plan area*** | ***5,740*** | ***85*** | ***22*** | ***24*** |

# Kaikohe and surrounds

Population, household and dwelling growth in the Kaikohe area is projected to be concentrated in the Kaikohe SA2 areas, reflecting recent growth patterns and the attraction of water and wastewater services for residential development. Population growth in this area is underpinned by employment prospects in the Ngawha area, which is counted as being in the Ngapuhi SA2 area. Growth in this area will taper off over the projection period, reflecting the districtwide trend over time. Kaikohe SA2 is projected to continue experience positive population growth throughout the projection period.

## Table 6

**Population projections for Kaikohe and surrounds**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kaikohe | 4,824 | 28 | 12 | -10 |
| Mataraua Forest | 575 | 0 | -3 | -8 |
| Ngapuhi | 1,918 | 0 | -5 | -14 |
| Ohaeawai-Waimate North | 1,270 | 11 | 2 | -4 |
| Okaihau | 1,386 | 7 | -1 | -6 |

**Household projections for Kaikohe and surrounds**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kaikohe | 1,516 | 117 | 13 | 4 |
| Mataraua Forest | 200 | 15 | 2 | 0 |
| Ngapuhi | 718 | 55 | 2 | -2 |
| Ohaeawai-Waimate North | 499 | 38 | 3 | 0 |
| Okaihau | 510 | 39 | 3 | 0 |

**Dwelling projections for Kaikohe and surrounds**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kaikohe | 1,506 | 116 | 13 | 4 |
| Mataraua Forest | 228 | 18 | 2 | 0 |
| Ngapuhi | 620 | 48 | 2 | -2 |
| Ohaeawai-Waimate North | 518 | 40 | 3 | 0 |
| Okaihau | 538 | 41 | 3 | 0 |

# Kawakawa and surrounds

Population growth in Kawakawa and surrounds is projected to be modest going forward. Although Kawakawa and Moerewa have experienced strong growth in the past five years, this growth was largely clawing back population loss since the late 1990s, and these towns continue to record very low residential building consents which implies little potential for future growth. Growth in this area will taper off over the projection period, reflecting the districtwide trend over time.

## Table 7

**Population projections for Kawakawa and surrounds**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kawakawa | 1,589 | 122 | 2 | -2 |
| Maromaku | 840 | 65 | 5 | -1 |
| Matawaia-Taumarere | 1,552 | 119 | 8 | -3 |
| Moerewa | 1,849 | 142 | 5 | -3 |
| Pakaraka | 710 | 55 | 0 | -5 |

**Household projections for Kawakawa and surrounds**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kawakawa | 525 | 40 | 3 | 0 |
| Maromaku | 289 | 22 | 4 | 0 |
| Matawaia-Taumarere | 571 | 44 | 5 | -1 |
| Moerewa | 586 | 45 | 5 | 0 |
| Pakaraka | 274 | 21 | 1 | -1 |

**Dwelling projections for Kawakawa and surrounds**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Kawakawa | 535 | 41 | 3 | 0 |
| Maromaku | 287 | 22 | 4 | 0 |
| Matawaia-Taumarere | 610 | 47 | 5 | -1 |
| Moerewa | 518 | 40 | 5 | 0 |
| Pakaraka | 266 | 20 | 1 | -1 |

# Paihia/Russell

Population growth in the Paihia/Russell area is expected to be modest going forward, reflecting the relatively old population and limited scope for growth in many of the SA2 areas (Table 8). Resource consent information from FNDC indicates a number of planned developments in the Paihia area which will accommodate the majority of the area's growth in the short term. Over the longer term, growth across the area is projected to be lower and more concentrated in Haruru. This reflects that Haruru has the greatest availability of residentially zoned land; the potential for sea level rise to encroach on Paihia, Russell and Opua; and lower growth across the district overall in the longer term.

Across the Paihia/Russell area, dwellings greatly outnumber households – this reflects the prevalence of holiday houses in this area. We have assumed that there will be no further growth in holiday houses in future, largely due to a lack of data to inform any other assumption. This means that projected dwelling growth is driven solely by projected population and household growth.

## Table 8

**Population projections for Paihia/Russell**

Stats NZ estimate, Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Haruru | 1,223 | 94 | 23 | 10 |
| Opua | 1,253 | 96 | 4 | 2 |
| Paihia | 1,684 | 130 | 13 | -1 |
| Russell | 802 | 62 | 4 | -1 |
| Russell Forest-Rawhiti | 780 | 60 | 1 | -1 |
| Russell Peninsula | 687 | 53 | 3 | -3 |

**Household projections for Paihia/Russell**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Haruru | 489 | 38 | 9 | 4 |
| Opua | 570 | 44 | 0 | -1 |
| Paihia | 712 | 55 | 2 | 0 |
| Russell | 383 | 29 | 1 | -1 |
| Russell Forest-Rawhiti | 308 | 24 | 1 | 0 |
| Russell Peninsula | 325 | 25 | 1 | -2 |

**Dwelling projections for Paihia/Russell**

Infometrics medium projection

| | Estimate | Projected annual change | | |
|---|---|---|---|---|
| SA2 area | 2021 | 2021-2034 | 2034-2053 | 2053-2073 |
| Haruru | 517 | 40 | 9 | 4 |
| Opua | 683 | 53 | 0 | -1 |
| Paihia | 924 | 71 | 2 | 0 |
| Russell | 638 | 49 | 1 | -1 |
| Russell Forest-Rawhiti | 503 | 39 | 1 | 0 |
| Russell Peninsula | 482 | 37 | 1 | -2 |

# Additional sub-district areas

FNDC requested the provision of estimates and projections for additional sub-district areas which don't align with Stats NZ's SA2 boundaries. These include the Kerikeri-Waipapa structure plan area and urban area, small settlements, and the service areas for FNDC's eight water and 16 wastewater schemes. We have developed methods to estimate and project the population of these areas as best as possible, but it should be noted that these estimates and projections are not as robust as the SA2 and district level projections.

Water and wastewater service areas were estimated by comparing their area of benefit (as defined by FNDC) to Stats NZ's Statistical Area 1 (SA1) areas, and where the majority of dwellings in an SA1 were within the area of benefit, then the entire SA1 was counted as being in the service area. Population, households and dwellings were then estimated based on the SA1s share of the broader SA2 area, considering historic trends from the 2006, 2013 and 2018 Census, and the capacity for further growth in terms of known developments and zoned land.

Settlements were identified based on the settlement zones of the draft District Plan. The population of each settlement was quantified by analysing the distribution of address points (from Land Information New Zealand) within each Stats NZ meshblock area, and each meshblock's share of the overarching SA2 population. Settlements are generally much smaller than Stats NZ's geographic areas, so this approach represents a best effort attempt at identifying their size. This approach provides a reasonable estimate of population, dwellings and households in 2021, as it is based on 2022 address points and 2018 Census data. However, these estimates become more speculative moving further into the future and should be used with caution.

## Wastewater service areas

Population, household and dwelling projections for FNDC operated wastewater schemes are detailed in Table 9. These largely reflect the subdistrict growth described in previous sections, although they differ slightly as the scheme areas of benefit do not completely align with SA2 boundaries.

## Table 9

### Population projections by wastewater service area

Infometrics medium projection

| Wastewater scheme | Estimate 2021 | Projected annual change 2021-2034 | 2034-2053 | 2053-2073 |
|---|---|---|---|---|
| Ahipara | 1,417 | 13 | 1 | -1 |
| Hihi | 206 | 1 | 0 | -1 |
| Kaeo | 581 | 6 | 1 | -4 |
| Kaikohe | 5,666 | 34 | 15 | -13 |
| Kaitaia | 6,926 | 63 | 39 | 12 |
| Kawakawa | 1,589 | 3 | -2 | -4 |
| Kerikeri | 3,557 | 67 | 46 | 37 |
| Kohukohu | 189 | 0 | -1 | -2 |
| Opononi | 584 | 2 | -1 | -2 |
| Paihia | 4,217 | 60 | 11 | 5 |
| Rangiputa | 58 | 0 | 0 | 0 |
| Rawene | 546 | 0 | -1 | -2 |
| Russell | 802 | 6 | -1 | -2 |
| Taipa | 2,586 | 40 | 10 | 6 |
| Whangaroa | 158 | 1 | 0 | 0 |
| Whatuwhiwhi | 808 | 5 | 2 | 0 |

### Household projections by wastewater service area

Infometrics medium projection

| Wastewater scheme | Estimate 2021 | Projected annual change 2021-2034 | 2034-2053 | 2053-2073 |
|---|---|---|---|---|
| Ahipara | 536 | 6 | 0 | 0 |
| Hihi | 85 | 1 | 0 | -1 |
| Kaeo | 217 | 3 | 0 | -1 |
| Kaikohe | 1,832 | 22 | 5 | 1 |
| Kaitaia | 2,331 | 32 | 14 | 9 |
| Kawakawa | 525 | 4 | 1 | 0 |
| Kerikeri | 1,449 | 21 | 13 | 13 |
| Kohukohu | 77 | 0 | 0 | -1 |
| Opononi | 239 | 1 | -1 | -1 |
| Paihia | 1,794 | 17 | 3 | -1 |
| Rangiputa | 24 | 0 | 0 | 0 |
| Rawene | 210 | 1 | -1 | 0 |
| Russell | 383 | 1 | -1 | -1 |
| Taipa | 1,109 | 11 | -1 | 1 |
| Whangaroa | 63 | 0 | 0 | 0 |
| Whatuwhiwhi | 339 | 2 | 0 | 0 |

**Dwelling projections by wastewater service area**

Infometrics medium projection

| Wastewater scheme | Estimate 2021 | Projected annual change 2021-2034 | 2034-2053 | 2053-2073 |
|---|---|---|---|---|
| Ahipara | 633 | 6 | 0 | 0 |
| Hihi | 215 | 1 | 0 | -1 |
| Kaeo | 225 | 3 | 0 | -1 |
| Kaikohe | 1,716 | 22 | 5 | 1 |
| Kaitaia | 2,340 | 32 | 14 | 9 |
| Kawakawa | 538 | 4 | 1 | 0 |
| Kerikeri | 1,433 | 21 | 13 | 13 |
| Kohukohu | 116 | 0 | 0 | -1 |
| Opononi | 397 | 1 | -1 | -1 |
| Paihia | 2,040 | 17 | 3 | -1 |
| Rangiputa | 112 | 0 | 0 | 0 |
| Rawene | 271 | 1 | -1 | 0 |
| Russell | 641 | 1 | -1 | -1 |
| Taipa | 1,581 | 11 | -1 | 1 |
| Whangaroa | 101 | 0 | 0 | 0 |
| Whatuwhiwhi | 679 | 2 | 0 | 0 |

## Water supply service areas

Population, household and dwelling projections for FNDC operated water supply schemes are detailed in Table 10. These largely reflect the subdistrict growth described in previous sections, although they differ slightly as the scheme areas of benefit do not align with SA2 boundaries.

### Table 10

**Population projections by water supply service area**

Infometrics medium projection

| Water supply scheme | Estimate 2021 | Projected annual change 2021-2034 | 2034-2053 | 2053-2073 |
|---|---|---|---|---|
| Kaikohe | 5,826 | 34 | 15 | -14 |
| Kaitaia | 6,782 | 59 | 37 | 10 |
| Kawakawa | 3,438 | 11 | -5 | -8 |
| Kerikeri | 5,372 | 89 | 50 | 36 |
| Okaihau | 792 | 5 | -1 | -3 |
| Opononi | 588 | 3 | -1 | -2 |
| Paihia | 4,217 | 60 | 11 | 5 |
| Rawene | 614 | 0 | -1 | -2 |

**Household projections by water supply service area**

Infometrics medium projection

| Water supply scheme | Estimate 2021 | Projected annual change 2021-2034 | 2034-2053 | 2053-2073 |
|---|---|---|---|---|
| Kaikohe | 1,892 | 22 | 5 | 1 |
| Kaitaia | 2,280 | 31 | 14 | 8 |
| Kawakawa | 1,110 | 12 | 1 | 0 |
| Kerikeri | 2,193 | 30 | 11 | 12 |
| Okaihau | 291 | 3 | 0 | -1 |
| Opononi | 241 | 1 | -1 | -1 |
| Paihia | 1,794 | 17 | 3 | -1 |
| Rawene | 236 | 1 | -1 | -1 |

**Dwelling projections by water supply service area**

Infometrics medium projection

| Water supply scheme | Estimate 2021 | Projected annual change 2021-2034 | 2034-2053 | 2053-2073 |
|---|---|---|---|---|
| Kaikohe | 1,778 | 22 | 5 | 1 |
| Kaitaia | 2,299 | 31 | 14 | 8 |
| Kawakawa | 1,059 | 12 | 1 | 0 |
| Kerikeri | 1,930 | 30 | 11 | 12 |
| Okaihau | 299 | 3 | 0 | -1 |
| Opononi | 399 | 1 | -1 | -1 |
| Paihia | 2,040 | 17 | 3 | -1 |
| Rawene | 272 | 1 | -1 | -1 |

## Settlements

Population, household and dwelling estimates for Far North settlements are detailed in Table 11. For many of these settlements, the number of dwellings greatly outnumbers the number of households – this is due to unoccupied dwellings, typically holiday houses, which are counted as dwellings but not households as their occasional occupants reside elsewhere.

### Table 11

**Population, household and dwelling estimates by settlement**

Infometrics estimates for 2021

| Settlement | Population | Households | Dwellings |
|---|---|---|---|
| Horeke | 43 | 15 | 20 |
| Kaimaumau | 72 | 26 | 65 |
| Koutu | 76 | 29 | 52 |
| Manawaora | 52 | 21 | 46 |
| Matauri | 65 | 26 | 22 |
| Matauri Bay | 45 | 18 | 17 |
| Mitimiti | 23 | 8 | 13 |
| Ohaewai | 278 | 109 | 107 |
| Okiato | 220 | 104 | 147 |
| Te Wahapu | 155 | 63 | 104 |
| Opito Bay | 43 | 21 | 26 |
| Orongo Bay | 28 | 11 | 15 |
| Ota Point | 26 | 9 | 14 |
| Panguru | 504 | 198 | 284 |
| Pukenui | 171 | 69 | 77 |
| Rangitane | 28 | 11 | 156 |
| Taupo Bay | 72 | 29 | 51 |
| Tauranga Bay | 17 | 7 | 56 |
| Te Ngaire | 25 | 10 | 49 |
| Te Uenga Bay | 93 | 44 | 78 |
| Totara North | 100 | 40 | 54 |
| Waimamaku | 45 | 18 | 20 |
| Waipapakauri Beach | 119 | 43 | 55 |

# Peak population

This section includes analysis of peak population. The population projections contained in previous sections are on the basis of the permanent resident population, as estimated by Stats NZ as of the 30th of June each year. However, some parts of the Far North experience volatility in the number of people present in the district – for example, seasonal workers for the horticulture industry, or tourists. This section attempts to estimate how large the peak population may be in each area relative to the permanent resident population, and understand the timing of these peaks.

## Peak population approach

We used daily wastewater flows as a proxy for daily population in each of the Far North's settlements, in order to understand the magnitude and timing of population peaks throughout the year. We focused on wastewater flows as they are more closely related to population than water supply, which can be affected by seasonal trends such as filling of pools and watering gardens during hot periods.

Daily wastewater flow data and rainfall for each of the district's wastewater treatment plants was sourced from centralised records for the 2018 to 2021 period, and individual site logbooks back as far as 2013. There were widespread data quality issues which severely constrained the analysis and prevented analysis for some settlements. The data quality issues included missing data for multiple months at a time, and implausible values.

Wastewater data was processed by clipping the series to provide a continuous multi-year time series for each settlement. A mean daily value was determined for each settlement and this was used to overwrite any missing or implausible values. Rainfall data was used to identify days where wastewater inflows may have been affected by rainwater infiltration, such that wastewater flows were overwritten with the mean daily value when there had been greater than 0.5mm of rainfall in the preceding two days. Extreme values, defined as 3 times the mean daily flow, were also overwritten with the mean daily flow.

Despite extensive data processing, we were unable to analyse patterns in wastewater flows for Kerikeri, Rawene, Paihia, East Coast (Taipa) and Kawakawa due to poor quality data. Data quality issues also prevented a robust conclusion on the magnitude and timing of peak populations for most areas.

## Changing trends will alter the peak population

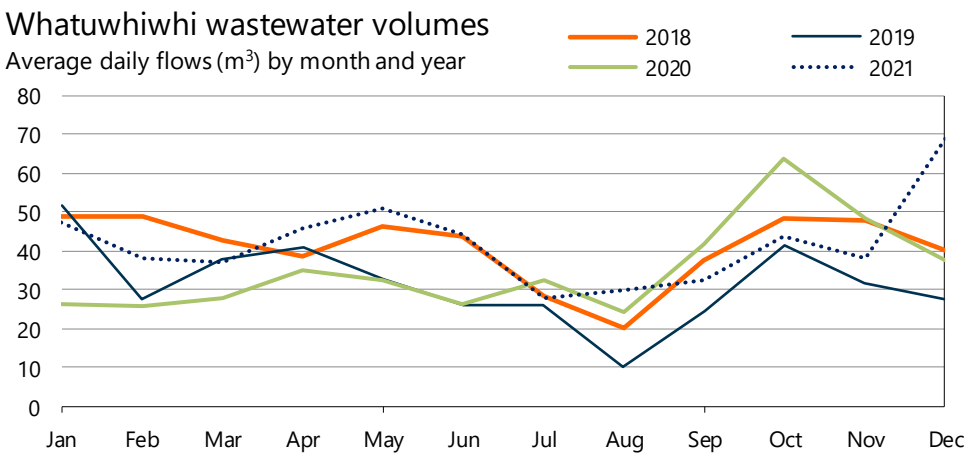
Changing trends around tourism and migrant workers in recent years will affect the trends. International visitor arrivals to New Zealand grew 173% between 2013 and 2019, which will affect the magnitude of population peaks in settlements driven by international tourists such as Paihia and Russell. Since the onset of COVID-19, many holiday destinations are experiencing higher occupancy of holiday houses and greater domestic tourism as border closures prevented New Zealanders from travelling for international holidays. Rapidly escalating house prices over the past decade may have

encouraged permanent occupation of dwellings formerly used as holiday houses, which will increase the permanent population and reduce the magnitude of population peaks.

# Whatuwhiwhi

Wastewater volumes in Whauwhiwhi (including Tokerau Beach) did not show any appreciable monthly pattern (Graph 17). Weekly data showed and approximately 30% increase in volumes associated with Labour Weekend and between Christmas and New Years Eve (NYE).

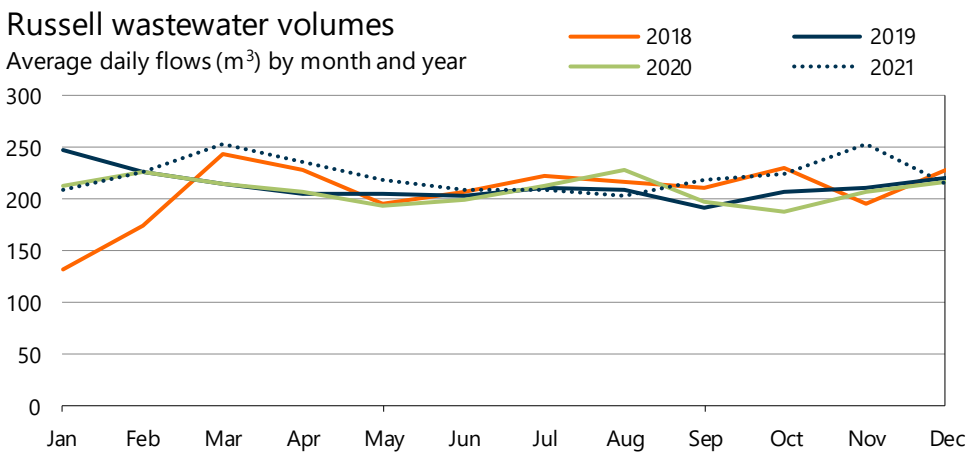
**Graph 17**




# Russell

Wastewater volumes in Russell did not exhibit any appreciable seasonal pattern (Graph 18).

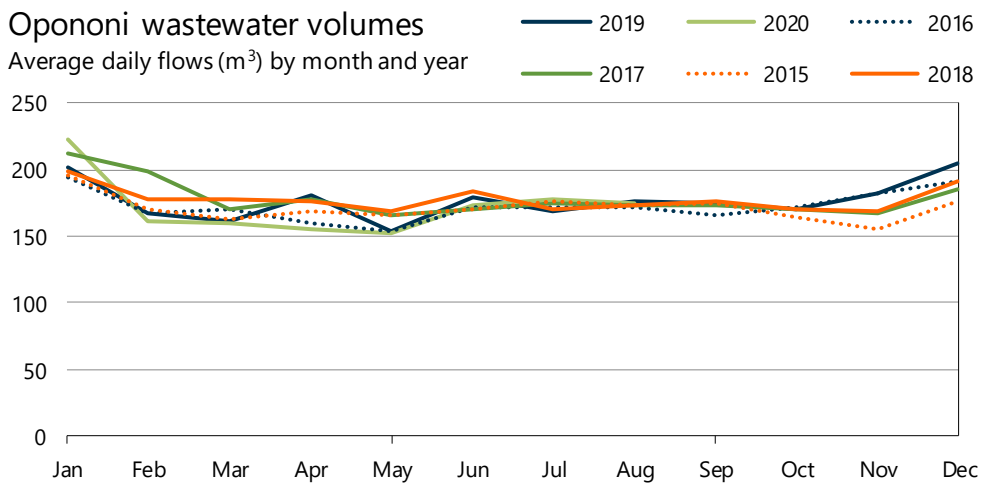
**Graph 18**



# Opononi

Wastewater volumes in Opononi exhibited notable peaks around summer (Graph 19), with December flows 7% higher than average, and January flows 17% higher than average. Flows in the first two weeks of January were typically 30% higher than average.

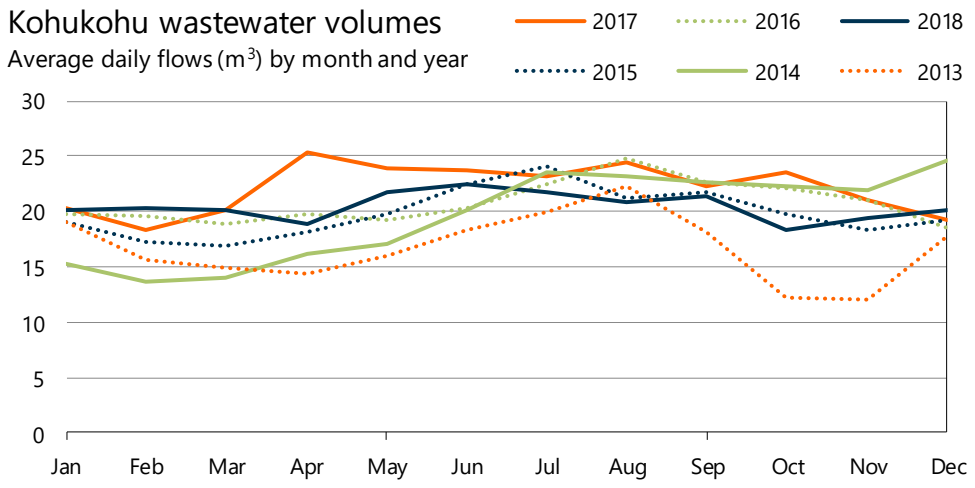
**Graph 19**




# Kohukohu

Wastewater volumes in Kohukohu did not exhibit any appreciable seasonal pattern (Graph 20).

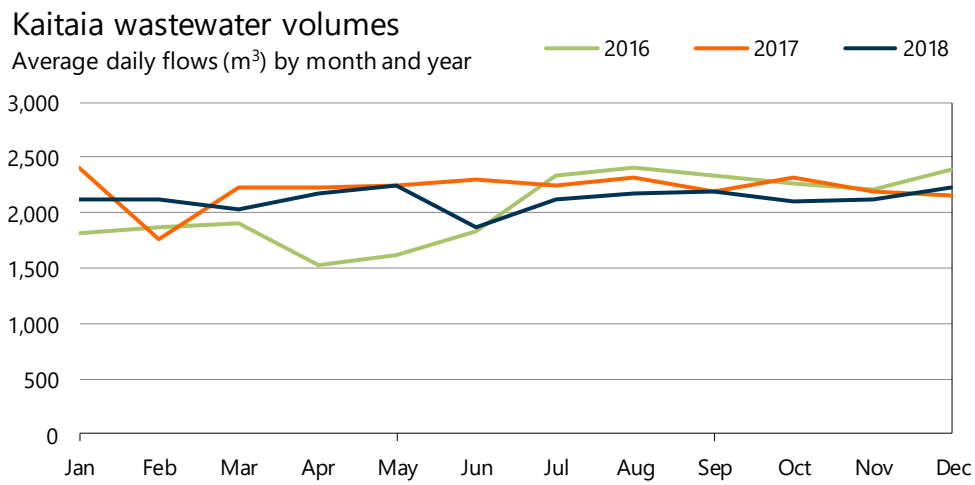
**Graph 20**




# Kaitaia

Wastewater water volumes in Kaitaia exhibit steady wastewater volumes with no seasonal pattern (Graph 21). The presence of large industrial wastewater producers may add stability to daily flows and disguise any seasonal population patterns.

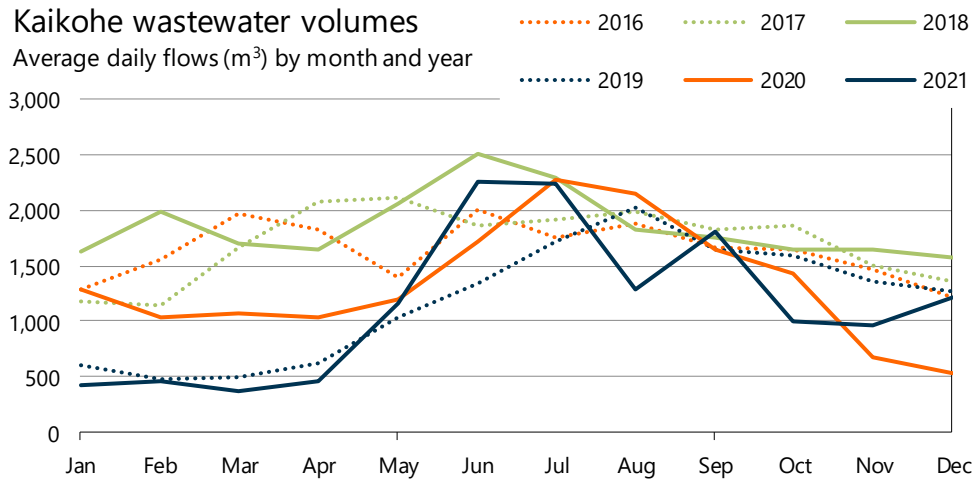
**Graph 21**




# Kaikohe

Wastewater volumes in Kaikohe exhibit higher volumes in winter, which could be indicative of groundwater infiltration rather than a winter population peak (Graph 22).

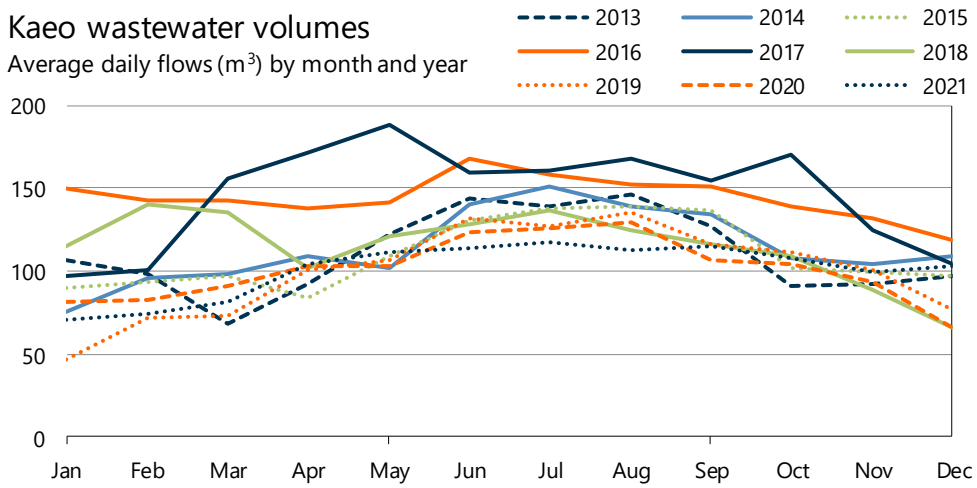
**Graph 22**




# Kaeo

Wastewater volumes in Kaeo exhibit higher flows during winter, which like Kaikohe could be indicative of groundwater infiltration rather than a winter population peak (Graph 23).

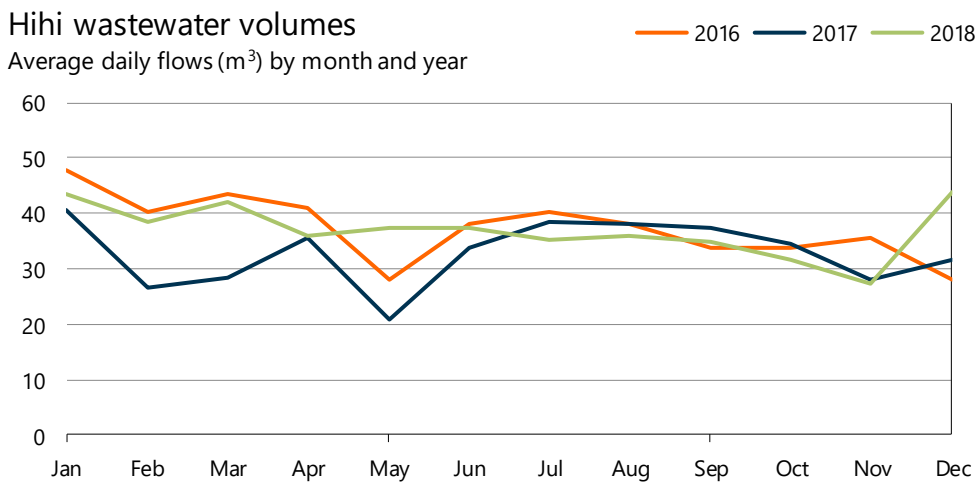
**Graph 23**




# Hihi

Hihi exhibits very stable wastewater volumes with limited seasonality (Graph 24).

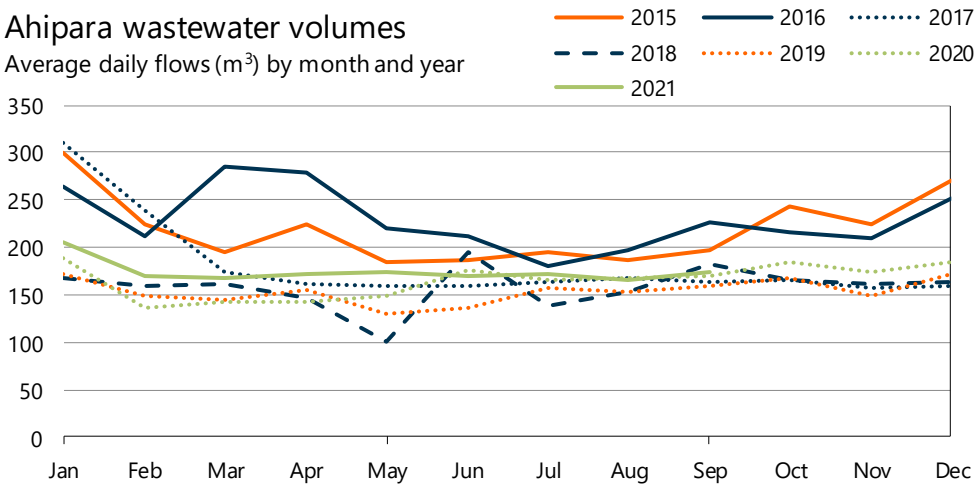
**Graph 24**




# Ahipara

Ahipara wastewater flows exhibit a steady pattern throughout the year (Graph 25). The 2015-17 years exhibited a noticeable peak in December and January, but this pattern is no longer evident. This may reflect holiday houses becoming increasingly permanently occupied since 2017.

**Graph 25**


Ahipara wastewater volumes
Average daily flows (m3) by month and year
2015
2016
2017
2018
2019
2020
2021
350
300
250
200
150
100
50
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

# Appendix – our approach in detail

This section expands on the brief methodology described in *Our approach*, explaining our approach to each facet of the projection, including key assumptions that we have made.

## Employment forecast

Infometrics forecasts regional employment through a combination of three models. Our macro-economic model provides forecasts of national employment on an annual basis up to 2026. Our general equilibrium model forecasts national employment by industry over the long-term. Finally, our regional forecasting model breaks these forecasts down to industries in each region.

### Macro-economic model

Infometrics maintains a macroeconomic forecasting model that underpins our five-year forecasts of activity across the national economy. Our model accounts for the relationships between different sectors of the economy and their responsiveness to one another. These include the labour market, households, businesses, government, the international trade sector, and financial markets.

In times of economic upheaval, we refine the output from the model based on expert input from our forecasting team, their knowledge of rapidly changing trends in the economy, and the insights we gain from our interactions with central government, Councils, Economic Development Agencies, and private sector clients.

Overseeing the forecasting process and model is Gareth Kiernan, who has been forecasting the New Zealand economy for more than 20 years. The framework provides quarterly forecasts of GDP, employment, unemployment, and a range of other macroeconomic indicators up to 2026.

### General equilibrium

Infometrics general equilibrium (GE) model enables us to produce long term national forecasts of employment by 55 industries. To obtain projections for a 30-year horizon requires an approach that is based on structural issues such as technological change, industry productivity, demographics, evolving demand for different consumer goods and services, and New Zealand's international competitiveness. The model presents a picture or scenario of the economy for the target years (in our case 2030 and 2050) based on plausible assumptions of economic factors including international commodity prices, population growth, carbon price, automation, changes in energy efficiency, and substitution between four energy types (coal, oil, gas and electricity). Some of the key macro-economic assumptions used by the model are shown in Table 12.

Long term forecasts should ideally be presented as scenarios given the uncertainty of the future. In this project we will present a central scenario which is based on a central view of a range of factors than can influence employment outcomes over the long term.

Infometrics' GE model is maintained by one of New Zealand's foremost econometricians, Dr Adolf Stroombergen.

Table 12. ESSAM macro-economic assumptions and outputs

| Indicator | 2025-2030 | 2030-2050 |
|---|---|---|
| *Growth rates* | | |
| Population | 1.0%pa | 1.0% pa |
| Labour force | 0.7%pa | 0.46%pa |
| GDP | 2.9%pa | 1.7%pa* |
| World trade | 2.7%pa | 2.5%pa |
| Public investment | 3.0%pa | 2.5%pa |
| Government consumption | 2.1%pa | 1.7%pa |
| Investment in dwellings | 2.0%pa | 1.0%pa |
| *Real prices* | | |
| Oil price | US$110/bbl in 2030 | US$110/bbl in 2050 |
| Carbon price | NZ$100/tonne $CO_2$ in 2030 | NZ$200/tonne $CO_2$ in 2050 |

* These are model results, not input assumptions.

## Regional Forecasting Model

The Regional Forecasting Model is an econometric model which breaks national employment forecasts to detailed industry and regional level. It draws on Infometrics 20-year quarterly time series of employment by detailed industry by territorial authority. The model uses a mix of top-down and bottom-up approaches. It simultaneously provides forecasts for all industries in all territorial authorities that are constrained to be consistent with Infometrics macroeconomic forecasts for the national economy in the medium term and the outputs of the GE model in the long term.

A number of sub-models which use a bottom-up approach feed into the Regional Forecasting Model. We build sub-models for industries that we have detailed insights into, and we forecast drivers of employment in those industries. Currently we use four industry sub-models.

*Construction sub-model*

The construction sub-model provides forecasts of employment in each of the 24 construction sub-industries in each territorial authority. It is an econometric model which is largely driven by Infometrics forecasts of work put in place (WPIP) which are presented to clients via our Regional Construction Outlook product. Our WPIP forecasts are driven by population growth, household formation, and large construction projects which have been signalled. Employment is assumed to respond in a lagged manner to changes in WPIP. The length and magnitude of those lagged responses differs across industries.

*Education sub-model*

The education sub-model provides forecasts of employment for the following subindustries: early childhood education, primary education, secondary education, tertiary and vocational education. The model develops a relationship between age

cohorts and demand for services from each sub-industry and draws on our age specific population forecasts to estimate the demand for services from each sub-industry. For example, the size of the population of 0- to 4-year-olds drives the demand for early childhood education. In some cases, we assume that student to staff ratios will keep falling and these have also been incorporated into our estimates for long-term demand. We then estimate the speed at which employment will converge to long-term demand. The model accounts for trends in international education which are driven by different factors compared to domestic education.

*Healthcare sub-model*

The healthcare sub-model disaggregates into healthcare industries (hospitals, dental services, etc) and social service industries (aged care, childcare). We use regional population projections to estimate long-term demand for these services. Where relevant we combine these regional population projections with estimates of demand for healthcare services by age group. For example, demand for hospital workers incorporates data on the number of hospital bed days by age group.

*Retail and hospitality sub-model*

The retail and hospitality sub-model disaggregates into retail industries and hospitality industries (accommodation and food services). Forecasting is a two-stage process. First, we forecast regional retail and hospitality sales, taking into account the different components of sales: local spending, domestic tourism and international tourism. This allows us to account for the regional variations in the impact of COVID, which include lower international tourism but higher amounts of local spending and domestic tourism. Second, we use econometric models to forecast the impact of retail and hospitality sales on employment.

*Other industries*

For industries with no sub-model the RFM draws on historic trends, patterns and relationships, and projects these into the future. RFM draws on a 20-year quarterly time series of employment by 500 industries in each territorial authority. It creates multiple forecast models for every territorial authority and industry combination and using machine learning techniques, selects and applies the model which has proven to have best predictive ability. Using these techniques, it produces forecasts of employment across 500 industries for each territorial authority over the long term.

# Population projection

## Scenarios

We will produce projections across three scenarios – low, medium and high. These are distinguished by different projections of net migration, births and deaths.

## Population base

As a rule, the appropriate population to use for Council Long Term Planning (LTP) purposes is the estimated resident population (ERP). This represents all individuals who permanently reside in an area and could be considered a 'maximum' population, as a percentage of these individual is likely to be away at any given point in time.

Consequently, the StatsNZ 2021 Estimated Resident Population (ERP) is considered as the basis for the population projections. This estimate is produced by StatsNZ with the most recent available Census (2018) data, and births, deaths and migration that has been recorded since.

Given that the majority of population projection parameters from StatsNZ are published for five-year intervals, our projection model also operates at five-year intervals, from 2018 to 2073. We then make use of a cubic-spine statistical process to interpolate population to single years. We make adjustments to reflect that with data up to 2021 currently available, we have data for three out of five years in the 2018 to 2023 period. We repeat this process every year to account for Stats NZ's annual publication and revision of subnational population estimates.

## Fertility

StatsNZ projects regional age-specific fertility rates, for five-year age groups, which we apply to our estimates of population by age and gender cohorts, in order to estimate the number of births in each five-year period. Throughout the projection period, we adopt StatsNZ's assumed gender ratio of 105.5 males per 100 females born – this is based on the historic average ratio at a national level. This phenomenon is commonly observed around the world, and is understood to be a function of slightly higher miscarriage rates for female babies, rather than of selective abortion.

## Mortality

Projected age- and gender-specific mortality rates by region or territorial authority, as calculated by StatsNZ, are applied to accurately project the number of deaths. These rates vary over time to reflect observed trends such as extended life expectancy.

## Migration

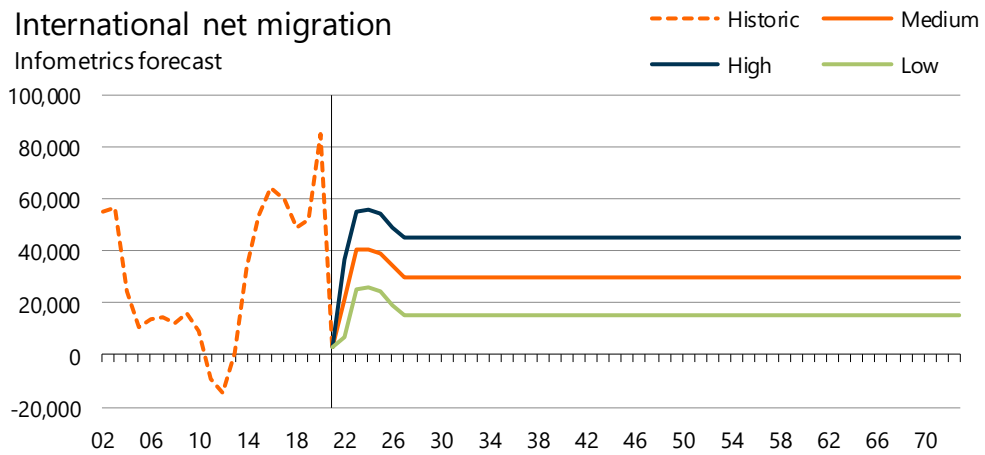
We build up our projection of net migration in two stages. First, we consider overall volumes of international net migration to New Zealand. This contributes to the total pool of net migrants – international and internal – which we apportion to each territorial authority.

## International net migration volumes

The population projections draw on Infometrics' short- and long-term international migration forecasts. These are illustrated in Graph 26.

In the short term, COVID-19-related border restrictions are the most significant influence on international net migration. We expect that international net migration will recover strongly through 2022 as New Zealand's international borders are progressively reopened, and the 2021 Resident Visa reduces outflows of migrant workers. Net migration is forecast to peak at 45,000 in 2023, before settling at our long-term forecast level of 30,000 per annum from 2027 onwards. This reflects that our forecast of steady employment growth projected and an ageing population, we expect sustained positive net migration over the long term, particularly with the aid of favourable work visa conditions.

**Graph 26**




## Regional distribution of migration

Migration is apportioned to territorial authorities using a mix of two approaches. Firstly, historic migration trends are applied to forecast the volume of non-employment-driven migration, such as people moving at retirement. Secondly, forecast labour market shortfalls are used to forecast the volume of employment-driven migration, such as people moving to take up employment opportunities. Employment-driven migration is also adjusted somewhat to account for commuting patterns between districts.

For non-employment-driven migration, we apply the age and gender profile of Stats NZ's subnational net migration projections. For employment-driven migration, we apply a bespoke age and gender profile, based on Stats NZ's projection with adjustment made around older age groups and groups with net negative migration. Analysis of net migration by age reveals that migration flows of persons aged 80 years and older are relatively unresponsive to economic conditions, as this group is generally not involved in the labour market and migration is driven by non-economic factors such as moving closer to family or healthcare. Therefore, we only model employment-driven migration in age groups up the age of 79 years. We do model migration of children (0-14 years of age) as being responsive to the employment market as this is evident in historic data, which reflects families moving in pursuit of employment opportunities for the parents. For areas which receive additional employment-driven migration, we assume that this is concentrated in age-gender groups with positive migration flows, as we expect a strong labour market would accentuate positive regional labour flows and not extend negative flows.

## Labour Market Shortfalls

Labour market shortfalls exist when employers' requirement for labour exceeds the number of workers available at current wage rates. When labour market shortfalls exist in an area, additional labour, and hence population, is attracted to that area.

Infometrics estimates future labour market shortfalls by separately considering the projected supply of labour and the projected demand for labour (as measured by employment) and comparing these two factors.

As the starting point for estimating labour supply, Infometrics makes use of StatsNZ's published population projections by 5-year age group and gender.

Labour force participation rates (LFPRs) by age and gender are projected based on StatsNZ's national labour force projections. In addition, historic LFPRs for each region are analysed to identify their deviation from the national average. This deviation is applied to the national LFPR by age, to project regional LFPR by age. Historic averages for the unemployment rate in each region are analysed and projected forward. Projected LFPR by age is applied to the StatsNZ population projection, and the projected unemployment rate is applied to this, in order to estimate labour supply.

This projection is undertaken for each region or territorial authority, enabling the balance between labour supply and demand (as measured by employment) to be assessed within each labour market area. In periods of insufficient labour supply within a territorial authority or broader regional labour market to meet projected labour demand, the area is projected to receive additional migration.

This additional migration is apportioned to regions or territorial authorities based on their respective share of the national labour market shortfall. At the same time, however, additional migration may be constrained by the Infometrics' international net migration forecast, meaning that a particular region may not necessarily receive sufficient inward migration to entirely eliminate its labour market shortfall.

Similarly, the projected LFPR and unemployment rates are applied to the additional migration, reflecting the fact that it is rarely possible to import only workers – instead these workers often come with family members, who may not necessarily be economically active. Examples in this regard might include stay-at-home parents, children and aged dependents. Furthermore, in some instances, migrants may not immediately gain employment following their move.

## Sub-district population

We project sub-district population by considering the current population in each SA2 area, historic trends in each SA2, overall growth of the district, and the development capacity in each SA2 area. This process is carried out through a full cohort-component model for each SA2 area. SA2 areas vary widely in geographic size, but are defined by StatsNZ to have similar populations – 1,000 to 3,000 residents. In Far North District, many SA2 are at the lower-end of this range as they cover vast areas of low population density.

### Development capacity

We quantify the projected development capacity of each SA2 area distribution within a region or territorial authority by considering historic settlement patterns and expectations of future residential development activity. This process will include a workshop with council planning and infrastructure staff, gathering predominantly qualitative information and turning this into a quantitative estimate of development capacity and likely uptake for each SA2.

### Infrastructure service areas

We will also produce projections for infrastructure service areas, which are in some cases below the resolution of SA2. We will build these up from a combination of SA1 areas which typically consist of 100 to 200 residents. These areas are too small for a full cohort component process, so we will estimate them based on their share of their overarching SA2 area.

### Māori ethnicity

We project the population identifying with Māori ethnicity using 2018 Census data and Stats NZ's 2018-base subnational ethnic population projection.

We create the starting point for the Māori projection by taking 2018 Census usually resident population that identifies as Māori in each SA2. We then scale this up to align with the estimated resident population, which is population base used elsewhere in this report. We project the Māori population by applying the Māori population share of each age-sex group from Stats NZ's subnational ethnic population projections to the projected age-sex structure of each SA2.

## Household projection

The number of households at SA2 or district level is projected by applying household formation, or Living Arrangement Type Rates (LATR) to the projected population. Stats NZ projects LATR to 2043 from the 2018 Census figures for each territorial authority. These rates reflect localised differences based on local population composition, for example, some non-European ethnic groups exhibit a greater propensity to form multi-generational households, leading to larger household sizes. These projected rates also consider trends such as delayed childbearing, growing numbers of childless couples, decreased rates of single parenting, and improvements in life expectancy which enable older individuals to live independently for longer periods. This means that the LATR used in the projections transitions up to 2043, and then remain constant at 2043 rates up to 2073.

Applying LATR to the population provides an estimate of the number of people in each living arrangement type; this is then translated into the number of households based on expected family structures – for example, couple households consisting of two individuals. For other multi-person households, we follow the standard StatsNZ assumptions, and assume 2.6 persons per household. Projected population figures are accordingly divided by the number of households to project average household size.

The projected household size calculated in these projections varies somewhat from the 2018 Census measures. This is because Census counts are randomly rounded to the nearest multiple of 3, or supressed entirely, so as to ensure confidentiality of Census respondents. Census outputs such as average household size are however based on actual data, meaning that it is impossible for third parties to precisely replicate these outputs. Projection outputs can also vary from Census measures due to short-term changes such as increased housing occupancy in response to increasing housing costs.

## Dwelling projection

We will develop a time-series of dwellings by SA2 by incorporating historic census and building consent data, and projected household growth. We will estimate the historic number of dwellings in each SA2 area by considering the change in dwellings between the 2006, 2013 and 2018 Census, and the number of new dwelling consents issued in the intervening period, allowing for a lag between building consent issuance and dwelling completion. For future periods, we will use the projected change in households to indicate the change in dwellings. This includes the implicit assumption that the number of unoccupied dwellings (such as holiday houses) hold at a steady level into the future.

Classification of unoccupied dwellings has varied across the past two Censuses, which makes it difficult to robustly test this assumption.