



# **Impact of a housing shortage**

## **Assessing the effects for Tauranga City**

**NZIER report to Priority One**

27 February 2020



## About NZIER

---

NZIER is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice.

We undertake and make freely available economic research aimed at promoting a better understanding of New Zealand's important economic challenges.

Our long-established Quarterly Survey of Business Opinion (QSBO) and Quarterly Predictions are available to members of NZIER.

We pride ourselves on our reputation for independence and delivering quality analysis in the right form and at the right time. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review.

NZIER was established in 1958.

## Authorship

---

This report was prepared at NZIER by Christina Leung and Eugene Isack.

It was quality approved by Peter Wilson.

The assistance of Sarah Spring is gratefully acknowledged.

Registered office: Level 13, Willeston House, 22–28 Willeston St | PO Box 3479, Wellington 6140  
Auckland office: Ground Floor, 70 Shortland St, Auckland  
Tel 0800 220 090 or +64 4 472 1880 | [econ@nzier.org.nz](mailto:econ@nzier.org.nz) | [www.nzier.org.nz](http://www.nzier.org.nz)

© NZ Institute of Economic Research (Inc). Cover image © Dreamstime.com  
NZIER's standard terms of engagement for contract research can be found at [www.nzier.org.nz](http://www.nzier.org.nz).

While NZIER will use all reasonable endeavours in undertaking contract research and producing reports to ensure the information is as accurate as practicable, the Institute, its contributors, employees, and Board shall not be liable (whether in contract, tort (including negligence), equity or on any other basis) for any loss or damage sustained by any person relying on such work whatever the cause of such loss or damage.

# 1 Introduction

Priority One has engaged NZIER to assess the economic impact of a housing shortage in Tauranga. This follows findings by Veros Property Services that the city will be undersupplied by almost 1,000 dwellings by 2022, with this gap growing to almost 5,000 dwellings by 2025–2030.<sup>1</sup>

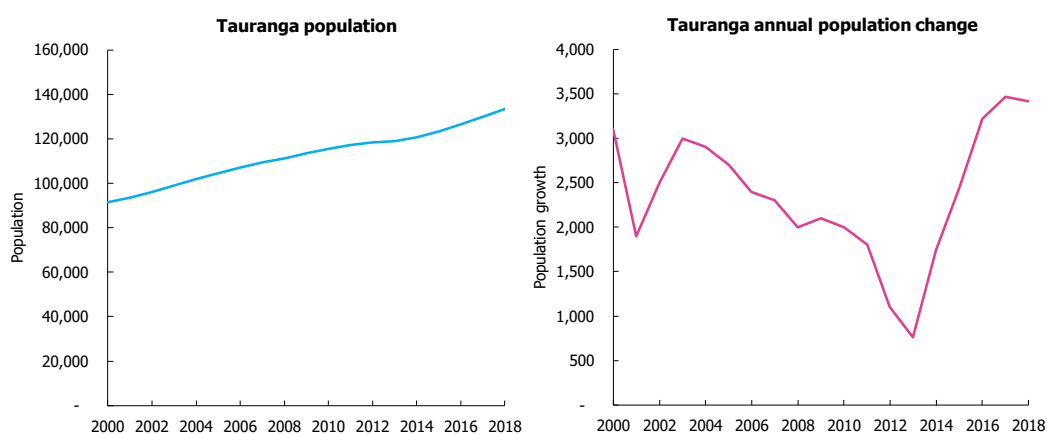
**Table 1 Tauranga City and Western Bay of Plenty face a housing shortage**

	Short-term capacity 1 to 3 years			Medium-term capacity 4 to 10 years		
	Required	Forecast	Difference	Required	Forecast	Difference
New sections	2,793	2,198	-595	6,517	2,353	-4,164
Retirement village (units)	399	708	309	931	474	-457
Multi-units	600	0	-600	1,400	1,234	-166
Intensification	198	174	-24	462	406	-56
<b>Total Dwellings</b>	<b>3,990</b>	<b>3,080</b>	<b>-910</b>	<b>9310</b>	<b>4,467</b>	<b>-4,843</b>

Source: Veros Property Services

Tauranga has experienced continuous but volatile population growth since 2000, with growth accelerating over the past 5 years (Figure 1).

**Figure 1 Annual population growth in Tauranga**

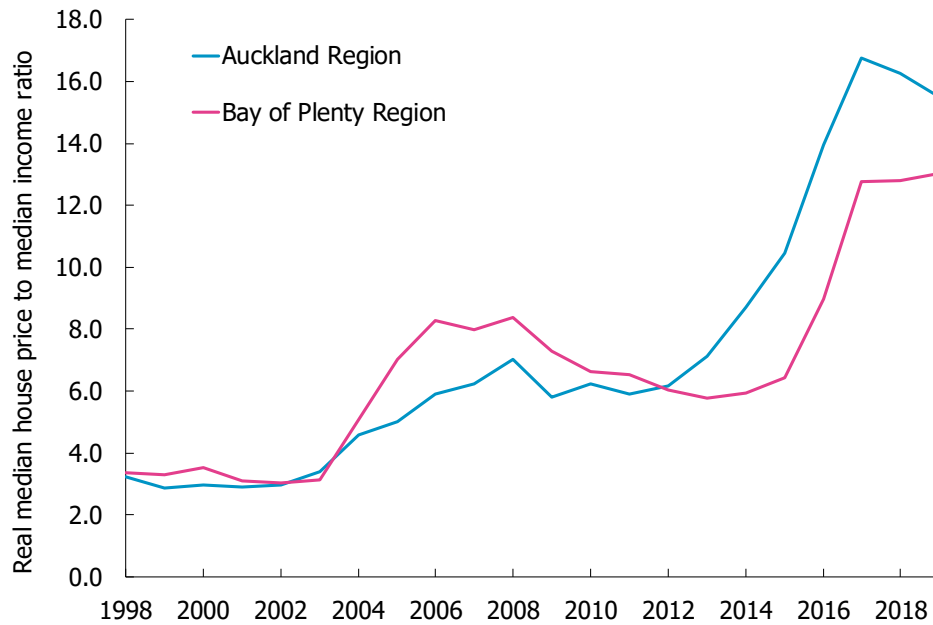


Source: NZIER, Stats NZ

<sup>1</sup> Veros Property Services has estimated that over the short-term (1–3 years), Tauranga and Western Bay of Plenty will be short of 910 dwellings. Over the medium-term (4–10 years) this will increase to 4,843 dwellings.  
[http://econtent.tauranga.govt.nz/data/bigfiles/committee\\_meetings/2019/june/agen\\_uftdc\\_11jun2019.pdf](http://econtent.tauranga.govt.nz/data/bigfiles/committee_meetings/2019/june/agen_uftdc_11jun2019.pdf)

A large part of this strong growth in recent years appears to be driven by spill-over effects from the deterioration in housing affordability in Auckland. The median house price to income ratio in Auckland has diverged from that in the Bay of Plenty Region. For some, the cost of housing will have surpassed the benefits of living in Auckland.

**Figure 2 Geographic spill-over effects of housing affordability**



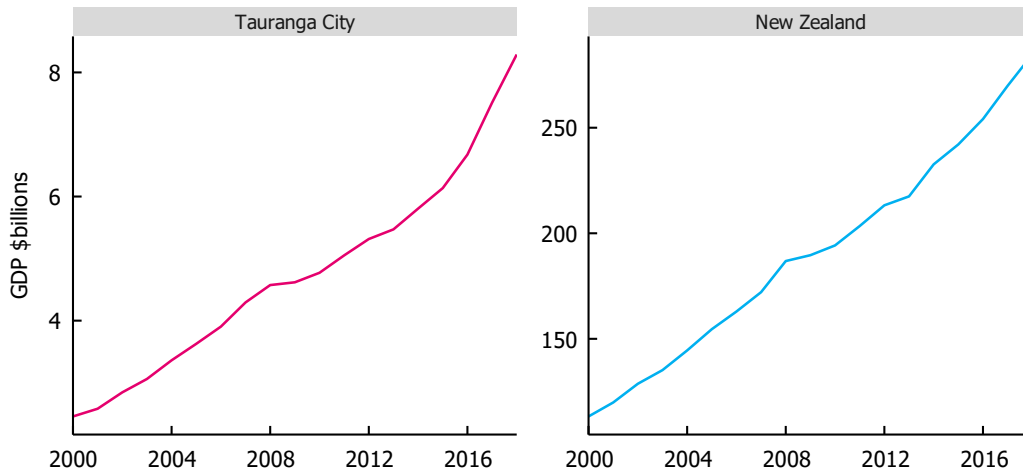
Source: NZIER, Stats NZ, REINZ

Stats NZ estimate that 82% of population growth over the 2013–2018 period in Tauranga has come from (domestic and international) net migration. Stats NZ estimate this proportion of growth will decline to 70% over the next five years.<sup>2</sup>

Tauranga’s economy has grown at a faster pace than the nationwide average in recent years.

<sup>2</sup> Stats NZ Population Projections 2013(base)-2043 update.

**Figure 3 Nominal GDP – Tauranga vs New Zealand**



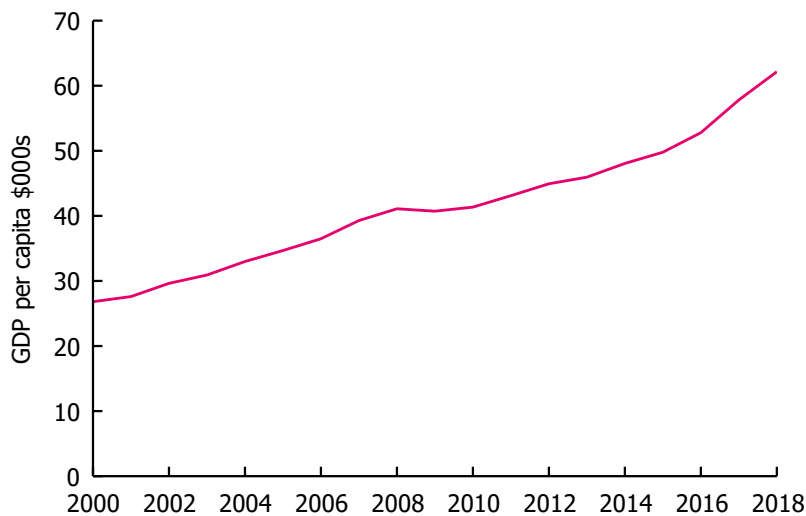
Source: NZIER, MBIE

## 2 Population growth and economic activity

The ability for housing supply in Tauranga to respond to growing demand will be an important influence on the future growth of the city. Acute housing shortages will see a further deterioration in housing and rental affordability and constrain population growth, which will also have flow-on effects on economic activity.

Population growth in Tauranga affects the city's GDP. Any limitation on its ability to accommodate new residents will affect the city's economic growth. Without development capacity the Tauranga housing market will be less equipped to respond to high demand by increasing new housing supply.

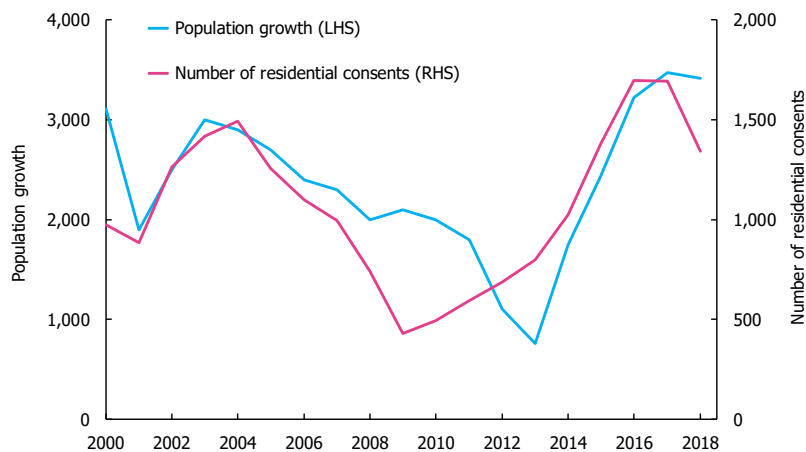
**Figure 4 GDP per capita has been growing in Tauranga**



Source: NZIER, MBIE, RBNZ

For example, population growth and residential consent issuance in Tauranga have generally moved in line with one another, as consent issuances signal development intentions in the market. Additional housing or alterations to the existing housing supply enable more people to reside in Tauranga. Although population growth leads to increased housing demand, which in turn encourages residential construction, constraints including labour shortages and availability of land may hamper the degree to which residential construction can respond. The housing shortage which results will likely hamper further population growth, leading to foregone opportunities.

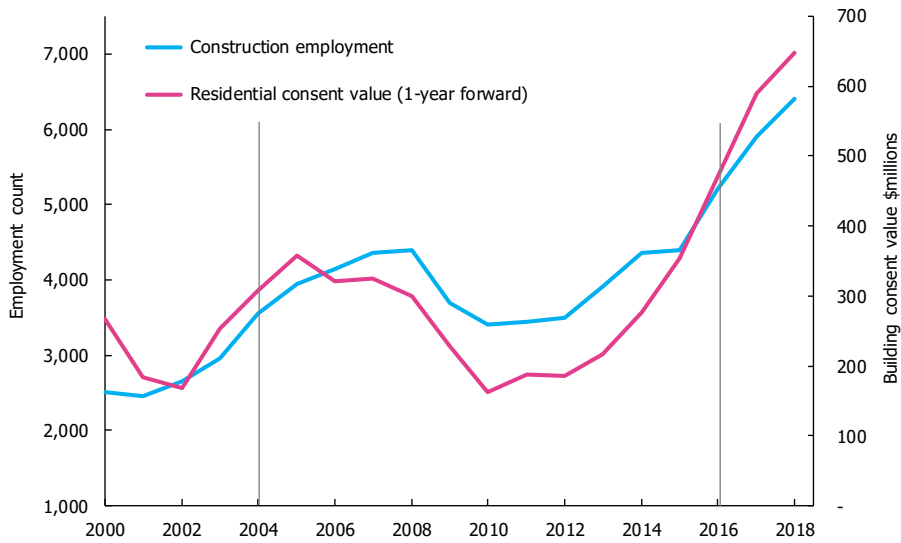
**Figure 5 New residential consents moves with population growth**



Source: Stats NZ

Development intentions are followed by additional construction labour to build the new dwellings. Construction employment has tended to follow residential consent issuance with a lag of around one year (Figure 6). A shortage of housing has the potential to limit the degree to which residential consent issuances can increase, which in turn will likely have flow-on effects on construction employment.

**Figure 6 Construction employment follows development intentions**



Source: Stats NZ

### 3 Past instances of a constrained housing market in Tauranga

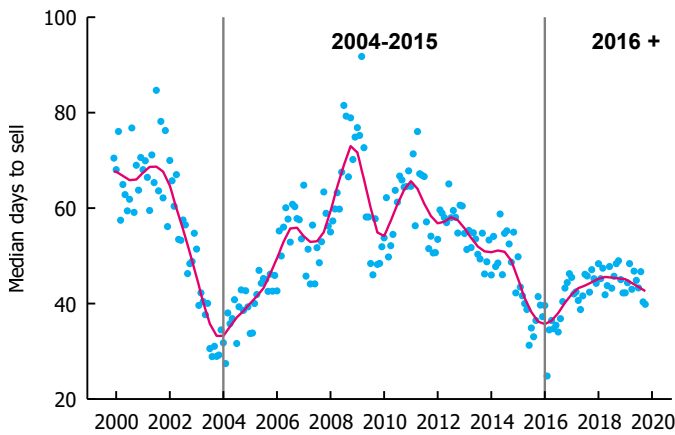
---

The median days it takes to sell a house provides an indicator of the degree of tightness in the housing market – a low number of days taken to sell a house suggests demand is high relative to housing supply.

Figure 7 looks at median days to sell for Tauranga. The blue points show actual median days to sell, while the pink line show the trend over this period. These observations provide an indicator of the periods when Tauranga had very high demand for residential property, which we can then compare with other movements in the residential market. The years 2004 and 2016 are of interest as they are when median days to sell were at their lowest – indicating periods of very tight supply in the Tauranga housing market.



**Figure 7 Low median days to sell show periods of Tauranga housing market tightness**

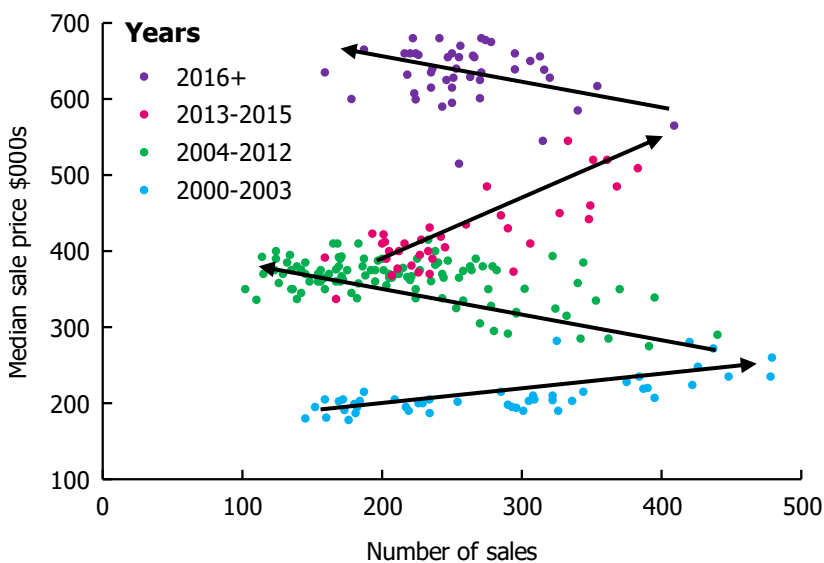


Source: NZIER, REINZ

Taking the experience of 2004, which saw a period of high house sales and prices, we see that increasing house prices is met with a combination of 1) decreasing sales as households are no longer willing to pay the higher prices, and 2) new housing supply from residential construction.

We see the same transition and adjustment occurring over the period of 2013–2015 where high demand pushes house prices upwards until the market re-adjusts. When housing demand is greater than supply, house prices increase, which eventually encourages residential construction as much as capacity constraints allow. We would expect similar outcomes in Tauranga if land capacity is constrained. These two periods of transition illustrate the dynamics of the Tauranga housing market, and the extent to which Tauranga house prices increased in periods of very acute housing shortages.

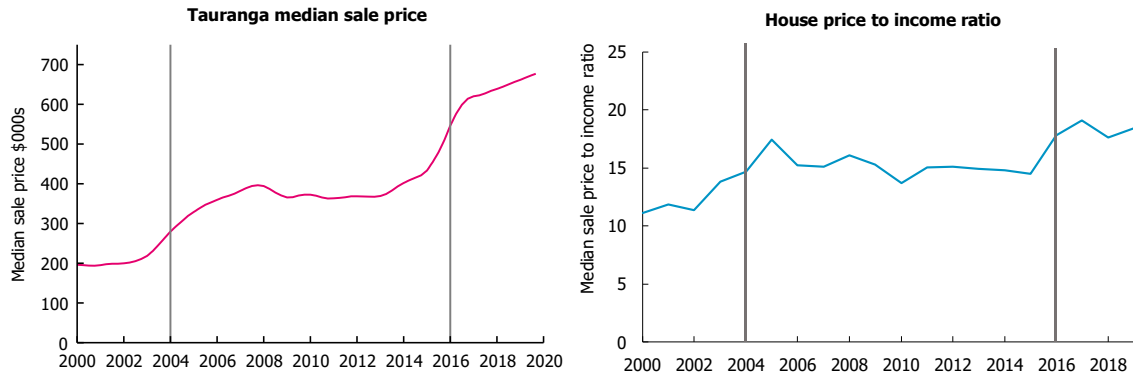
**Figure 8 High housing demand relative to supply drives house prices upwards**



Source: NZIER, REINZ

House prices in Tauranga have surged since 2014, but the increase has not been matched by growth in income. 2004 and 2016 are periods when the Tauranga housing market was particularly tight.

**Figure 9 Seasonally adjusted house prices and price to income ratios**

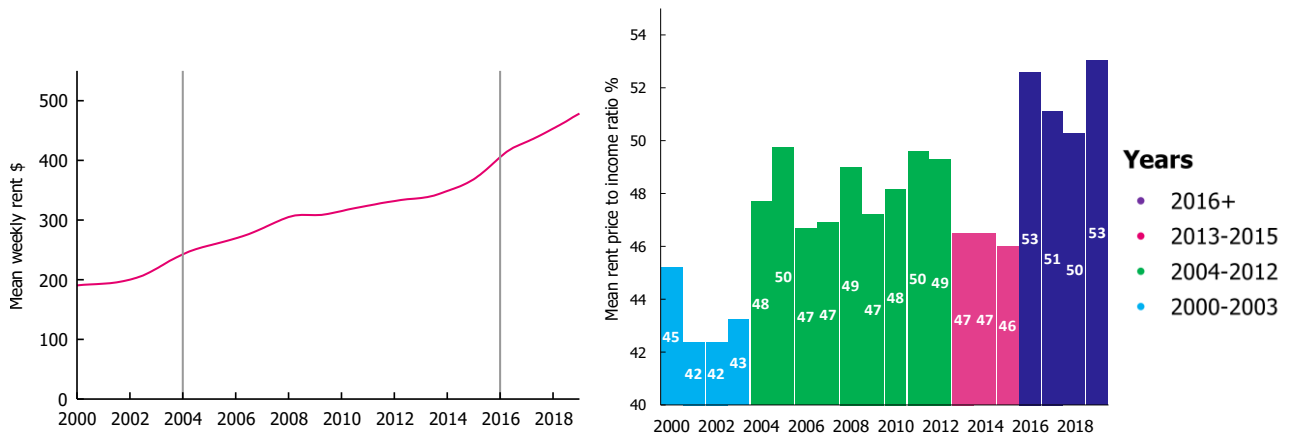


1. Price to-income ratio measures relate to Bay of Plenty.

Source: NZIER, REINZ, Stats NZ

Similarly, tight housing supply has pushed up rents in Tauranga, with rental inflation also outstripping income growth. Since 2016, mean rent has been over half of median income in the Bay of Plenty region. The deterioration in both housing and rental affordability in Tauranga as a result of housing supply constraints has implications for growth in the city, given it discourages people from living in Tauranga.

**Figure 10 Rents and rent to income ratios**



1. Price to-income ratio measures relate to Bay of Plenty.

Source: NZIER, MBIE, Stats NZ

## 4 Estimating the effects of a housing shortage in Tauranga

---

The residential housing market is comprised of interrelated markets for sales and rentals, each with their own geographic and price-band sub-markets that react to each another.

*Outcomes are determined by conditions in – and interactions between – a number of individual markets: the market to rent a house, the market to own a house, and the market to build a house (which is, in turn, affected by the market for land).<sup>3</sup>*

Veros Property Services estimated a shortage of 910 dwellings over the short-term (1 to 3 years) and 4,843 dwellings over the medium-term (maximum of 10 years). We estimate what this housing shortage means for the Tauranga economy (further detail on our methodology can be found in Appendix A).

Subsequent to the publication of Veros Property Services estimates, TCC have revised their population and dwelling projections following the 2018 Census results. The latest Census showed that actual population growth in Tauranga had been lower than that previously projected by Statistics New Zealand. The modified dwelling projections from TCC decrease the number of dwellings required over the short-term by 310, and by 1,343 dwellings over the medium-term. This sets the new requirements for TCC at 3,680 dwellings required over the short-term and 7,967 dwellings required over the medium-term.

We interpolate the years in between the time periods in the scenarios provided by Veros Property Services and TCC, to an annual basis assuming that the change in dwelling shortage will be constant year on year. We then adopt the current Tauranga City person per dwelling ratio of 2.41 to estimate the population foregone due to the shortage. This is used later in our analysis to capture the cumulative effect of the dwelling shortage, i.e. population in Year 1 will contribute to GDP over multiple periods.

We have therefore undertaken two sets of calculations of the effect of a housing shortage on population: one using Veros Property Services' estimates and one using TCC's revised figures. Our population estimates for the Veros Property Services' scenario and TCC's revisions are shown in Table 2.

<sup>3</sup> RBNZ Analytical Note 2013/11 *A closer look at some of the supply and demand factors influencing residential property markets*  
<https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Analytical%20notes/2013/an2013-11.pdf>

**Table 2 Population foregone due to a housing shortage**

Years with shortage	Veros estimates	TCC estimates
Year 1	731	482
Year 2	1,462	964
Year 3	2,193	1,446
Year 4	3,548	2,445
Year 5	4,902	3,443
Year 6	6,256	4,442
Year 7	7,611	5,441
Year 8	8,965	6,439
Year 9	10,319	7,438
<b>Year 10</b>	<b>11,673</b>	<b>8,436</b>

Source: NZIER

#### 4.1 Estimated effect on GDP

Conservatively, holding GDP per capita constant, over the short-term (i.e.1–3 years) we estimate this constraint on growth will lead to foregone GDP of \$272.7 million over the short-term period of three years. Over the medium-term, this will lead to foregone GDP of \$725.5 million per annum in ten years' time, for a cumulative impact of \$3.584 billion of GDP over the ten years.

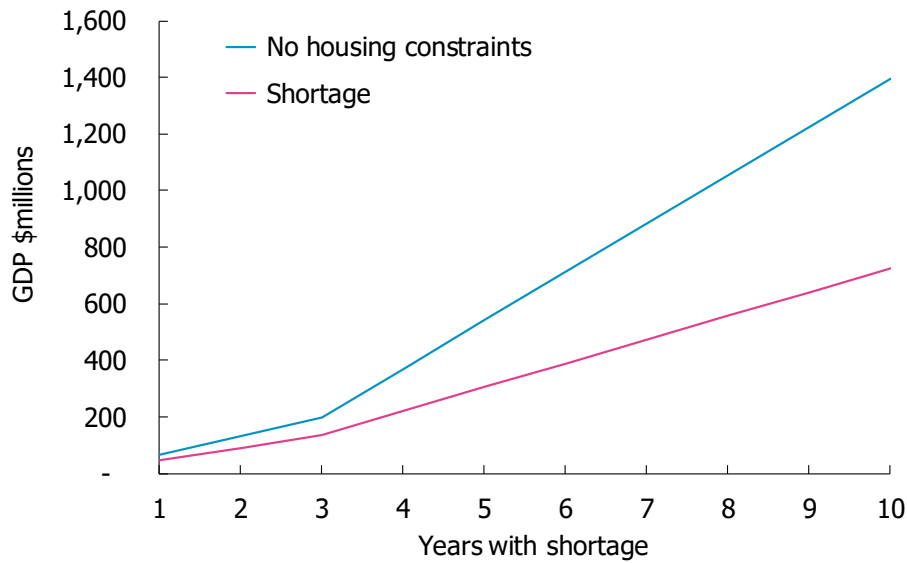
**Table 3 Impact of a housing shortage on GDP – original scenario**

Years with shortage	Cumulative population foregone	Cumulative GDP foregone \$m	% Tauranga City GDP foregone per annum <sup>4</sup>
Year 1	731	\$45	0.5%
Year 2	1,462	\$136	1.1%
Year 3	2,193	\$273	1.7%
Year 4	3,548	\$493	2.7%
Year 5	4,902	\$798	3.7%
Year 6	6,256	\$1,187	4.7%
Year 7	7,611	\$1,660	5.7%
Year 8	8,965	\$2,217	6.7%
Year 9	10,319	\$2,858	7.7%
<b>Year 10</b>	<b>11,673</b>	<b>\$3,584</b>	<b>8.8%</b>

Source: NZIER

<sup>4</sup> Year ended March 2018, MBIE territorial authority GDP estimates - <https://www.mbie.govt.nz/business-and-employment/economic-development/regional-economic-development/modelled-territorial-authority-gross-domestic-product/2019-release/>

**Figure 11 Estimated impact of a housing shortage on GDP – original scenario**



Source: NZIER

Adopting the revised dwelling projections from TCC results in a smaller impact from the housing shortage.

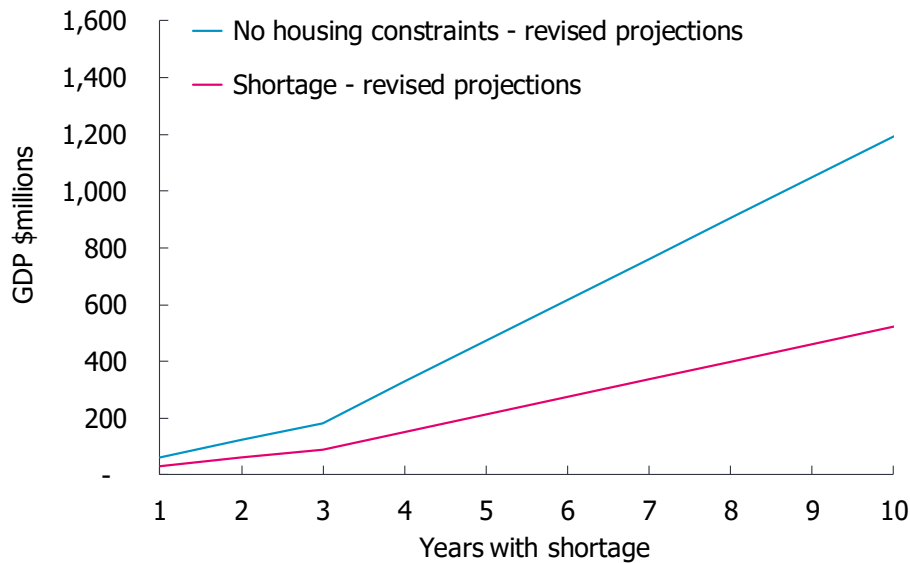
**Table 4 Impact of a housing shortage on GDP – revised projections**

Time period	Cumulative population foregone	Cumulative GDP foregone \$m	% Tauranga City GDP foregone pa <sup>5</sup>
Year 1	482	\$30	0.4%
Year 2	964	\$90	0.7%
Year 3	1,446	\$180	1.1%
Year 4	2,445	\$332	1.8%
Year 5	3,443	\$546	2.6%
Year 6	4,442	\$822	3.3%
Year 7	5,441	\$1,160	4.1%
Year 8	6,439	\$1,560	4.8%
Year 9	7,438	\$2,023	5.6%
<b>Year 10</b>	<b>8,436</b>	<b>\$2,547</b>	<b>6.3%</b>

Source: NZIER

<sup>5</sup> See Footnote 4

**Figure 12 Estimated impact of a housing shortage on GDP – revised projections**



Source: NZIER

## 4.2 Effect on the construction sector

We estimate the short-term housing shortage means construction employment is lower by 300–435 workers, relative to an unconstrained market (on the assumption that labour productivity remains constant). Meanwhile, the medium-term shortage means construction employment is lower by 1,580–2,320 workers. These figures represent the number of jobs in residential construction which do not exist because growth is constrained, compared with the counterfactual scenario where residential construction was able to grow to fulfil the shortage.<sup>6</sup>

In terms of the impact on the construction industry, we estimate this will be a cumulative \$31–\$45 million over the short-term, in terms of GDP production. Over the medium-term, we estimate this will be a cumulative \$164–\$240 million.<sup>7</sup>

Under the revised TCC projections we estimate that the short-term housing shortage would mean construction employment is lower by 195–290 workers relative to an unconstrained market. Meanwhile, the medium-term means construction employment is lower by 1,140–1,680 workers.

In terms of the impact on the construction industry, the impact given the new projections will be a cumulative \$20–\$30 million over the short-term, in terms of GDP production. Over the medium-term, we estimate this will be a cumulative \$118–\$174 million.

<sup>6</sup> These figures only relate to residential construction, given they are based on the housing shortage estimated by Veros Property Services. To estimate a jobs 'foregone' for total construction would require more information (e.g. what is the true infrastructure gap in Tauranga).

<sup>7</sup> We assume construction labour productivity, as proxied by the labour to GDP ratio, is held constant.

### 4.3 Effect on house prices and rents

Previous periods of housing market tightness, as discussed in Section 3, suggest that the short-term housing shortage would see Tauranga house prices increase by around \$60,850 per annum. Over the medium-term, we estimate the housing market shortage would see median Tauranga house prices increase by \$971,481.<sup>8</sup>

The revised projections portray a housing market that is not as tight as in the original scenario given less demand. We estimate the housing market shortage based on TCC new projections would see median Tauranga house prices increase by \$702,082, at a rate of \$40,119 per annum over the short-term.

These house price increases are significant, and a comparison with Auckland – a region which has faced severe housing shortages – shows that this is unlikely to persist over the long-term period of 10 years. The Auckland experience shows that house prices plateau after a surge in prices as the housing market bumps up against affordability constraints, with 1) new housing supply coming on board through residential construction, and 2) easing demand as people move to more affordable regions. Past experiences of acute tightness in the Tauranga housing market also show strong growth in house prices is typically followed by a ramp-up in housing construction.

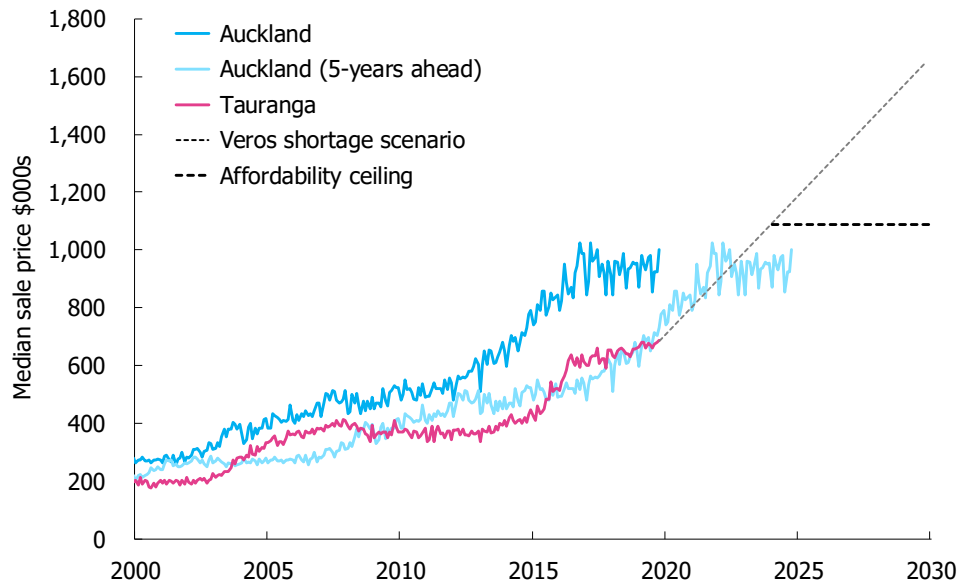
Hence the dotted line of the Veros shortage scenario in Figure 12 represents an extreme view of what Tauranga house prices would likely do should there be no supply (through residential construction) and demand (through an easing in the number of people moving to Tauranga) response. This estimate represents what is likely to happen to house prices should the housing shortage be allowed to grow to the extent estimated by Veros over the ten-year period, where supply remains constrained while the Tauranga population continues to increase.

Past instances of acute tightness in the Tauranga and Auckland housing markets suggest such strong house price growth under housing shortage conditions can only last for around 4-5 years (2004-2008 for Tauranga, 2012-2017 for Auckland). Although there is much uncertainty over when we would hit the next affordability ceiling for the Tauranga housing market, by our estimates in year 5 of the housing shortage the median Tauranga house price would be around \$1,087,953 under the original scenario. At around this point, affordability constraints would likely see either a supply and/or demand response.

Based on the revised scenario, by year 5 we estimate that the median Tauranga house price would be around \$966,564.

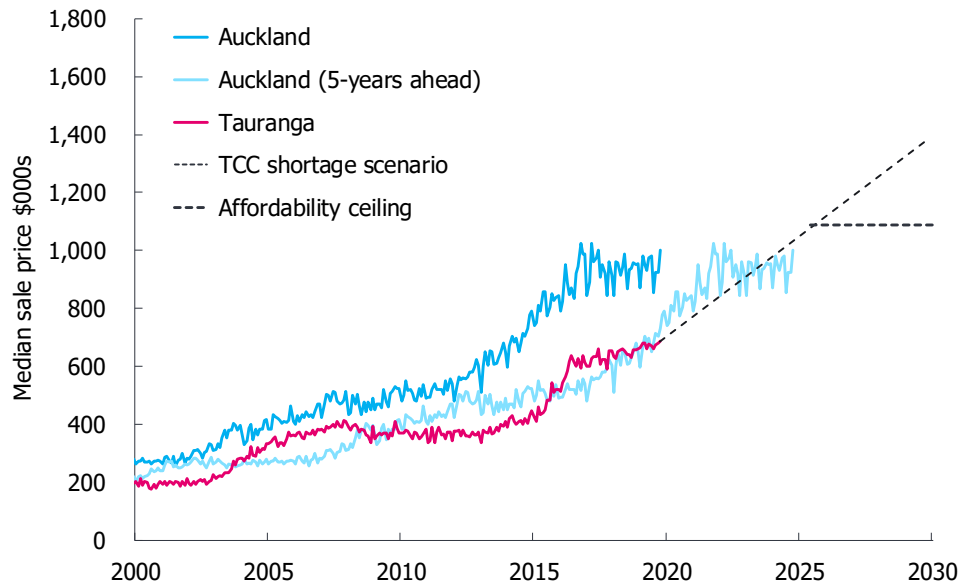
<sup>8</sup> We apply the house price elasticities we estimated based on the previous periods of acute housing market tightness we identified.

**Figure 13 Estimated effect on Tauranga house prices – original scenario**



Source: NZIER, REINZ

**Figure 14 Estimated effect on Tauranga house prices – revised projections**



Source: NZIER, REINZ



In considering what house price inflation would be under 'normal' circumstances, house prices tend to be stable when new housing supply increases in response to increased demand. The Reserve Bank in the past has indicated a rough rule of thumb for house price inflation of around 2 percent – the mid-point of its inflation target band.

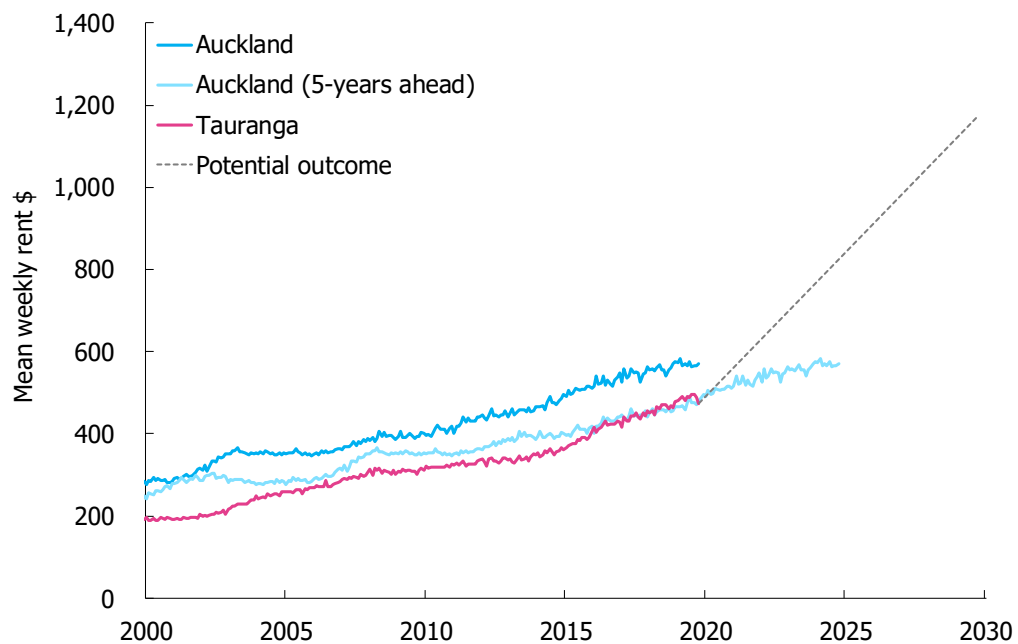
Should residential construction be constrained and unable to meet the increased housing demand, then significant increases in Tauranga house prices over the coming years are likely.

Similarly, constraints on housing demand will also put further upward pressure on Tauranga rents. Based on those same periods of housing market tightness and extent of housing constraints we highlighted in Section 3, on the assumption that rental yields remain constant we estimate that mean rents increase by \$692 over ten years for the original Vero Property housing shortage scenario.

Again, this represents an extreme view of how high rents will go, and historically rents have been more tied to income than house prices. This means we are likely to see landlords accept a lower yield in expectation of capital gains in the future, with past Auckland experience providing a better guide as to how high Tauranga rents could go given affordability constraints.

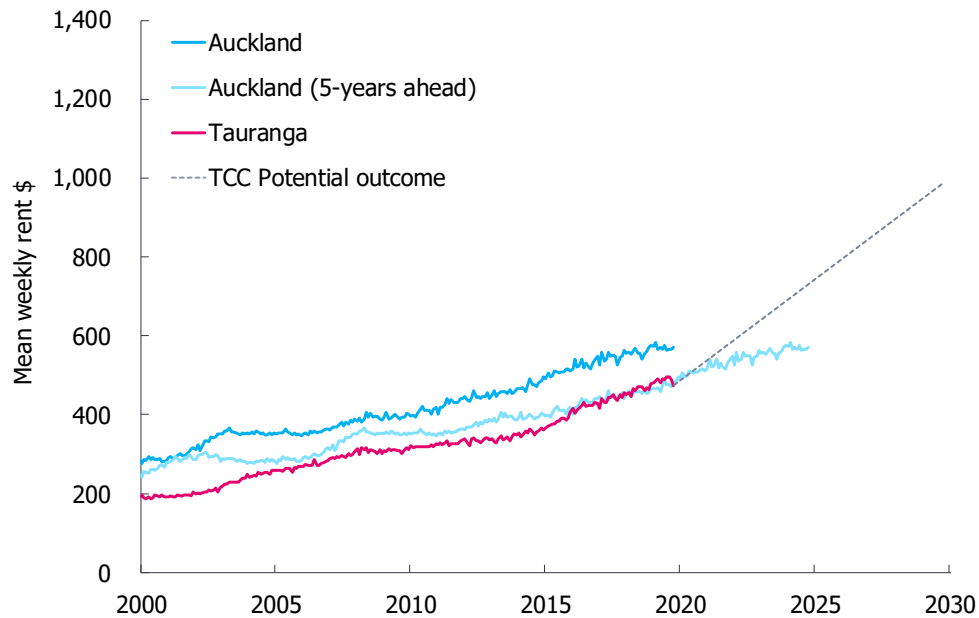
With a smaller dwelling shortage now projected by TCC, we estimate that residential house prices will increase at a slower rate than in our original scenario. Subsequently to match the current rental yield, rent prices would also increase at a slower rate. On the assumption that rental yields remain constant we estimate that mean rents increase by \$500 over ten years.

**Figure 15 Estimated effect on rents – original scenario**



Source: NZIER, MBIE

Figure 16 Estimated effect on rents – revised projections



Source: NZIER, MBIE

## 5 Conclusion

---

Housing shortages impede growth as it means less people can live in a region. To the extent economic growth is largely driven by increased population, housing supply constraints can have widespread effects on the economy. The main channels we see these effects coming through are in the deterioration in housing and rental affordability for Tauranga residents, and the economic activity foregone as a result of people that are unable to live in Tauranga.

Time and resource constraints mean we have only considered how the economic variables have performed during times of acute tightness in the Tauranga housing market, without assessing causality. We suggest further investigation into how the different variables interact and other potential influences on economic activity during periods of housing market tightness. Disaggregating the impacts from different influences such as, pricing, construction costs and plan-based effects would provide greater insight into how to minimise the incidences of housing shortages in Tauranga.

## 6 References

---

- Tauranga City Council. "Urban Form and Transport Development Committee Meeting," 2019. [http://econtent.tauranga.govt.nz/data/bigfiles/committee\\_meetings/2019/june/agen\\_uftdc\\_11jun2019.pdf](http://econtent.tauranga.govt.nz/data/bigfiles/committee_meetings/2019/june/agen_uftdc_11jun2019.pdf).
- Watson, Elizabeth. "A Closer Look at Some of the Supply and Demand Factors Influencing Residential Property Markets," 2013. <https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Analytical%20notes/2013/an2013-11.pdf>

## Appendix A Methodology

---

### A.1 Estimating GDP foregone

We have estimated the change in GDP foregone based on the amount of population foregone as a result of a housing shortage in Tauranga.

We have adopted the number of dwellings that Tauranga reported by Veros Property Services and estimated the resulting population using the 2018 person per dwelling ratio for Tauranga. This accounts for the persistence of empty dwellings such as those for sale on the market.<sup>9</sup>

Applying these ratios to the short-term (1–3 years) and medium-term (4–10 years) shortages reported by Veros Property Services, we estimate that the cumulative population foregone will be 11,673. We have assumed that the population growth foregone will be distributed equally across the 3 and 10-year periods, reflecting the dwelling shortages determined over the short- and medium-terms.

Current GDP per capita has been applied to population foregone for each year and summed to determine aggregate loss in GDP.<sup>10,11</sup> This assumes that Tauranga would have grown at the rate forecasted by Stats NZ if it had capacity to do so.

### A.2 Estimating construction employment and resulting GDP foregone

The foregone construction employment has been based on dwelling shortages reported by Veros Property Services. We have estimated residential building productivity rates using construction employees to residential building consent at periods where productivity was at their highest.

We have not assumed when construction would occur or if an existing employee would undertake the construction process but rather how many employees are needed per annum for each residential build.

<sup>9</sup> We acknowledge that population per dwelling ratios have been decreasing in Tauranga in recent years, however full capacity would be an unrealistic scenario.

<sup>10</sup> While GDP per capita has been growing at a fairly consistent rate over the last 18 years, it would be unreasonable to assume how this would track in the future without more in-depth analysis. On this basis our estimates are conservative.

<sup>11</sup> Any changes in the assumption as to when population growth would have occurred in Tauranga will also change our estimates of GDP foregone.

Construction GDP per employee for 2017 (inflation adjusted to current prices) and the 2017 ratio of construction employees in Tauranga was applied to the foregone construction employees to determine the loss in GDP within the construction industry due to a housing shortage.

Our figures represent the number of employees and GDP required for the number of dwellings that would be built in an unconstrained market.

### **A.3 Housing and weekly rent prices**

We map the historic relationship of median sale prices to the number of sales against median days to sale to determine the periods of where demand surpassed supply. The periods where median days to sell was historically low, we observe a high number of sales before a price adjustment occurs.

We found that the proportional change in price vs sales across the two observed periods where median days to sell was lowest and price adjustment occurred are almost identical.

We have used these periods of price adjustment to determine the potential prices given a future housing shortage. We have applied the same proportional price change to current prices and dwelling shortage estimates to determine future prices.

We have assumed that the rental yield will be the same as the current rate and applied this to our estimated prices to determine the change in rental prices given the estimated housing shortage.