



Tararua District land assessment

Tararua District Council

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Executive Summary

To understand its future residential land deficit, Tararua District Council engaged Business and Economic Research Limited (BERL) to project future demand against supply for its four major centres: Woodville, Dannevirke, Eketāhuna, and Pahiatua.

Additional land is required to accommodate future population growth

Additional land is required across Tararua District's four main towns to accommodate future population growth. The size of the gap between residential land demand and supply depends on whether each respective town faces medium, high, or aspirational population growth out to 2055. Collectively, under the medium scenario, an additional 47 hectares will be needed; under the high scenario, an additional 94 hectares will be needed; for the aspirational scenario, an additional 117 hectares will be needed.

Table 1 Additional residential land required (ha), by town, by 2055

Town	Population growth scenario		
	Medium (ha)	High (ha)	Aspirational (ha)
Dannevirke	18	41	50
Woodville	11	19	26
Pahiatua	13	22	27
Eketāhuna	5	12	14
Total	47	94	117

Source: BERL

No additional land supply

Across all four towns, residential land is at capacity, with no additional supply, greenfield developments, or significant infill expected.

Population growth will be driven by connectivity and business activity

Population growth will be boosted by enhanced connectivity via the Manawatū Tararua Highway which opened in June 2025, as well as expected increased business activity in the district.

Need for additional land and rezoning

To meet projected population growth, rezoning of existing land is needed to ensure adequate supply of land for new residential areas. This means that collectively, irrespective of the population growth scenario, between 47 and 117 hectares of land will need to be rezoned.

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1 Introduction

1.1 Purpose and objective

To understand the future residential land deficit, Tararua District Council engaged Business and Economic Research Limited (BERL) to project future residential demand against supply for its four major centres: Woodville, Dannevirke, Eketāhuna, and Pahiatua.

Tararua District is the third-largest district in New Zealand by area, covering 424,000 hectares, with four main urban areas: Dannevirke, Woodville, Eketāhuna, and Pahiatua. These urban areas are surrounded by a large rural community. Dannevirke is the largest community in Tararua and is well serviced with a modern hospital, three secondary schools, and a growing commercial sector.

Tararua District Council is proposing to rezone land from rural to residential in the townships of Dannevirke, Woodville, and Pahiatua to provide for future growth. Much of the land in need of rezoning contains highly productive land. Tararua District Council is required to demonstrate a clear need for the land to be rezoned, as prescribed by the National Policy Statement for Highly Productive Land.

Te Ahu a Turanga-Manawatū Tararua Highway has become a key gateway to Tararua. Since this route was opened in June 2025, it has significantly improved Tararua's connection to the rest of the Manawatū-Whanganui region.

1.2 Approach

1.3 Data sources and detailed methodology

Section 6 of our report details the data sources, methodology, and assumptions for our residential land model.

1.3.1 Residential land supply

First, we assess current land zoned as residential for each of the four main towns, including land that in 2025 is likely to be vacant, by identifying for each town the proportion of new infill dwellings and known residential developments.

For each of the four main towns, unless further land is zoned residential, we concluded that no further additional supply of residential land is available for development, and that infill housing would need to be developed to enable further population growth.

We therefore assume no change in residential land supply out to 2055:

- No greenfield residential developments are planned
- No infill housing is expected to occur, unless it is the only development option
- No land within the currently zoned residential land is vacant and available for greenfield residential developments.

1.3.2 Residential land demand

Second, population growth is projected for each of the towns. Projections are based on Statistics New Zealand population projections from 2023 out to 2055, adjusted to include other factors that may influence the population growth in each town. Changes in population are converted into additional dwellings, and ultimately into residential and rural residential land required to place these additional dwellings.

Scenarios

For each of the Tararua District’s four main towns, we developed three scenarios, using different Statistics New Zealand population projections and economic scenarios from the 2024 BERL long-term forecasts for Tararua District Council.

Table 2 Overview of scenario approach

Scenario	Statistics NZ population projections	Adjustments for BERL's long-term economic forecasts	Adjustments for road investments
Medium	Medium projections	Business as usual (BAU) scenario	Manawatū Tararua Highway
High	High projections	Business as usual (BAU) scenario	Manawatū Tararua Highway
Aspirational	High projections	Aspirational scenario	Manawatū Tararua Highway

Source: BERL

1.3.3 Residential land demand-supply gap

Finally, the change in land required to meet future population demand under each scenario is compared to the land available. The estimated gap between demand and supply of residential land in each town, and according to the scenario, represents the required additional land to be zoned residential to cater for future population growth.

Estimated residential land required to cater for population growth does not include land required for roading to the new dwellings or land required for infrastructure to support the new dwellings.

2 Dannevirke

2.1 Overview

Table 3 Dannevirke assessment overview, by 2055

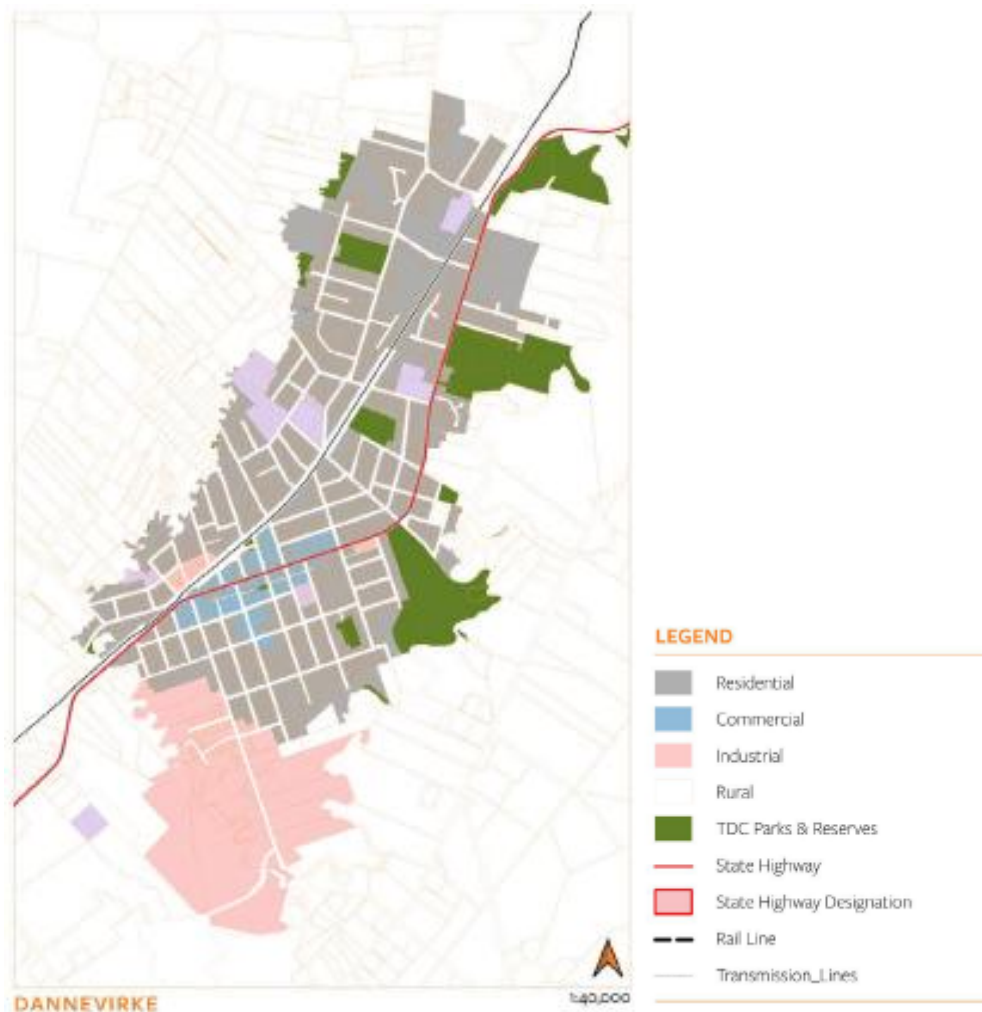
Assessment	Scenario	Medium	High	Aspirational
Residential land supply	Residential zoned land (ha)		320.6	
Residential land demand	Projected population increase	610	1,500	1,830
	New dwellings required	259	615	751
Residential demand-supply gap	Additional residential land required (ha)	18	41	50

Source: BERL

2.2 Residential land supply

Dannevirke has 320.6 hectares of land currently zoned residential under the District Plan. The council is aware that there is a very wide variety of activities being undertaken within this zone (including commercial and industrial activities). This zoning of Dannevirke is shown in Figure 1.

Figure 1 Map of Dannevirke zoned land, 2024



Source: Tararua District Council Urban Growth Strategy 2024

The commercial centre of Dannevirke has commercial zoning, while most industrial activities are contained within (or very close to) the existing industrial zone to the south of town.

Dannevirke follows a typical urban form, with the greatest density of land parcels close to the commercial centre. Throughout the built area, there is a significant portion of properties in the 800 to 1,500 square metre category, typically appropriate for infill subdivision. There are only a few properties within the urban area greater than 1,500 square metres, and these tend to flank the town to the west.

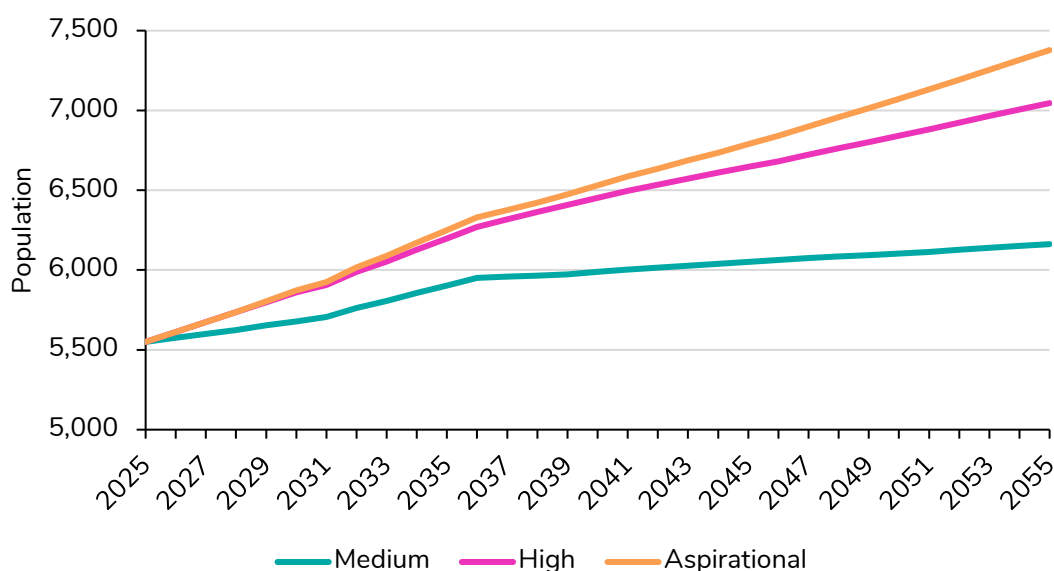
2.3 Residential land demand

As of the 2023 Census, Dannevirke had 5,580 people and 2,265 households, or 2.5 people per household. In addition, 2,472 of these individuals were employed, or 44.3 percent of the town's population. Between the 2023 Census and 2025, Dannevirke's population had decreased by 30 people or 0.3 percent per annum.

2.3.1 Population projections

We project that the population of Dannevirke would increase by 610 people under the medium scenario by 2055, by 1,500 people under the high scenario, and by 1,830 under the aspirational scenario.

Figure 2 Population projections for Dannevirke, 2025 to 2055



Source: BERL and Statistics New Zealand

Both high and aspirational scenarios would see Dannevirke grow to around the aspirational target – expressed by the council in the 2024 Urban Growth Strategy – of 7,000 people.

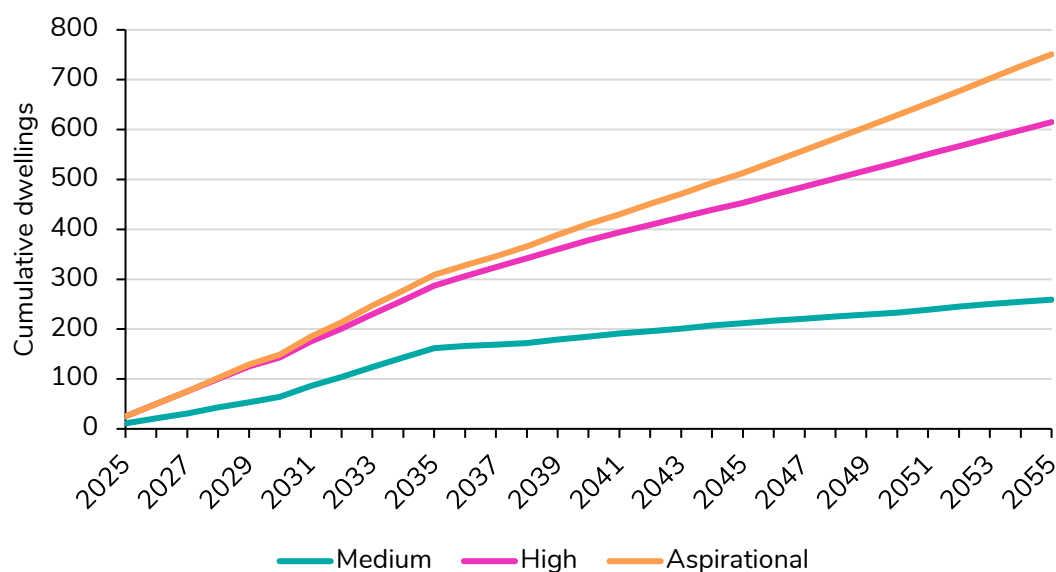
Under the medium scenario, we project an annual population growth of 0.3 percent, which is in line with the annual growth between the 2018 Census and the 2023 Census, which saw the population increase by 72. For the high scenario, we project an annual growth of 0.8 percent per annum, and 1.0 percent per annum for the aspirational scenario.

2.3.2 New dwellings required

The number of new dwellings in 2055 for the medium scenario is 259, while for the high scenario it is 615. For the aspirational scenario, 751 new dwellings are needed to house the additional 1,830 people in Dannevirke.

New dwellings required are then converted into hectares of land needed for residential land (not including land needed for roads and other infrastructure), to assess the gap between demand and supply.

Figure 3 Cumulative count of new dwellings required in Dannevirke, 2025 to 2055

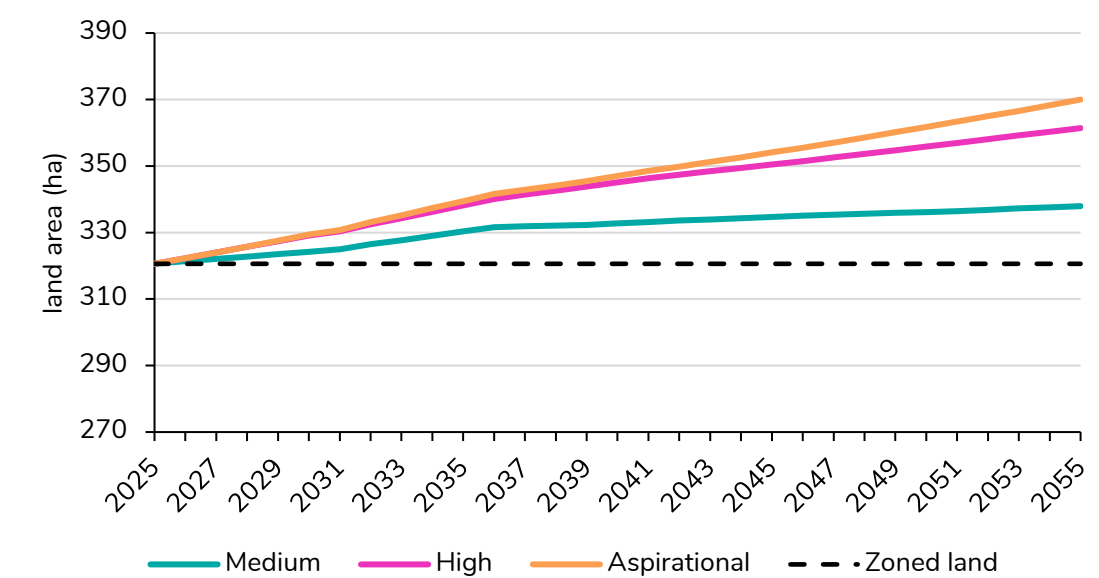


Source: BERL

2.4 Residential demand-supply gap

Under the medium scenario, 17 hectares of additional land will be required by 2055, under the high scenario an additional 41 hectares, and an additional 49 hectares for the aspirational scenario.

Figure 4 Total amount of land required for residential dwellings in Dannevirke, 2025 to 2055



Source: BERL and Tararua District Council

3 Woodville

3.1 Overview

Table 4 Woodville assessment overview, by 2055

Assessment	Scenario	Medium	High	Aspirational
Residential land supply	Residential zoned land (ha)		93.6	
Residential land demand	Projected population increase	360	640	890
	New dwellings required	164	280	388
Residential demand-supply gap	Additional residential land required (ha)	11	19	26

Source: BERL

3.2 Residential land supply

Woodville has 93.6 hectares of land currently zoned residential under the District Plan. Only a small area is zoned commercial within Woodville, clustered tightly in the centre of town. However, commercial activity has begun to stretch out along State Highway 2 in residential zoned land. The small area of industrial zoning in the south-east of the town is largely unusable due to flooding hazards.

Figure 5 Map of Woodville zoned land, 2024



Source: Tararua District Council Urban Growth Strategy 2024

Woodville has numerous sections within the town, up to 1,500 square metres in size. There are relatively few properties in the 1,500 to 5,000 square metre category, with most land immediately adjacent to town being large properties over 0.5 hectares.

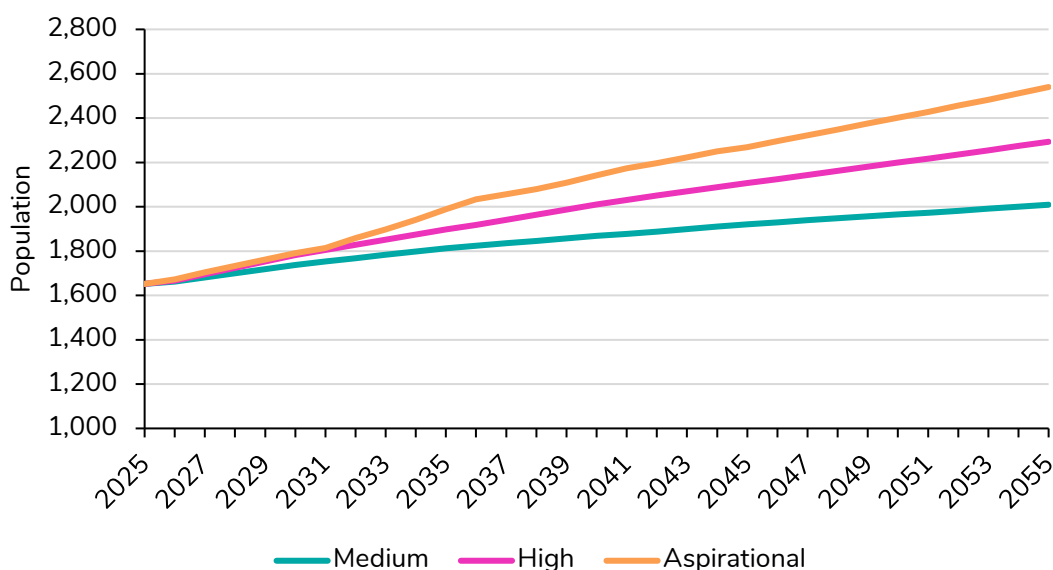
3.3 Residential land demand

As of the 2023 Census, Woodville had 1,662 people and 690 households, or 2.4 people per household. In addition, 717 of these individuals were employed, or 43.1 percent of the town's population. Between the 2023 Census and 2025, Woodville's population has decreased by 10 people or 0.3 percent per annum.

3.3.1 Population projections

We project that the population of Woodville would increase by 360 people under the medium scenario by 2055, by 640 people under the high scenario, and by 890 under the aspirational scenario.

Figure 6 Population projections for Woodville, 2025 to 2055



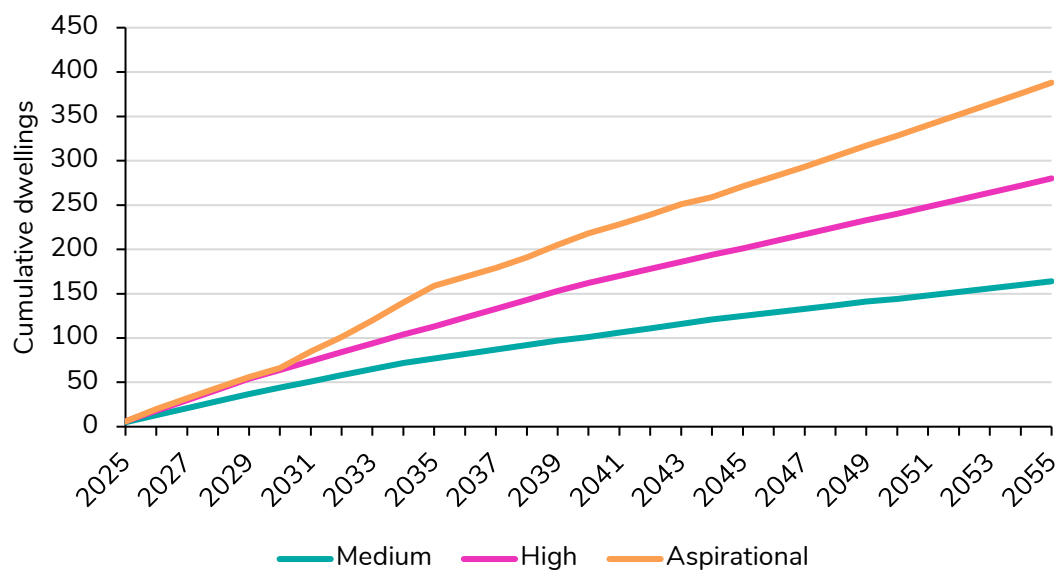
Source: BERL and Statistics New Zealand

In terms of population growth across the 30 years, under the medium scenario we project annual growth of 0.7 percent, which is half the annual growth between the 2018 Census and the 2023 Census, when Woodville grew by 114 people or 1.4 percent per annum. For the high scenario, we are projecting annual growth of 1.1 percent per annum, and under the aspirational scenario this annual growth projection is 1.4 percent per annum.

3.3.2 New dwellings required

Additional population growth for Woodville is converted into new housing. The number of new dwellings in 2055 for the medium scenario is 164, while for the high scenario it is 280. For the aspirational scenario, 388 new dwellings are needed to house the additional 890 people in Woodville.

Figure 7 Cumulative count of new dwellings required in Woodville, 2025 to 2055



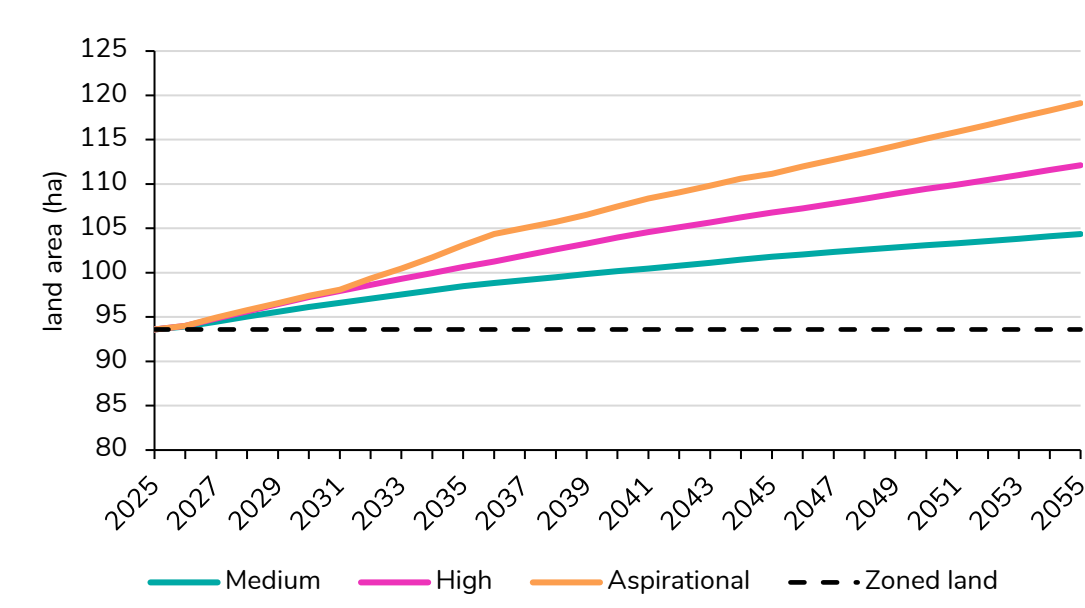
Source: BERL

New dwellings required are then turned into hectares of land needed for residential land (not including land needed for roads and other infrastructure), to assess the gap between demand and supply.

3.4 Residential demand-supply gap

Eleven hectares of additional land will be required under the medium scenario by 2055, 19 hectares under the high scenario, and an additional 26 hectares under the aspirational scenario.

Figure 8 Total amount of land required for residential dwellings in Woodville, 2025 to 2055



Source: BERL and Tararua District Council

4 Pahiatua

4.1 Overview

Table 5 Pahiatua assessment overview, by 2055

Assessment	Scenario	Medium	High	Aspirational
Residential land supply	Residential zoned land (ha)		150.3	
Residential land demand	Projected population increase	440	795	980
	New dwellings required	192	327	406
Residential demand-supply gap	Additional residential land required (ha)	13	22	27

Source: BERL

4.2 Residential land supply

Pahiatua has 150.3 hectares of land currently zoned residential under the District Plan. Activity within Pahiatua is consistent with the zoning, although like Woodville there has been growth of both commercial and light-industrial activities along the state highway. The industrial zoned area in Pahiatua is very small; it is constrained by surrounding residential development and a marae.

Figure 9 Map of Pahiatua zoned land, 2024



Source: Tararua District Council Urban Growth Strategy 2024

In Pahiatua, the most common parcel size sits within the 800 to 1,500 square metre category, with higher-density properties clustered around the town centre and State Highway 2. There are relatively limited properties in the 1,500 to 5,000 square metre category, with most land immediately adjacent to town being large properties over 0.5 hectares.

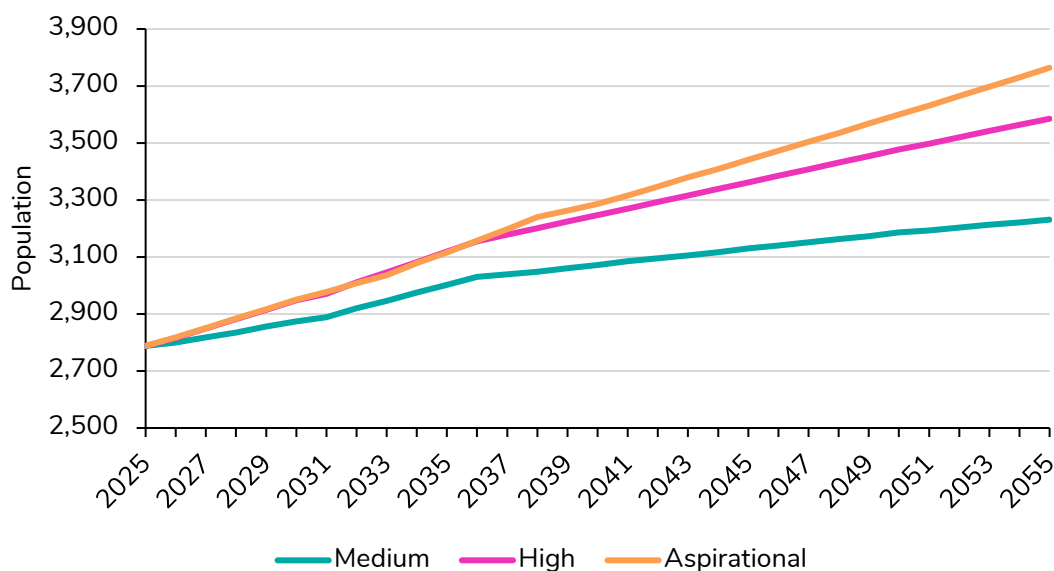
4.3 Residential land demand

As of the 2023 Census, Pahiatua had 2,838 people and 1,092 households, or 2.6 people per household. In addition, 1,227 of these individuals were employed, or 43.7 percent of the town's population. Between the 2023 census and 2025, Pahiatua's population has decreased by 50 people or 0.9 percent per annum.

4.3.1 Population projections

We project that the population of Pahiatua would increase by 440 people under the medium scenario by 2055, by 800 people under the high scenario, and by 980 under the aspirational scenario.

Figure 10 Population projections for Pahiatua, 2025 to 2055



Source: BERL and Statistics New Zealand

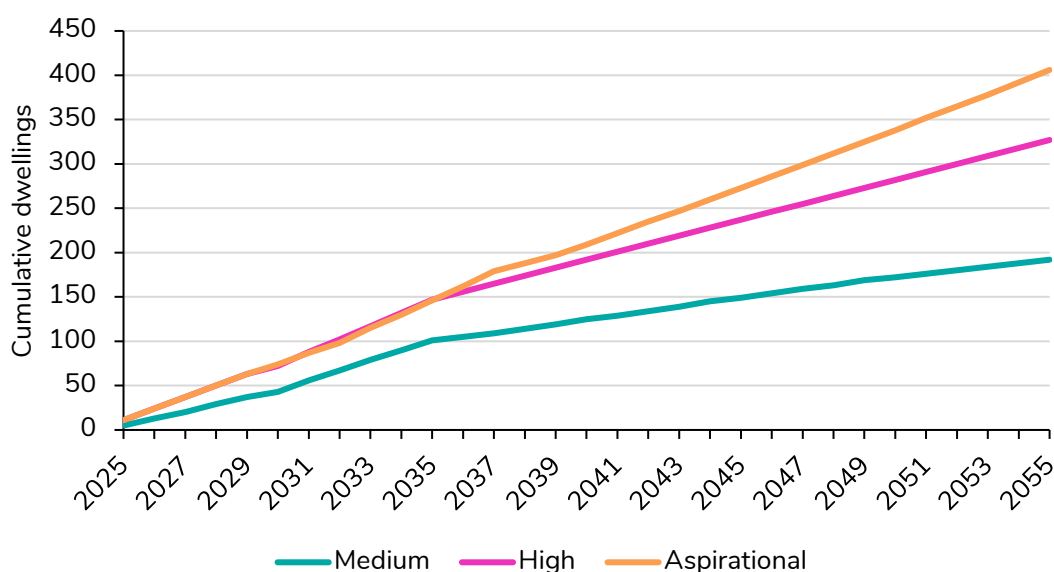
In terms of population growth across the 30 years, under the medium scenario we project annual growth of 0.5 percent, which is half the annual growth between the 2018 Census and the 2023 Census, which saw growth of 156 people or 1.1 percent per annum. For the high scenario, we are

projecting annual growth of 0.8 percent per annum, and under the aspirational scenario this annual growth projection is 1.0 percent per annum.

4.3.2 New dwellings required

Additional population growth for Pahiatua is converted into new housing. The number of new dwellings in 2055 for the medium scenario is 192, while for the high scenario it is 327. For the aspirational scenario, 406 new dwellings are needed to house the additional 980 people in Pahiatua.

Figure 11 Cumulative count of new dwellings required in Pahiatua, 2025 to 2055



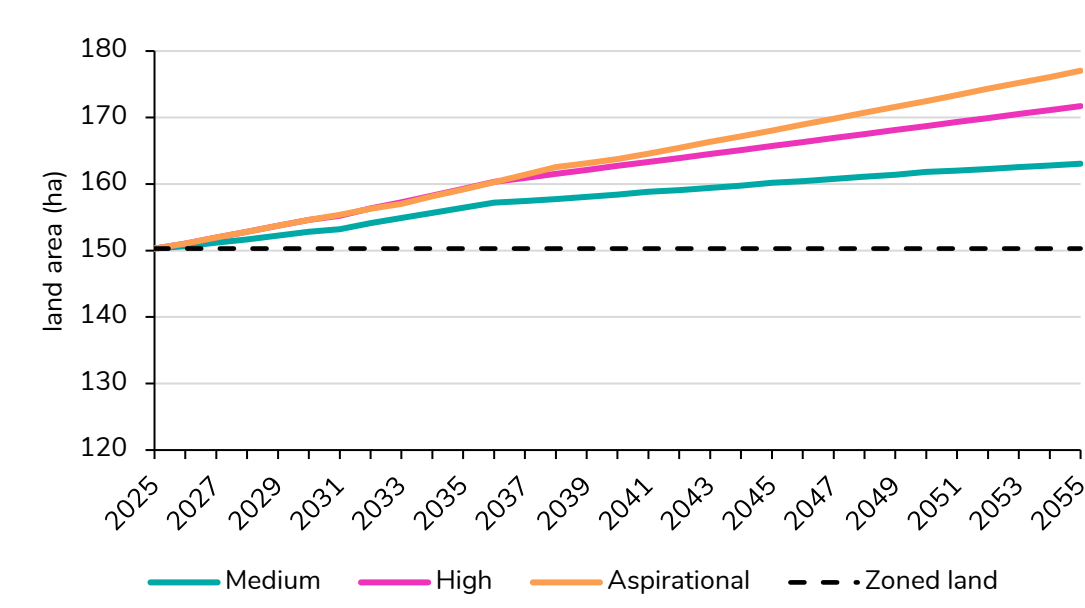
Source: BERL

New dwellings required are then turned into hectares of land needed for residential land (not including land needed for roads and other infrastructure), to assess the gap between demand and supply.

4.4 Residential demand-supply gap

Thirteen hectares of additional land will be required under the medium scenario by 2055, 21 hectares under the high scenario, and an additional 27 hectares under the aspirational scenario.

Figure 12 Total amount of land required for residential dwellings in Pahiatua, 2025 to 2055



Source: BERL and Tararua District Council

5 Eketāhuna

5.1 Overview

Table 6 Eketāhuna assessment overview

Assessment	Scenario	Medium	High	Aspirational
Residential land supply	Residential zoned land (ha)		36.1	
Residential land demand	Projected population increase	160	400	440
	New dwellings required	76	179	196
Residential demand-supply gap	Additional residential land required (ha)	5	12	14

Source: BERL

5.2 Residential land supply

Eketāhuna has 36.1 hectares of land currently zoned residential under the District Plan. Despite the paper cadastral layout of Eketāhuna, there is minimal commercial zoning and currently no industrial zoning. A small number of properties adjacent to State Highway 2 are within a commercial zone.

Figure 13 Map of Eketāhuna zoned land, 2024



Source: Tararua District Council Urban Growth Strategy 2024

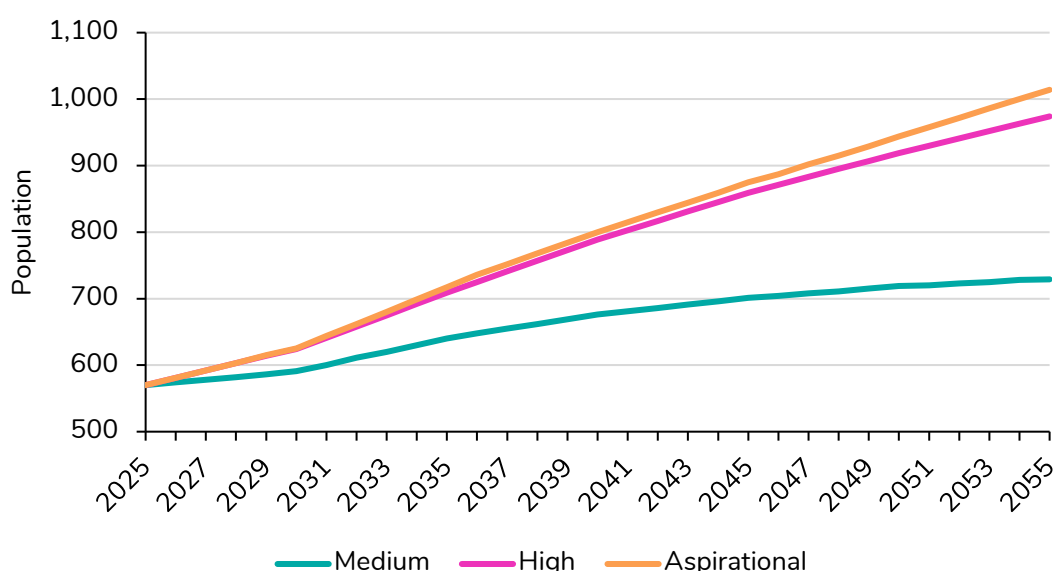
5.3 Residential land demand

As of the 2023 Census, Eketāhuna had 570 people and 219 households, or 2.6 people per household. In addition, 249 of these individuals were employed, or 43.2 percent of the town's population. Between the 2023 census and 2025, Eketāhuna's population has remained unchanged at 570 people.

5.3.1 Population projections

We project that the population of Eketāhuna would increase by 160 people under the medium scenario by 2055, by 400 people under the high scenario, and by 440 under the aspirational scenario.

Figure 14 Population projections for Eketāhuna, 2025 to 2055



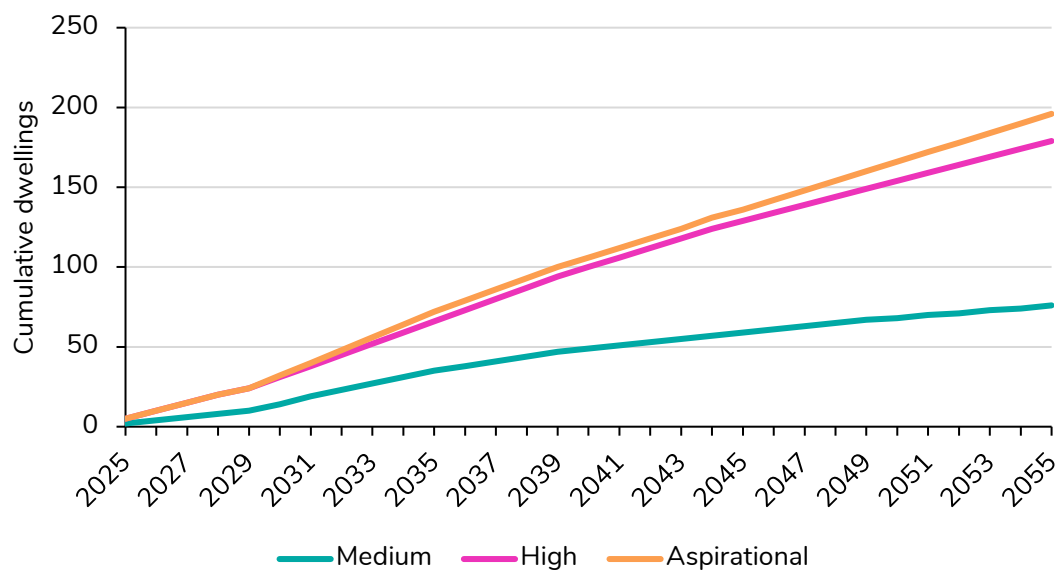
Source: BERL and Statistics New Zealand

In terms of population growth across the 30 years, under the medium scenario we project annual growth of 0.8 percent, which is well under half the annual growth between the 2018 Census and the 2023 Census, which saw growth of 66 people or 2.5 percent per annum. For the high scenario, we are projecting annual growth of 1.8 percent per annum, and under the aspirational scenario this annual growth projection is 1.9 percent per annum.

5.3.2 New dwellings required

In Figure 15 the additional population growth for Eketāhuna is transformed into new housing. The number of new dwellings in 2055 for the medium scenario is 76 and 179 for the high scenario. For the aspirational scenario, 196 new dwellings are needed to house the additional 440 people in Eketāhuna.

Figure 15 Cumulative count of new dwellings required in Eketāhuna, 2025 to 2055

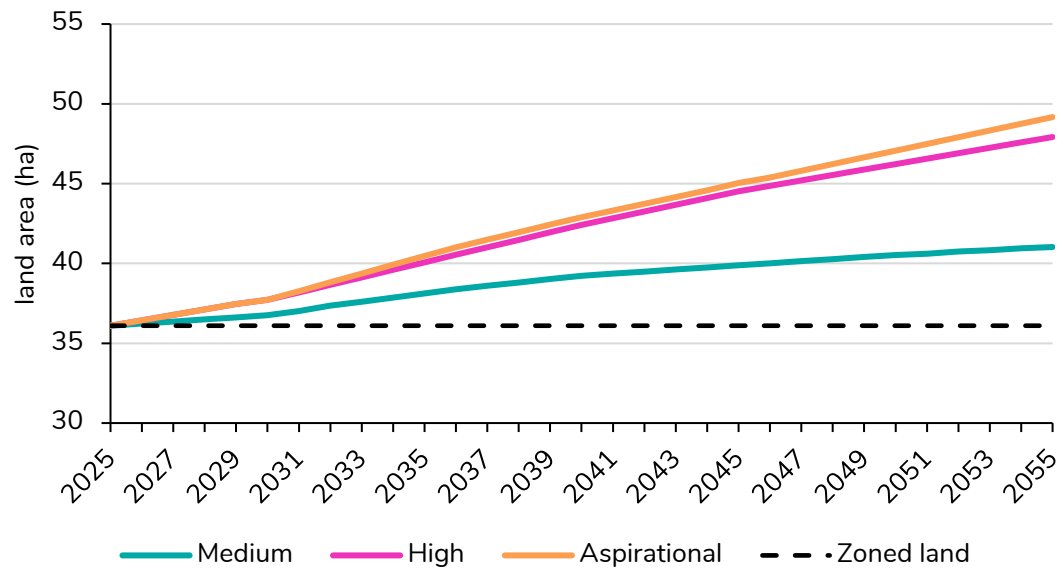


Source: BERL

5.4 Residential demand-supply gap

Five hectares of additional land will be required under the medium scenario by 2055, 12 hectares under the high scenario, and an additional 13 hectares under the aspirational scenario.

Figure 16 Total amount of land required for residential dwellings in Eketāhuna, 2025 to 2055



Source: BERL and Tararua District Council

6 Methodology

This section summarises the datasets and other information used in our residential land modelling, and the source of that information. We also present our methodology to develop and construct the residential land model, and the assumptions for the model.

6.1 Datasets and other information sourced

For our residential land assessments, we used the following datasets:

- Census data on the resident population, resident households, and employment numbers from 2001, 2006, 2013, 2018, and 2023 for the four main towns within the Tararua District
- Statistics New Zealand population projections for 2018 to 2048 for the four main towns within the Tararua District (medium and high) at the statistical area 2 (SA2) level
- Statistics New Zealand population projections characteristics for 2018 to 2048 for the four main towns within the Tararua District (medium and high) including births, deaths, and net migrations numbers underpinning the population projections at the SA2 level
- Statistics New Zealand population estimates for 2018 to 2025 for the four main towns within the Tararua District
- NZTA Manawatū Tararua Highway business case (2019)
- Tararua District Council Urban Growth Strategy (2024).

6.2 Modelling steps

To develop our residential land assessments, we undertook the following steps:

Table 7 Modelling methodology overview

Step	Methodology
Step 1: Statistics New Zealand population projections	Statistics New Zealand population projections provide five-yearly population numbers from 2018 through to 2055, including for 2023. Statistics New Zealand medium population projection is the basis for our medium scenario, and the Statistics New Zealand high population projection is the basis for our high and aspirational scenarios.

Step	Methodology
	Population projections provide five-yearly changes in population, which can be annualised and applied to 2025 resident population numbers.
Step 2: Analysis of population characteristics	Understand where the five-yearly population change is coming from, whether births, deaths, and/or net migration for each of the four towns. Data can be annualised, and can also be used to check against the annual movements from the population projections to ensure consistency.
Step 3: Baseline population projections	Turn the five-yearly population projections into annual numbers and estimate the expected net change in population each year for each of the four main towns, according to Statistics New Zealand's medium or high population projections.
Step 4: Adjust Statistics New Zealand baseline projections, for road infrastructure investments	Determine population uplift for the district arising from the opening of the new Manawatū Tararua Highway between Palmerston North and the Tararua District in June 2025. BERL reviewed the population change from infrastructure projects in other districts, such as Kapiti Coast with the Peka Peka Expressway and Transmission Gully motorway projects providing travel time savings to Wellington. We estimate a 0.2 percent uplift above baseline population growth in the districts, attributed to the new roading infrastructure.
Step 5: Adjust Statistics New Zealand baseline projections, for BERL's employment forecasts	Adjust baseline projections for BERL's local employment projections, based on projections of industrial and commercial land within the Tararua District. Assuming capacity to supply labour for new employment opportunities in the district is limited, new migration of households would be required for additional employment. Medium and high scenarios are adjusted by the BAU employment scenario, and the aspirational scenario for the aspirational employment scenario. Assess and add the projected number of locals in employment against the projected increase in employment occurring from population

Step	Methodology
	increase. Any local employment projection forecasts higher than the expected growth in employed people in the town are added as additional increase in employment and population to the town.
Step 6: Combine baseline projections and adjustments	Combine population increases from steps 3, 4, and 5 – Statistics New Zealand population projections, uplift from Manawatū Tararua Highway, and employment uplift – as the overall net change in population for each town between 2025 and 2055, for each of the three scenarios.
Step 7: Determine new dwellings required	Determine the number of new dwellings required to house the expected annual increase in population for each town, taking the change in annual population and dividing it by the average population by dwelling for each town and rounding up to the nearest whole dwelling. Estimate the population per dwelling over the next 30 years based on population per dwelling data from the 2001, 2006, 2013, 2018, and 2023 censuses. Account for historical trends in population per dwelling. Population per dwelling for the four towns had been stable across the five censuses. Use the average population per dwelling across the five censuses as our average population per dwelling for each town, for each scenario.
Step 8: Determine future land demand	Estimate the land required for new dwellings required. Based on the 2024 Urban Growth Strategy for the Tararua District, the council expects 35 percent of new dwellings to be on 500 square metre residential properties, 50 percent to be on residential 800 square metre properties, and the remaining 15 percent to be on 2,500 square metre rural residential properties. Assume future population growth is catered for through new residential dwellings of 500 and 800 square metres, based on advice from council planners that rural residential properties, which surround the four towns, are difficult to develop in the district (due to the National Policy Statement for Highly Productive Land).

Step	Methodology
	Allocate new dwellings per year into two property categories, 500 square metres (40 percent of new dwellings) and 800 square metre properties (60 percent of new dwellings).
Step 9: Establish the land demand-supply gap	Compare land required to cater for population growth and new dwellings against land already zoned land within each township. Assume no vacant available land for residential development, based on information provided by the Tararua District Council.

Source: BERL

6.3 Assumptions

The following assumptions have been used in developing our residential land assessment model.

Table 8 Assumptions summary

Assumption	Basis
No current greenfield opportunities	Information provided by the Tararua District Council and its knowledge of resource consents and informal interest in residential developments.
Limited demand for infill development	Information provided by the Tararua District Council reflects the character of the townships where interest in infill development has been very limited.
Zero percent of zoned residential land is vacant as of 2025	Information provided by the Tararua District Council reflects our analysis of the satellite images of the towns which show very limited unused space within the current zone of residential land.
Rounding up to the nearest complete dwelling	For example, if the calculation states that 8.2 new dwellings are required to house the additional population that year, we will round up to nine new dwellings required. Overall, this will add up to a small number of additional dwellings being added over the 30 years.
Percentage share of new dwellings for each town by land size is as follows: 40 percent are 500 square meters and 60 percent are 800 square metres	Based on the 2024 Urban Growth Strategy, though with adjustment to reflect advice from planners that lifestyle blocks have limited scope for development, and that future growth is expected to be via residential dwellings.
Additional 20 individuals will migrate to the district each year due to the new Manawatū Tararua Highway	Increase of 0.2 percent for population growth for other districts. For Tararua District that 0.2 percent equates to 20 individuals, subjectively distributed across the four townships based on the driving distance to Palmerston North via the new highway. Woodville will gain 15 people each year, Pahiatua will gain five

Assumption	Basis
	people each year, and Dannevirke and Eketāhuna will gain no additional people each year.
Future population per dwelling for each town is based on the average population per dwelling for each town across 2001, 2006, 2013, 2018, and 2023 censuses	Assessment that population per dwelling across five censuses for each town has remained fairly stable and likely to remain stable into the future. For Dannevirke we assume 2.6 people per dwelling, for Woodville 2.4 people per dwelling, for Pahiatua 2.6 people per dwelling, and for Eketāhuna 2.5 people per dwelling.
Future employment rate (total number of people employed as a percentage of total population) for each town is based on employment rates in the 2018 and 2023 censuses	For Dannevirke we assume an employment rate of 44.3 percent, for Woodville 43.1 percent, for Pahiatua 43.7 percent, and for Eketāhuna 43.2 percent.
Limited capacity to cater for new employment opportunities	Any additional employment projected would require additional migration to the town, to ensure the employment rate stays at its assumed level.
90 percent share of the projected population growth within the Nireaha-Eketāhuna SA2 is attributed to the Eketāhuna township	Statistics New Zealand only publishes population projections down to the SA2 level, not the SA1. Eketāhuna township is made up of three SA1s within the wider Nireaha-Eketāhuna SA2. This assumption is based on a subjective analysis of the historic growth in the wider SA2 and the township, which has seen the township grow by 66 people between the 2018 and 2023 censuses, while the wider SA2 saw its population grow by only 24 people across the same time.

Source: BERL

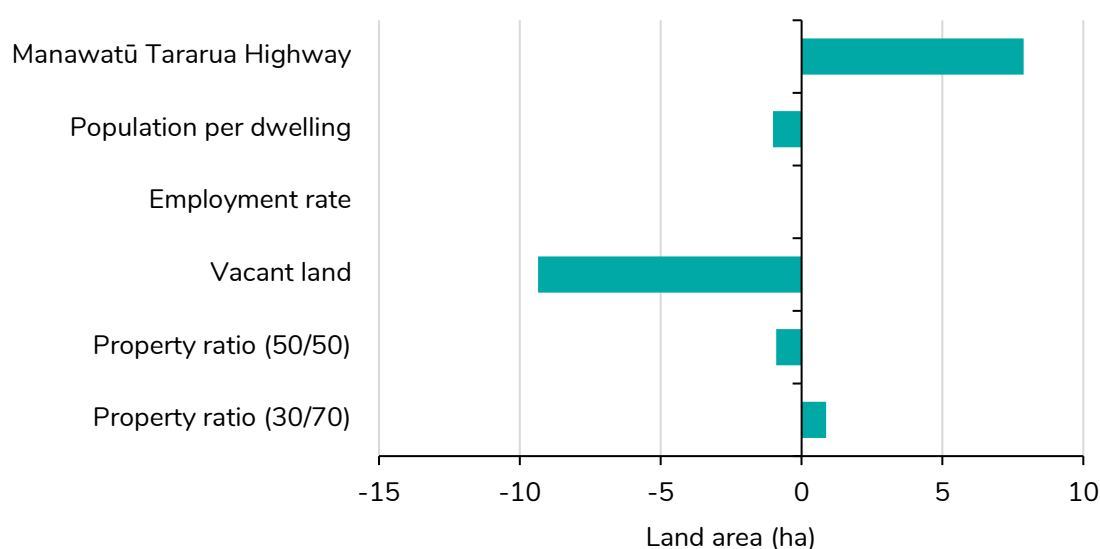
Appendix A Sensitivity analysis

Sensitivity analysis of assumptions underpinning the three scenarios is undertaken for the Woodville township using the high scenario. Five key assumptions drive our population projections. We assume:

- That an additional 20 individuals will migrate to the district each year due to the new Manawatū Tararua Highway
- That future population per dwelling for each town follows the average population per dwelling for each town across 2001, 2006, 2013, 2018, and 2023 censuses
- That the future employment rate (total number of people employed as a percentage of total population) for each town follows their employment rates in the 2018 and 2023 Censuses
- That zero percent of zoned residential land is vacant as of 2025
- That the percentage share of new dwellings for each town by land size is as follows: 40 percent are 500 square meters, 60 percent are 800 square metres; as well as 30 percent are 500 square metres and 70 percent are 800 square metres.

We assess the sensitivity of our population projections and projected land demand for each of these key assumptions. The difference in residential land demand as of 2055 for Woodville under the high scenario, for each sensitivity test, is shown in Figure 17 and explained in Table 9.

Figure 17 Change in land area at 2055 for Woodville high scenario compared to baseline



Source: BERL



Table 9 Sensitivity testing, by key modelling assumption

Assumption	Sensitivity test
Manawatū Tararua Highway	Adjusting the number of additional people arriving in Woodville per year by 10 people alters the overall population in 2055 by 290, or 29 per additional person. Overall, by 2055, adding an additional 290 people will add 7.9 hectares of additional residential land, or an additional 790 square metres of residential land per person added due to the highway for this assumption. Adding or subtracting one person from the assumption will increase or decrease total residential land by 790 square metres.
Population per dwelling	We adjust the population per dwelling by 0.2, moving it from 2.44 to 2.64. This change does not alter population projections, but it does alter the total number of new dwellings needed, thereby decreasing the amount of new residential land needed. As shown in Figure 17, a 0.2 increase in population per dwelling results in a one hectare drop in total residential land in 2055. This effect is cumulative, in that a 0.5 increase in population per dwelling (going from 2.44 to 2.94 people per dwelling) results in 2.9 hectares less of residential land required in 2055, or 0.6 hectares for every 0.1 change. This change in assumption has limited impact on the final amount of residential land required to house the additional population out to 2055, unless there is a large change in this assumption.
Employment rate	This assumption's only impact on the model is on additional population that is added each year to the town from the employment uplift effect. An increase does not have any effect on the Woodville high scenario because the employment uplift for Woodville is zero under this scenario.

Assumption	Sensitivity test
	Decreasing the employment rate from 44.3 percent to 33.3 percent for Dannevirke raises the land required by 1.5 hectares. As the employment rate decreases, the model assumes that the number of new workers in the town is insufficient, with only one-third of them being employed to supply the required labour for the projected new employment in town. More people are required to move to Woodville to make up for the shortage. Overall, our results are very not sensitive to this assumption, with every one percent decrease in the assumption adding around six extra people to the Dannevirke population in 2055, which equates to an additional 150 square metres per one percent decrease.
Vacant land	Changing the percentage of vacant land within the residential land area for Woodville has no impact on the population projections, or the amount of residential land required to house the additional population. The impact is felt only on the total amount of new residential land that is required to be added to the current residential land. For Woodville, changing the amount of vacant land from zero percent to 10 percent will decrease the overall amount of new residential land required by 9.4 hectares or 10 percent of the current 93.6 hectares of residential land. We estimate that a one percent change in the share of vacant residential land in Woodville will alter the total amount of new land by 0.94 hectares.
Share of new dwellings by size of land property	The Urban Growth Strategy suggests the size of properties will be attractive to new buyers, particularly properties averaging 500 square metres (the minimum property size in the district is 350 square metres) and slightly larger properties with an average size of 800 square metres.

Assumption	Sensitivity test
	Information from the growth strategy informed our assumption that 40 percent of new dwellings would be the average 500 square metres and 60 percent would be the larger 800 square metres size. Testing the sensitivity of our model to this ratio, we ran two tests for the Woodville high scenario: first, 50 percent for both 500 square metres and 800 square metres; then 30 percent 500 square metres and 70 percent 800 square metres. Moving the percentage share up or down by 10 percent increases or decreases the overall amount of residential land required in 2055 by around one hectare. The change to the amount of new residential land required in 2055 is minimal for a 10 percent change. A fairly large change would be needed to have more than a minimal impact on the amount of land required.
Source: BERL	

Appendix B Tararua District's main towns

Tararua District is made up of 12 SA2 areas. SA2 is an output geography that aims to reflect communities that interact together socially and economically, and have a name linked to the area. In populated areas, SA2s generally contain similar sized populations.

For the purposes of forecasting the future growth of the four main centres we have used SA2s and SA1s, as shown in Table 10, to create our township areas. Dannevirke has two SA2 areas, Dannevirke West and Dannevirke East, that combine to form the Dannevirke urban area. The Woodville and Pahiatua SA2 areas capture these urban centres.

Because of the smaller size of Eketāhuna's urban centre it is part of the larger Nireaha-Eketāhuna SA2 area which includes a large rural area to the west of the urban centre. For our purposes, we have split the Nireaha-Eketāhuna SA2 area into smaller SA1 areas, which are identified using a unique seven-digit number. Within the Nireaha-Eketāhuna SA2 there are 10 SA1 areas, of which four comprise Eketāhuna, as shown in Table 10.

Table 10 Tararua district towns by statistical areas (SA2 and SA1)

Dannevirke	Woodville	Pahiatua	Eketāhuna
Dannevirke West	Woodville	Pahiatua	7034367
Dannevirke East			7034368
			7034369
			7034370

Source: Statistics New Zealand