

Growth Model 2017

Summary of Outputs, Assumptions, and Methods

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Executive Summary

Tasman District's population is projected to grow from 48,800 in 2013 to 57,260 in 2048. Council's long-term planning aims to determine how best to provide for this projected population growth and the associated growth in Tasman's housing and business activity.

The growth model is a District-wide, long term development planning tool. It underpins Council's long term planning through the Activity Management Plans, Long Term Plan, Infrastructure Strategy and other supporting policies (e.g. Development Contributions Policy).

The purpose of the growth model is to provide predictive information (demand and supply) for future physical development, to inform the programming of a range of services, such as network infrastructure and facilities, and district plan reviews. The model generates projections for new residential dwellings and new business lots for 17 settlement areas and 5 ward remainder areas. The 17 settlements are discrete geographic areas where some of the District's population is concentrated. The number of residents in each settlement ranges from the largest centres of Richmond and Motueka, to smaller settlements such as St Arnaud, Marahau and Upper Moutere. The five ward remainder areas are the rural areas outside of the 17 settlements.

The key demographic assumptions affecting future growth are:

- ongoing population growth over the next 30 years with the rate of growth slowing over time
- higher growth in Richmond, Motueka, Mapua, Brightwater, and Wakefield for ten years - 2018-2028
- an ageing population, with population increases in residents aged 65 years and over
- a decline in average household size, mainly due to the ageing population with an increasing number of people at older ages who are more likely to live in one or two person households.

After considering recent estimated population and dwelling growth rates, Council has used Statistics New Zealand's high growth projections for Richmond, Brightwater, Wakefield, Motueka, and Mapua/Ruby Bay and medium growth projections for the rest of the District, for 2018-2028. Medium growth projections have been used for the whole District for 2028-2048¹.

Residential growth is measured in the number of new dwellings. Council has estimated demand for 2,955 new dwellings over the next ten years, and a further 3,040 dwellings between 2028 and 2048. This is based on population and household size projections. It also allows for demand for dwellings for non-residents, such as holiday houses or temporary worker accommodation. The growth model projects demand for new dwellings to be an average of 365 per year for Years 1-3 (2018-2021), dropping to 266 per year for 2021-2028. In recent years, Tasman has experienced increased growth in the number of new dwellings, with an average annual increase in the last three years of 365 new dwellings. The average over the last ten years was 291 new dwellings per year.

Business growth is measured in the number of new business lots. Council has estimated demand for 243 new business lots in our 17 settlements over the next ten years, and a

¹ All projections used are Statistics NZ Subnational Population Projections 2013(base)-2043 update (released 22 February 2017)

further 212 new lots between 2028 and 2048. This is based on a business land forecasting model from consultants, Property Economics, using medium population projections, national and regional economic trends, employment projections and employment to land ratios.

In most settlements throughout the District, Council has planned to supply enough zoned and serviced land to at least meet the forecast demand for dwellings and business lots. Supply (rollout) estimates are based on an assessment of each area's feasible developable capacity and knowledge of forthcoming development proposals and landowner intentions.

The model is based on the best information has at the time and is not intended to be an exact forecast of when and where development will actually occur. There are several factors which are difficult to predict such as population migration to, from and within the district; the proportion of dwellings used as holiday houses; developer and landowner activity; and natural events. Population projections will be updated following the 2018 Census to reflect any significant population changes.

Growth Model Outputs

The growth model outputs provide demand and supply projections for 22 discrete areas in the District (17 settlement areas and 5 ward remainder areas) for five time periods:

- Year '0' (2016/17-2017/18, note it actually covers the two years before Year 1)
- Years 1-3 (2018/19 - 2020/21)
- Years 4-10 (2021/22 – 2027/28)
- Years 11-20 (2028/29 – 2037/38)
- Years 21-30 (2038/39-2047/48).

The commentary below focuses on Years 1 onwards (i.e. excludes Year 0), unless otherwise stated.

Residential

Residential growth is measured in the number of new dwellings. Council has estimated demand for 2,955 new dwellings over the next ten years, and a further 3,040 dwellings between 2028 and 2048. This is based on population and household size projections, and also allows for demand for dwellings for non-residents, such as holiday houses or temporary worker accommodation. As with population growth, the growth rate for new dwellings is expected to decrease over time.

As shown in Table 1, Council has planned to supply enough land to at least meet the demand (as forecast by the model) in most settlements throughout the District. Supply (rollout) estimates are based on an assessment of each area's feasible developable capacity and knowledge of forthcoming development proposals and landowner intentions.

Council needs to ensure sufficient land and services are available to accommodate the projected housing and population growth. The growth in the District in recent years was higher than expected and used up considerable amounts of available infrastructure capacity. The combination of this and the ongoing projected population and housing growth, beyond the ten years of our Long Term Plan 2018-2028, creates demand for additional capacity in Council's infrastructure, particularly in those areas with forecast higher growth (Richmond, Motueka, Brightwater, Mapua and Wakefield).

Council is anticipating increased demand in our larger settlements as the rural population ages and people choose to live closer to services.

The National Policy Statement on Urban Development Capacity (NPS-UDC) also requires Council to provide an additional margin of feasible development capacity in Richmond which is 20% above the projected demand for the next ten years, and 15% above the demand projected for 2028-2048. Council also anticipates some of Richmond's capacity will meet demand from Nelson's population growth. The NPS-UDC requires Council to work together with Nelson City Council in providing sufficient development capacity for the Nelson-Richmond main urban area. Recent trends in building consents have shown stronger growth in Richmond than in Nelson and it is anticipated that this demand will continue.

The supply of new dwellings in the Coastal Tasman area is also expected to be significantly higher than the projected demand. This is due to several large greenfield subdivisions which are already under development, in an area which has historically not experienced population growth. This oversupply is expected to be enabled without the need for large Council-funded infrastructure projects.

Table 1: Summary of Residential Demand and Rollout Projections

Area	Dwellings			
	Demand	Rollout	Demand	Rollout
	Years 1-10		Years 11-30	
Brightwater	166	176	220	221
Coastal Tasman Area	134	300	180	130
Collingwood	10	10	2	4
Kaiteriteri	30	37	26	57
Mapua/Ruby Bay	184	217	241	274
Marahau	7	58	5	32
Motueka	514	519	437	441
Murchison	13	15	-14	4
Pohara/Ligar/Tata Bay	37	64	7	27
Richmond	909 (1091 with NPS 20% margin)	1522	826 (950 with NPS 15% margin)	941
Riwaka	20	0	30	0
St Arnaud	46	46	61	34
Takaka	39	39	-2	28
Tapawera	8	8	8	8
Tasman	9	9	12	7
Upper Moutere	8	8	10	10
Wakefield	153	195	175	207
Ward Remainder Golden Bay	109	109	21	44
Ward Remainder Lakes Murchison	134	50	189	100
Ward Remainder Motueka	136	136	188	188
Ward Remainder Moutere Waimea	213	213	276	276
Ward Remainder Richmond	76	76	142	142
Total District	2955	3807	3040	3175

Council has not planned to meet demand in the Riwaka settlement area as this land is flood prone. This does not prevent new houses from being built in this area but it does signal that Council's preference is for this demand to be taken up elsewhere in the Motueka Ward area.

Council has planned for rollout to exceed demand in areas with Special Housing Areas, which are located in Richmond West, Wakefield, Marahau and Pohara.

Business

Business growth is measured in the number of new business lots. Council has estimated demand for 243 new business lots in our 17 settlements over the next ten years, and a further 212 new lots between 2028 and 2048. This is based on a business land forecasting model from consultants, Property Economics, which incorporates population projections, national and regional economic trends, employment projections and employment to land ratios. As with population growth, the growth rate for new business lots is expected to decrease over time.

Council has planned for supply to at least meet demand in most settlements throughout the District. Supply (rollout) estimates are based on an assessment of each area's feasible developable capacity and knowledge of forthcoming development proposals and landowner intentions. In Richmond, Council has planned for significantly more supply than the projected demand. This is based on the requirement from the National Policy Statement on Urban Development Capacity (NPS-UDC) for Council to provide an additional margin of feasible development capacity which is 20% above the projected demand for the next ten years, and 15% above the demand projected for 2028-2048. Council has planned for all that additional capacity to be enabled in Years 1-10.

Table 2: Summary of Business Demand and Rollout Projections

Area	Business Lots			
	Demand	Rollout	Demand	Rollout
	Years 1-10		Years 11-30	
Brightwater	2	6	3	6
Collingwood	2	2	2	0
Kaiteriteri	1	2	0	0
Mapua/Ruby Bay	19	18	16	16
Marahau	0	0	0	0
Motueka	44	19	39	56
Murchison	7	7	4	3
Pohara/Ligar/Tata Bay	9	6	8	4
Richmond	125	176	109	109
Riwaka	4	2	3	1
St Arnaud	3	3	2	0
Takaka	19	6	18	5
Tapawera	1	5	3	2
Upper Moutere	0	2	0	0
Wakefield	7	11	5	6
	243	265	212	208

For Motueka and Takaka, Council has planned for fewer new businesses than the projected demand. However, there will be sufficient zoned and serviced business capacity in these town centres if needed. In the seven years from 2010 to 2016, Motueka and Takaka each had building consents issued for four new commercial buildings. Over the same timeframe, consents were issued for 17 new industrial buildings in Motueka and for three new industrial buildings in Takaka.

Assumptions

The key demographic assumption for the Tasman District, which drives both demand and rollout projections, is that the District, and all the settlements, will continue to experience population and household growth over the next ten years. Beyond that, the District's total population and household numbers will continue to grow at a slower rate, and some parts of the District (Golden Bay and Murchison) are projected to stop growing. The total District population is projected to plateau after 2038, at around 57,300. However, dwelling demand is projected to grow at a higher rate, and for longer, than population growth due to the decline in average household size.

Residential

Key demand assumptions

The key demographic assumptions affecting future residential demand are:

- ongoing population growth over the next 30 years with the rate of growth slowing over time
- higher growth in Richmond, Motueka, Mapua, Brightwater, and Wakefield for 2018-2028
- an ageing population, with population increases in residents aged 65 years and over
- a decline in average household size, mainly due to the ageing population with an increasing number of people at older ages who are more likely to live in one or two person households.

Population growth

Council has undertaken a detailed assessment of the likely population increase for all of the District's main settlements as well as rural areas outside of these settlements. The overall population of Tasman is expected to increase by 4,420 residents between 2018 and 2028, to reach 55,690. Most of the overall population growth will be driven by net migration gains (more people moving to Tasman District than leaving). The District will experience ongoing population growth over the next 30 years but the rate of growth will slow over time.

After considering recent estimated population and dwelling growth rates, Council has used Statistics New Zealand's high growth projections for Richmond, Brightwater, Wakefield, Motueka, and Mapua/Ruby Bay and medium growth projections for the rest of the District, for 2018-2028. Medium growth projections have been used for the whole District for 2028-2048.

The following graph shows the population growth Council is planning for, compared with the low, medium and high growth population projections for the whole District, published by Statistics New Zealand. Statistics New Zealand provides three population projections (low, medium, and high growth) that incorporate different fertility, mortality, and migration assumptions for each geographic area, and illustrate a range of possible scenarios.

The use of high growth projections for Richmond, Brightwater, Wakefield, Motueka, and Mapua/Ruby Bay, which make up 55% of the District's population, and medium growth projections for the rest of the District for the ten years between 2018 and 2028, results in Council's projections being about halfway between Statistics New Zealand's medium and high projections series for those years.

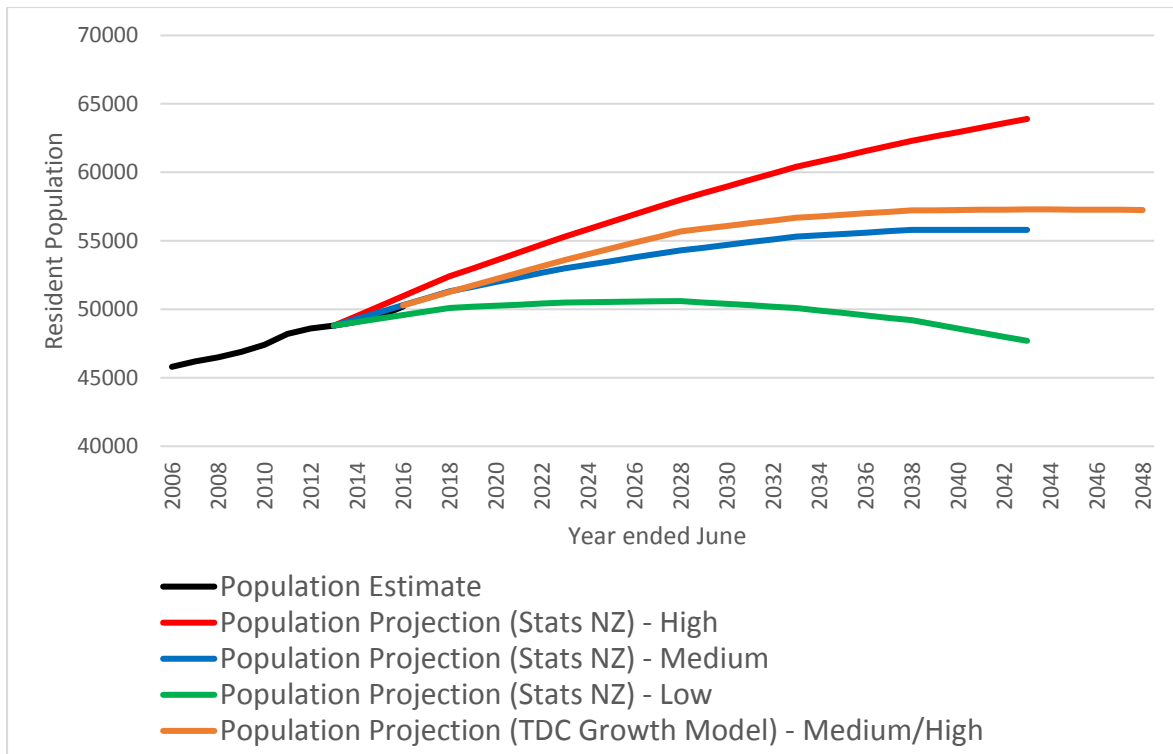


Figure 1: Estimated and projected population series, 2006-2048, Tasman District

The ageing population is driving a change in the average household size, projected to decrease from 2.4 residents per household in 2018, to 2.3 in 2028. The numbers of one-person households and couple-without-children households are projected to increase.

Council planning also considers non-resident demand for holiday home properties or temporary worker accommodation and assumes that each settlement will maintain the current proportion of dwellings which are used for these purposes.

The data sources and methods for calculating residential demand are discussed on pages 9-12 and it is assumed that the method we use is the best way of estimating what this demand will be in reality. It is assumed that the method of allocating area unit projections across the 17 settlements and Ward remainder areas of Tasman District is representative and accurate.

Ageing population

The median age in the Tasman District in 2013 was 44. This is expected to increase to 53 (high projection) /54.1(medium projection) by 2043. The proportion of the population aged 65 years and over is expected to increase from 18% in 2013 to 36% (high projection)/ 37% (medium projection) by 2043. Statistics New Zealand's high population projections assume higher fertility rates than the medium population projections.

The increasing age of the population is likely to have an impact on some residents' ability to pay for services and also the services that they require. The reduction in average household size associated with an ageing population is likely to increase the demand for housing and a number of other Council services.

Key supply assumptions

Development capacity

Council is aiming to ensure sufficient land and services are available to accommodate the projected housing and population growth. The growth in recent years was higher than expected and used up considerable amounts of existing infrastructure capacity. With population and housing growth expected to continue over the next 30 years, there is a need to allow for additional, future capacity in Council's infrastructure, particularly in those areas with higher growth (Richmond, Motueka, Brightwater, Mapua and Wakefield).

Capacity from Special Housing Areas

At the time that the Growth Model review was being finalised, eight Special Housing Areas (SHAs) had been approved by the Minister of Building and Construction, but had not yet been granted resource consent. These SHAs are located in Richmond West, Wakefield, Marahau and Pohara. Council has planned for rollout to exceed demand in areas with SHAs. However, the assumed rate of uptake (i.e. construction of dwellings within these SHAs) is less than that provided by developers in their applications. Rollout has been spread out across several year sets, rather than assuming all new sections will be built on within the next few years.

Waimea Community Dam

It is assumed that the Waimea Community Dam will be built and a secure water supply is achieved, enabling growth to continue in Richmond, Brightwater and Mapua settlement areas.

Business

Key demand assumptions

Council assumes there will be continued growth in demand for business land which has been modelled using Statistics New Zealand's medium growth population projections for Tasman and Nelson for 2018 to 2038. The business land forecasting model from consultants, Property Economics, incorporates national and regional economic and demographic trends to project employment growth and land requirements by activity (industrial, office, retail and services). The employment projections are based on assumed population growth, labour participation rates, and the region's economic performance relative to the rest of the country, with low, medium and high scenarios. The land requirements are based on those employment projections, applying the current employment to floorspace and land ratios by sector, primarily through empirical rating databases. The land requirements assume that development will be 'at grade', i.e. single storey.

The assumption is that the demand forecast by the model is accurate.

The estimated land requirements for retail and commercial services assume that the geographic distribution of the retail network across Nelson/Tasman will be held constant and that this distribution suits the local resident population and wider market demands. In essence, the current role and function of the existing centre network in the commercial centre hierarchy across both regions is maintained.

Key supply assumptions

The growth model has assumed some of the projected demand for business land can be accommodated from existing business land vacancies, but has not accounted for potential capacity from other land use inefficiencies, such as vacant commercial or industrial

buildings on existing business land where growth could comfortably and more efficiently be accommodated.

Waimea Community Dam

It is assumed that the Waimea Community Dam will be built and a secure water supply is achieved, enabling growth to continue in Richmond, Brightwater and Mapua settlement areas.

Data sources and methods

Residential

The key components we use to forecast demand for residential units are population projections and household size, as well as an additional factor for non-resident dwelling demand (holiday homes and worker accommodation).

Population growth

Statistics NZ area unit population projections are used to estimate the rate of change for each growth model area's population. As the growth model areas have different geographic boundaries to area unit boundaries, the growth rates of relevant area units have been used (see Appendix 1).

Medium population projections are used for all areas for all years, except for Richmond, Motueka, Mapua, Brightwater and Wakefield, which use the high series of population projections for 2018-2028.

To estimate the 2013 population for each growth model area, we use Census 2013 usually resident population data by meshblock according to the following process:

1. The usually resident population for mesh-blocks which are fully contained within each settlement area are counted.
2. For meshblocks that cross the boundaries of the settlement areas, the usually resident population in the area where the meshblock intersects with the settlement is estimated based on the number of dwellings in the intersecting area, and the average household size for that meshblock.
3. Combining the count of the population falling within complete mesh blocks and the population falling within split mesh blocks gives a total usually resident population for each settlement.
4. To be consistent with the 2013 base year population used for the population projections, each area's Census usual resident population is adjusted using the ratio between Tasman District's 2013 population estimates and Census population.

Statistics NZ produce population projections for five-year periods from the most recent Census year (2013) which don't align with all the Growth Model year sets. Years 0, 10, and 20 align with Statistics NZ population projection years but the following Growth Model years needed to be calculated:

- To estimate the starting population for each growth model area (initialisation values, for 2015/16) the population projections for 2013 and 2018 are interpolated, assuming linear growth.
- To estimate the population for Year 3, 2021, the population projections for 2018 and 2023 are interpolated, assuming linear growth.
- To estimate the population for Year 30, 2048, the 2043 population projections are extrapolated using the trend and ratio between the five-year growth rates for 2033-2043.

Table 3: Population Projections by Settlement and Ward Remainder

Settlement Area Name	Initialisation Values	Year Zero 2017/18	Years 1-3 2018/19 - 2020/21	Years 4-10 2021/22 - 2027/28	Years 11-20 2028/29 - 2037/38	Years 21-30 2038/39 - 2047/48
Brightwater	1997	2076	2180	2412	2585	2737
Coastal Tasman Area	2665	2732	2794	2929	3044	3064
Collingwood	242	244	246	248	242	227
Kaiteriteri	405	417	420	426	426	408
Mapua/Ruby Bay	2174	2238	2331	2539	2695	2783
Marahau	128	131	132	134	134	128
Motueka	7087	7211	7469	8027	8186	8197
Murchison	430	430	430	430	413	363
Pohara/Ligar/Tata Bay	566	571	575	579	565	530
Richmond	14362	14633	15112	16157	16607	16607
Riwaka	620	628	637	649	656	656
St Arnaud	110	113	117	126	134	136
Takaka	1289	1293	1299	1313	1303	1184
Tapawera	292	292	296	299	306	292
Tasman	200	204	208	215	220	220
Upper Moutere	159	163	167	176	184	185
Wakefield	2053	2096	2181	2370	2494	2562
Ward Remainder Golden Bay	3256	3283	3307	3332	3250	3050
Ward Remainder Lakes Murchison	2556	2600	2658	2776	2871	2895
Ward Remainder Motueka	3388	3457	3512	3625	3697	3705
Ward Remainder Moutere Waimea	4613	4724	4826	5047	5222	5232
Ward Remainder Richmond	1690	1733	1777	1878	1986	2094

Household size

Initial values for each growth model area are based on Census 2013 data on the average number of residents in occupied dwellings, for relevant area units. Household size projections for Tasman show a declining trend and it is assumed that all growth model areas experience a decline at the same rate. Generally this means a decrease in average household size of 0.1 every ten years. Because the model is so sensitive to the input and requires data over a three year timeframe, we have assumed a 0.05 reduction from Year 0 to Year 3 and Year 3 to Year 10.

Some growth model areas have had growth in older age groups since 2013 that was significantly lower than the District as a whole. It is assumed that average household size for these areas for Year 0 (2018) is the same as the initialisation value (2016).

Table 4: Household Size Projections by Settlement and Ward Remainder

Settlement Area Name	Initialisation Values	Year Zero 2017/18	Years 1-3 2018/19 - 2020/21	Years 4-10 2021/22 - 2027/28	Years 11-20 2028/29 - 2037/38	Years 21-30 2038/39 - 2047/48
Brightwater	2.8	2.8	2.75	2.7	2.6	2.5
Coastal Tasman Area	2.6	2.5	2.45	2.4	2.3	2.2
Collingwood	2.3	2.2	2.15	2.1	2	1.9
Kaiteriteri	2.3	2.3	2.25	2.2	2.1	2
Mapua/Ruby Bay	2.4	2.3	2.25	2.2	2.1	2
Marahau	2.3	2.3	2.25	2.2	2.1	2
Motueka	2.4	2.4	2.35	2.3	2.2	2.1
Murchison	2.1	2	1.95	1.9	1.8	1.7
Pohara/Ligar/Tata Bay	2.3	2.2	2.15	2.1	2	1.9
Richmond	2.6	2.6	2.55	2.5	2.4	2.3
Riwaka	2.4	2.4	2.35	2.3	2.2	2.1
St Arnaud	2.2	2.2	2.15	2.1	2	1.9
Takaka	2.3	2.2	2.15	2.1	2	1.9
Tapawera	2.5	2.5	2.45	2.4	2.3	2.2
Tasman	2.5	2.4	2.35	2.3	2.2	2.1
Upper Moutere	2.7	2.6	2.55	2.5	2.4	2.3
Wakefield	2.9	2.8	2.75	2.7	2.6	2.5
Ward Remainder Golden Bay	2.3	2.2	2.15	2.1	2	1.9
Ward Remainder Lakes Murchison	2.4	2.3	2.25	2.2	2.1	2
Ward Remainder Motueka	2.5	2.4	2.35	2.3	2.2	2.1
Ward Remainder Moutere Waimea	2.6	2.5	2.45	2.4	2.3	2.2
Ward Remainder Richmond	2.9	2.8	2.75	2.7	2.6	2.5

Dwellings for non-residents

For each settlement and ward remainder area, the model estimates the proportion of dwellings which are used by people who don't usually reside permanently in Tasman District (or who live in one part of the District and own a holiday home in another part of the District). The demand for dwellings by non-residents is not captured in the population projections, which only cover the usually resident population.

There is a significant proportion of holiday homes, and a corresponding increase in the population during holiday seasons, in the following settlements: St Arnaud, Kaiteriteri, Marahau, Pohara/Ligar Bay/Tata Beach, and Collingwood.

The proportion is estimated using the dwellings counts dataset. This dataset was initially based on dwelling numbers from Council's rating database for a previous iteration of the growth model. Since then, the dataset has been progressively updated using building consents for new dwellings, and estimates the base year count of dwellings for each settlement area and ward remainder area.

Subtracted from that count is the estimated number of dwellings occupied by residents, based on estimated resident population and household size. The remaining number of dwellings provides the proportion of dwellings for non-residents.

This 'holiday home' proportion is included in the demand calculations in the model for all settlement and ward remainder areas with the assumption that the 'holiday home' proportion is maintained in future years.

The dwellings counts dataset from Council's rating database has been historically derived from the valuation assessments in the base year, and is known to have some inaccuracies. The rating database was not designed to provide this information and therefore it is a source of uncertainty through limited accuracy.

Development capacity

Development capacity is calculated for settlement areas by splitting the area into smaller sections, known as Development Areas (DA). Each DA is firstly assessed for developability, taking into account land use constraints and opportunities, such as hazard risk, network services and settlement form. Categorising land in developable DAs into the necessary computational categories (existing lots, buildings, roads, greenspace or schools) is a difficult undertaking because of the variations in DA circumstances and limitations in the range and spatial resolution of the many spatial datasets. There are also parcels that fit under none of the categories or that have been considered non-developable and are excluded from the dataset. There are also a number of land parcels where ownership and valuation assessment data is incomplete or unresolved. We have attempted to reduce the variance between DA area and the sum of the existing lot, road, greenspace and school areas to less than an absolute variance of 5%. This has required some manual intervention, and the creation of another area category called "exclusions". Land that is included in "exclusions" is land that is not developable. This might include:

- land under rivers or other surface water
- untitled land on the coastal margins
- some greenspace that is public conservation land
- land which is too steep to develop
- secondary flow paths
- land where the valuation assessment is incomplete
- land that is Crown land
- land with Council assets.

Ward Remainders

The rollout for most Ward Remainders has been assumed to equal demand. Ward Remainder rollout numbers are needed for Transport Development Contributions, Reserve Financial Contributions, and rating unit calculations. The rollout for Ward Remainder Lakes Murchison are lower than demand, as the calculated demand was unrealistically high in most years when compared with recent building consent trends.

Business

The Property Economics model produced projected demand in the form of areas of land for three different types of business (industrial, office, retail). The Growth Model requires demand to be expressed in the form of a number of lots. To convert the area of land demanded to the number of lots demanded an estimate of the average or median lots size for the different categories of business was required. In the absence of any available data on the average or median lot sizes, staff collectively used their judgement and experience to estimate the average lot sizes. These were then used to calculate the demand. It is assumed that the ratios used to convert demand in area of land to demand in number of lots are appropriate.

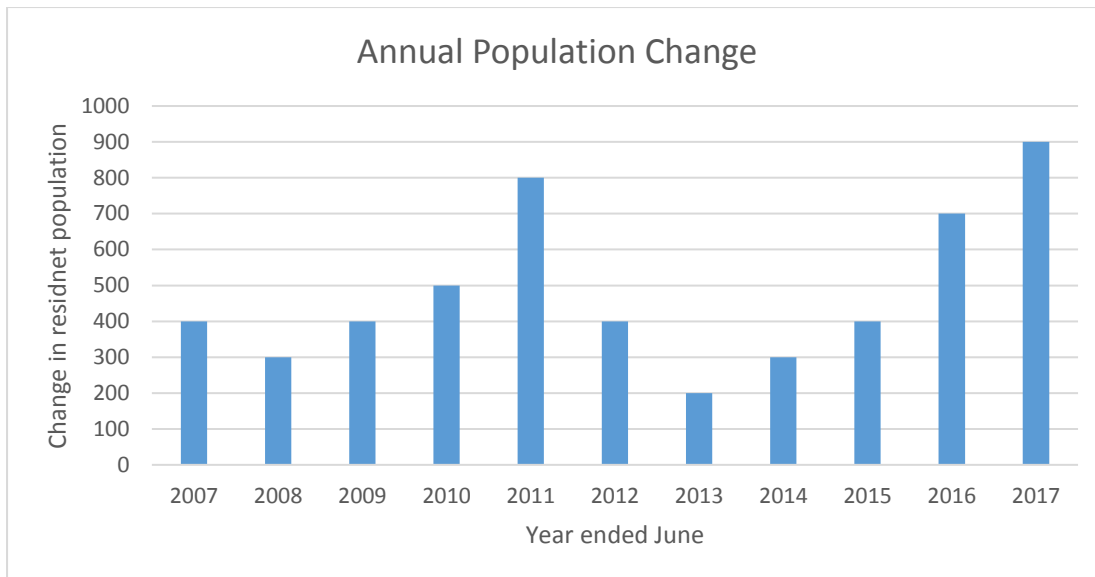
The Property Economics Model report noted that, under the zoned distribution scenario, Brightwater has an elevated industrial land demand due to the Carter Holt Harvey Mill being zoned industrial. This is a 'one off' anomaly and the estimated land requirements for Brightwater are more appropriately added to Richmond's future requirements (the adjacent settlement area with significantly more growth). It was however assumed that the future demand for industrial land in Brightwater was better estimated by assessing the demand for industrial land per head of population through the different time sets in Wakefield and applying it via the projected population in each time set for Brightwater.

It is assumed that the projected economic structure and size and employment numbers are sufficiently credible to support a business (urban employment) forecast demand context i.e. that the outputs from the Property Economics model are credible.

Data verification

The inputs and outputs have been checked against recent trends in population and dwelling growth, and against Statistics New Zealand projections.

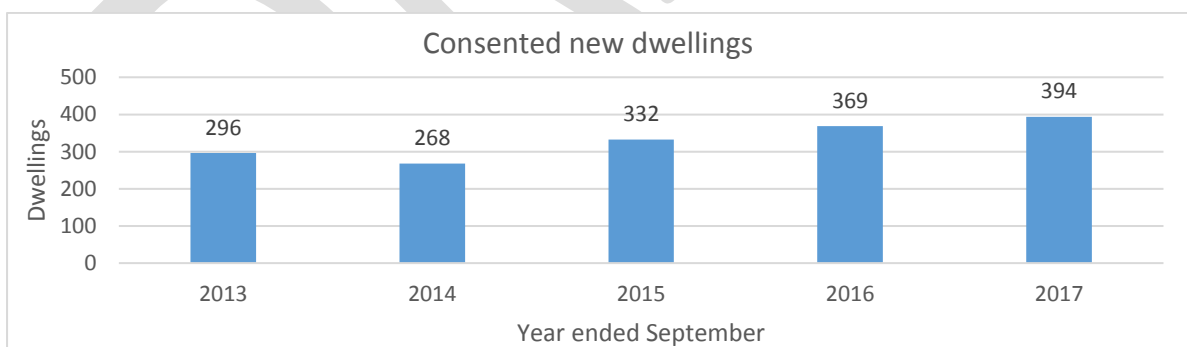
In recent years, Tasman has experienced increasing rates of population growth. The average annual population increase over the three years to June 2016 was 467, while the annual average over the last ten years was 440 (which included an increase in 2011 following the Canterbury earthquakes).

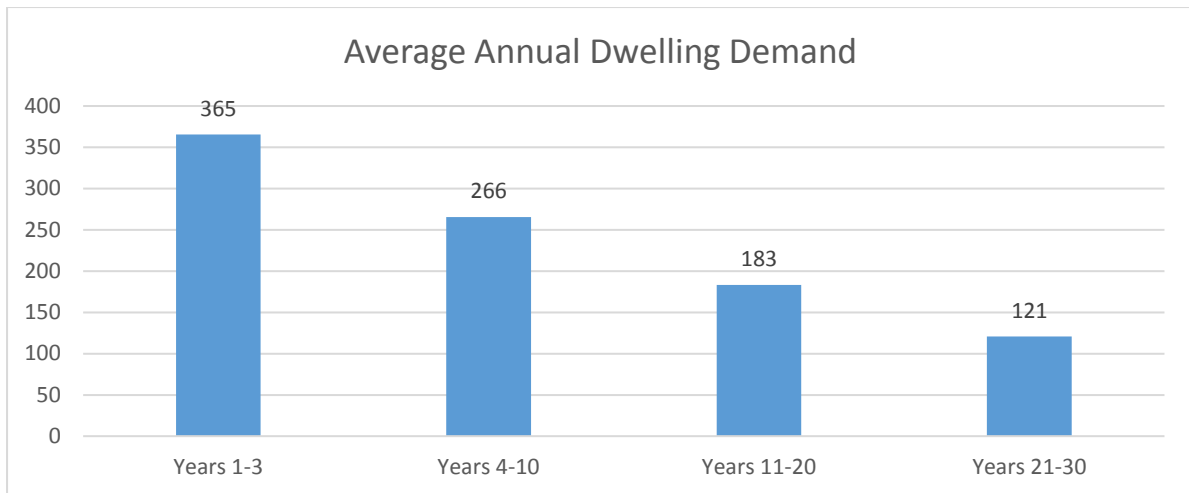


The population projections used in the growth model project population growth of 467 residents a year for 2018-2023, then by 416 for 2023-2028. The use of high growth projections for Richmond, Brightwater, Wakefield, Motueka, and Mapua/Ruby Bay, which make up 55% of the District’s population, and medium growth projections for the rest of the District, results in Council’s projections being about halfway between Statistics New Zealand’s medium and high projections series.

Since the completion of the growth model process for the Long Term Plan 2018-2028, Statistics New Zealand has released provisional population estimates for Tasman District which estimated population growth of 900 new residents for the year to June 2017.

In recent years, Tasman has also experienced increasing numbers of new dwellings being issued with a building consent. The average annual increase in the three years to June 2017 was for 365 new dwellings. The average over the last ten years was 291 new dwellings a year.





The growth model projects demand for new dwellings to be an average of 365 a year for Years 1-3 (2018-2021), dropping to 266 a year for 2021-2028.

Dwelling demand is projected to continue at a higher rate than population growth due to trend towards fewer residents per household and the proportion of dwellings required for seasonal visitors (e.g.holiday homes).

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Appendix 1: Area Units used to calculate population growth for Growth Model Areas

Statistics NZ area unit population projections are used to estimate the rate of change for each growth model area's population. As the growth model areas have different geographic boundaries to the area unit boundaries, the growth rates of the following area units have been used. These are the area units which overlap or intersect with the growth model areas.

Growth Model Area	Area Units
Brightwater	Brightwater
Coastal Tasman Area	Mapua, Wai-iti, Motueka Outer
Collingwood	Golden Bay
Kaiteriteri	Kaiteriteri
Mapua/Ruby Bay	Mapua
Marahau	Kaiteriteri
Motueka	Motueka East, Motueka West
Murchison	Murchison
Pohara/Ligar Bay/Tata	Golden Bay
Richmond	Richmond East, Richmond West, Hope, Ranzau, Aniseed Hill
Riwaka	Riwaka
St Arnaud	Lake Rotoroa
Takaka	Takaka
Tapawera	Tapawera
Tasman	Motueka Outer
Upper Moutere	Wai-iti
Wakefield	Wakefield
Ward Remainder Golden Bay	Golden Bay
Ward Remainder Lakes Murchison	Golden Downs, Lake Rotoroa
Ward Remainder Motueka	Motueka Outer and Kaiteriteri
Ward Remainder Moutere-Waimea	Motueka Outer and Wai-iti
Ward Remainder Richmond	Ranzau and Richmond Hill