National Construction Pipeline Report 2020

A Forecast of Building and Construction Activity

8th Edition

BP 6156

MINISTRY OF BUSINESS, INNOVATION & EMPLOYMENT
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The National Construction Pipeline Report 2020 (the report) was commissioned by the Ministry of Business, Innovation and Employment (MBIE) and jointly prepared by BRANZ and Pacifecon (NZ) Ltd (Pacifecon).

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Contents

Figures and tables

1. Introduction

1.1 Overview

The National Construction Pipeline Report 2020 (the report) was commissioned by the Ministry of Business, Innovation and Employment (MBIE) and jointly prepared by BRANZ and Pacifecon (NZ) Ltd (Pacifecon). The report projects building activity for the next six years, ending 31 December 2025. It includes national and regional[1] breakdowns of actual and forecast residential building, non-residential building and infrastructure activity. The report is based on residential and non-residential building and construction forecasts from BRANZ and data on researched non-residential building and infrastructure intentions from Pacifecon.[2] Pacifecon provides no residential data to the report.

An important aspect of this report is the significant uncertainty presented by the COVID-19 pandemic. The analysis presented within this report is our best effort at estimating the likely impact of the pandemic on construction activity moving forward. However, a lot of uncertainty remains throughout the sector, and the ramifications of the pandemic are likely to be felt for several years. The severity of the pandemic on construction activity is likely to be impacted by several factors that sit outside of the current modelling. There may also be interventions to try and tackle the impact of the pandemic that have yet to be implemented or have not yet been considered.

1.2 Purpose and content

The report aims to provide awareness of the expected pipeline of building and construction work to support:

- planning by all participants in the sector
- scheduling of investment in skills and capital to meet the future needs of the sector
- coordination of construction procurement (particularly central and local government) to enable improved scheduling of construction projects.

Improvements in these areas could help moderate the boom-bust cycles that have negatively impacted productivity, innovation, employment, skill levels and quality in the construction sector.

In this report, building and construction is split into three activity types:

- Residential building: detached and multi-unit dwellings.
- Non-residential building: structures of a building type (vertical) other than residential, including hotels, offices, retail outlets and industrial buildings.
- Infrastructure: structures of a non-building type (horizontal), such as roads, subdivisions and civil works. Infrastructure projects do not typically require a building consent.

The report includes:

- a summary of the report's key findings
- national and regional forecasts of residential buildings, non-residential buildings and infrastructure activity
- a comparison of this year's forecasts against last year's
- appendices, including tables of forecast and research data.

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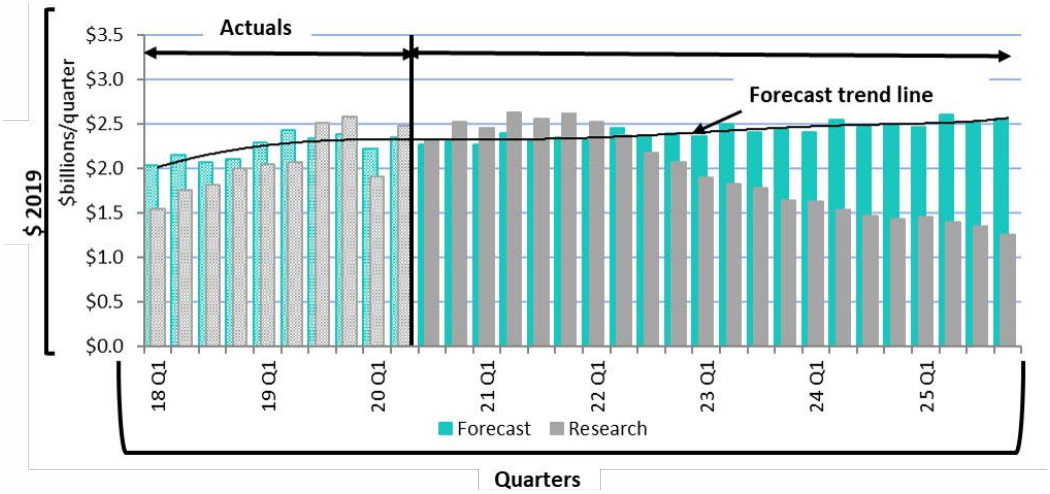
1 The regional areas reported are Auckland, Waikato/Bay of Plenty, Wellington, Canterbury, Otago and Rest of New Zealand (which includes all other regions not stated).

2 See section 8.3 for more information on forecast and research data.

1.3 Understanding the graphs and data

Different types of graphs are used in this report to illustrate relevant information. The key features of the graphs are discussed below using the following example.

Figure 1.3.1 Example graph



Source: BRANZ/Pacifecon

- Values are in constant December 2019 dollars and are expressed in $billions (b) per quarter or per year, unless otherwise stated. Inflation has been removed from all dollar values.
- Forecast refers to forecast data from BRANZ.
- Research refers to construction project intentions data provided by Pacifecon.
- Actuals are the actual values or activity from official statistics. The year beginning January 2019 is used as the base year for the actual data in the report. A vertical line on the graphs indicates the start of a forecast. Actuals are to the left of the vertical line and are generally shown in a faded colour shade.
- Years are calendar years – the 12 months beginning January. Where years are used, each point on the graph represents 31 December of that year – for example, 2019 represents January 2019 through to December 2019.
- Quarters refer to parts of the calendar year as follows:
  - Q1 = 1 January to 31 March.
  - Q2 = 1 April to 30 June.
  - Q3 = 1 July to 30 September.
  - Q4 = 1 October to 31 December.
- Where rolling years are used, each point on the graph represents the total of the 12 months immediately preceding that point – for example, 2020 Q2 represents July 2019 through to June 2020.

A glossary of key terms is presented in section 8.2.

2. Key findings

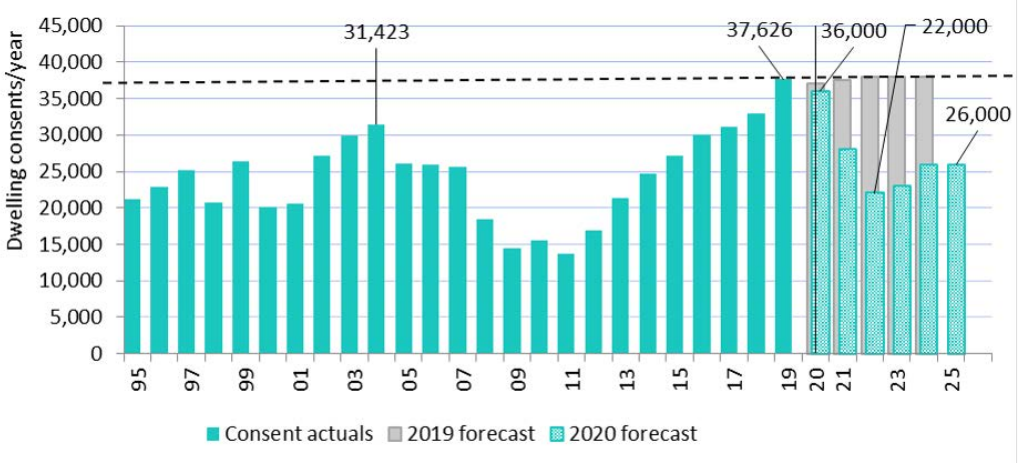
This section discusses the major findings in the report:

- Residential activity is likely to be hit hardest by the COVID-19 pandemic.
- Non-residential activity is forecast to have peaked.
- Infrastructure activity is forecast to continue trending upwards.
- Significant uncertainty surrounds the impact of the COVID-19 pandemic

2.1 Residential activity is likely to be hardest hit by the COVID-19 pandemic

Historically, residential activity is the most volatile to changing economic conditions. The recent building boom has largely been because of strong demand for new dwellings, which led to over 37,000 dwelling consents in 2019. However, as a result of the worsening economic conditions currently anticipated due to the COVID-19 pandemic, we forecast that new dwelling consents are likely to drop off from the current high to 22,000 dwellings in 2022. We are not forecasting new dwelling consents to drop to the same levels as were seen during the Global Financial Crisis, but there is still likely to be a significant drop-off in consenting numbers through to the end of 2022.

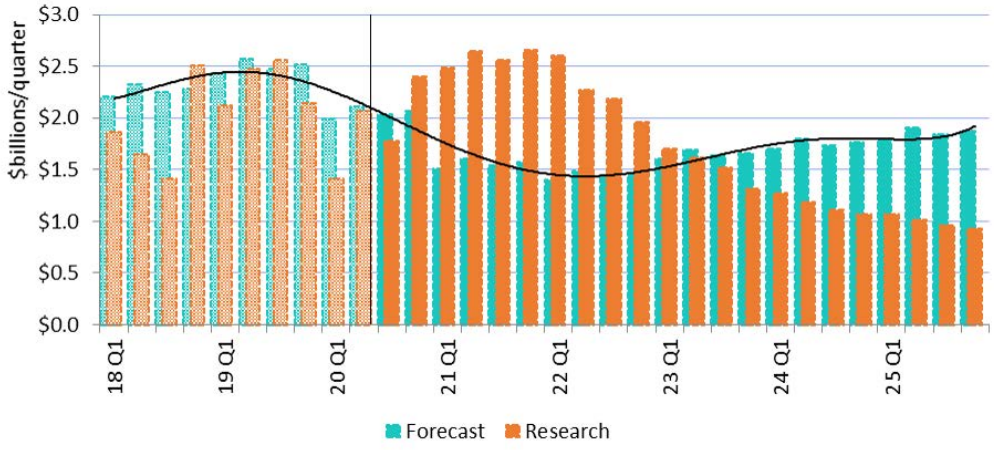
Figure 2.1.1 Dwelling units consented nationally



2.2 Non-residential activity is forecast to have peaked

The 2019 National Construction Pipeline Report forecast the peak in non-residential activity to occur in 2021. Due to the COVID-19 pandemic, we now forecast the peak to have occurred slightly earlier in 2019. We forecast a drop from $10b in 2019 to $5.8b in 2022 before recovering to $7.4b in 2025.

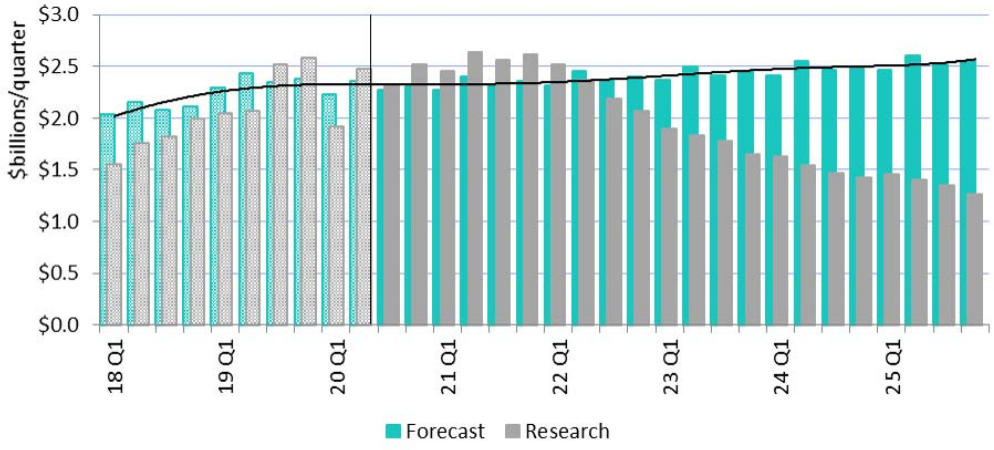
Figure 2.2.1 Non-residential building activity nationally



2.3 Infrastructure activity is forecast to continue trending upwards

The infrastructure sector is the only sector that we are forecasting to have an increase in activity over the next couple of years. Previously announced government spending in the sector as well as significant longer-term projects that are continuing or planned to start soon suggest strong activity throughout the forecast period.

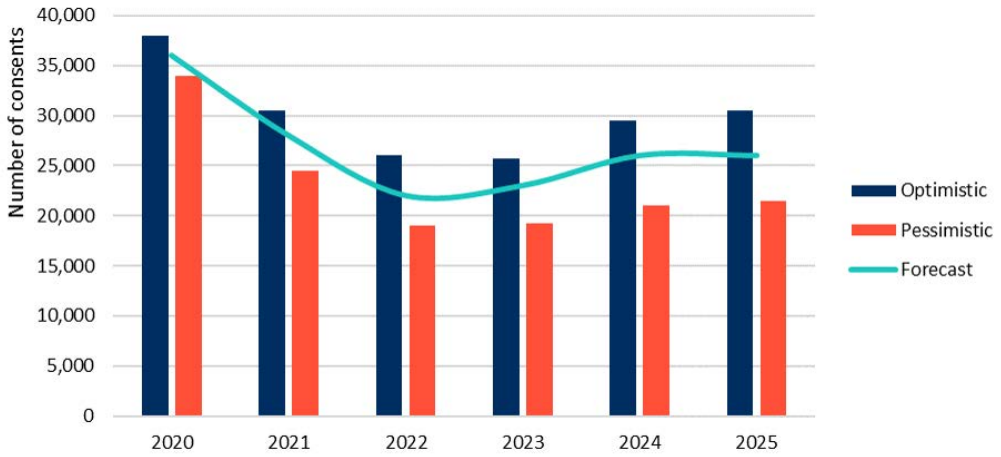
Figure 2.3.1 Infrastructure activity nationally



2.4 Significant uncertainty surrounds the impact of the COVID-19 pandemic

The forecast is currently surrounded by significant uncertainty. Not only is there uncertainty regarding how construction may be impacted by the COVID-19 pandemic, but also how our input variables into the modelling are likely to be impacted. The forecast relies on the accuracy of our input variables, and to illustrate how changes in the input variables may change the forecast, we present the figure below. It shows how our forecast of new dwelling consents would be impacted by an increase of 20,000 new migrants each year and a 1% improvement in economic growth each year (over current assumptions) in the optimistic scenario. The pessimistic scenario shows a decrease of 20,000 new migrants each year and a 1% decrease in economic growth (over current assumptions) each year.

Figure 2.4.1 New dwelling consents based on optimistic and pessimistic scenarios



3. National forecast

This section includes national forecasts for each activity type as well as:

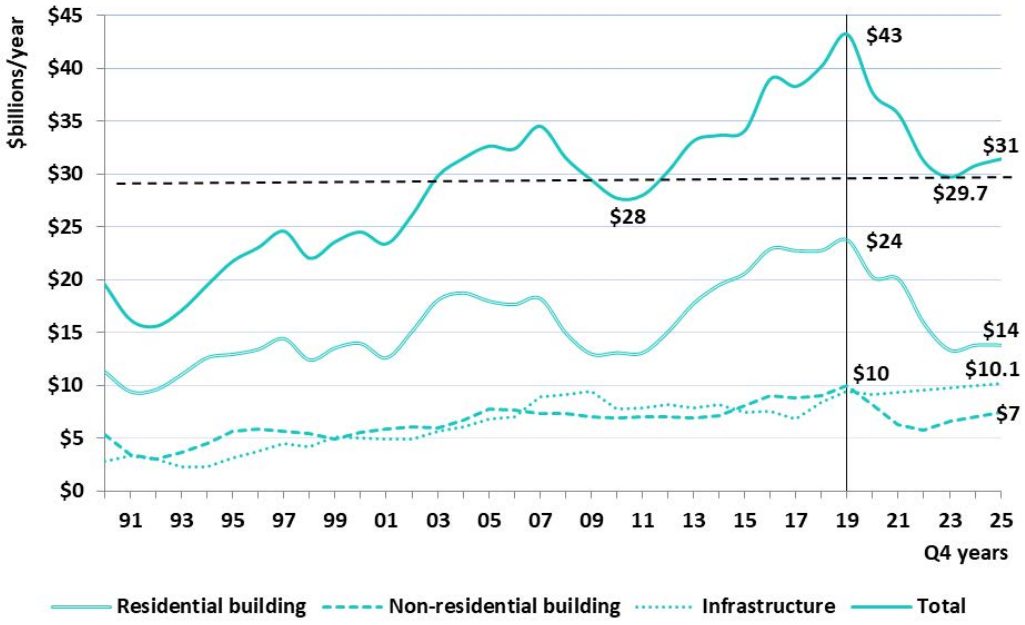
› a breakdown of non-residential building and infrastructure research data by type and initiator

› regional comparisons.

3.1 National construction, by value

New Zealand's total construction value increased by 7.5% in 2019 to $43.2b. This year's forecast is for a sharp drop-off in the value of construction to $29.7b in 2023. This reduction would bring the value of construction down to similar levels as following the Global Financial Crisis.

Figure 3.1.1 All construction nationally, by value

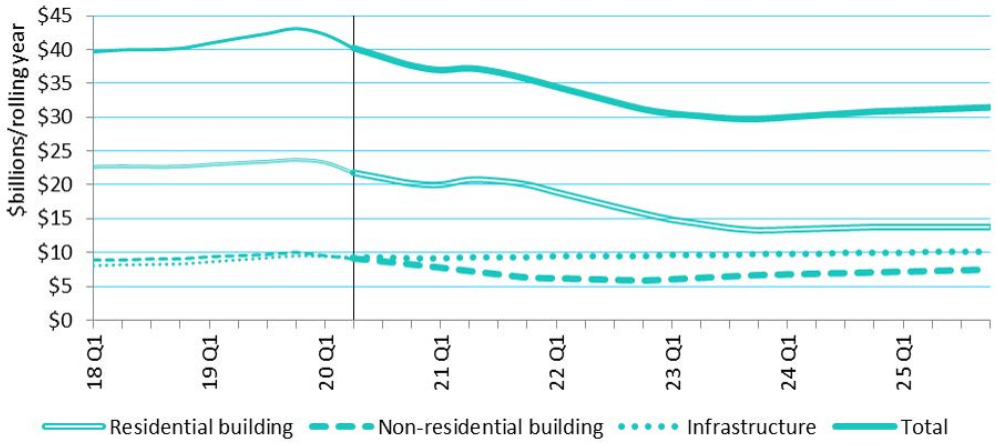


Source: BRANZ/Pacifecon/Stats NZ

3.2 National construction, by activity

Residential buildings are the largest contributor to national construction. Residential buildings contributed 55% of total construction value in 2019. The impact of the COVID-19 pandemic is seen most significantly in the residential sector, as the value of residential construction falls from $23.7b in 2019 to $13.4b in 2023. Last year, non-residential construction value was forecast to peak in 2021. We now anticipate the peak to have been reached and activity to drop by 42% between 2019 and 2022. Infrastructure activity is forecast to moderately increase throughout the forecast period to $10.1b in 2025.

Figure 3.2.1 All construction nationally, by activity

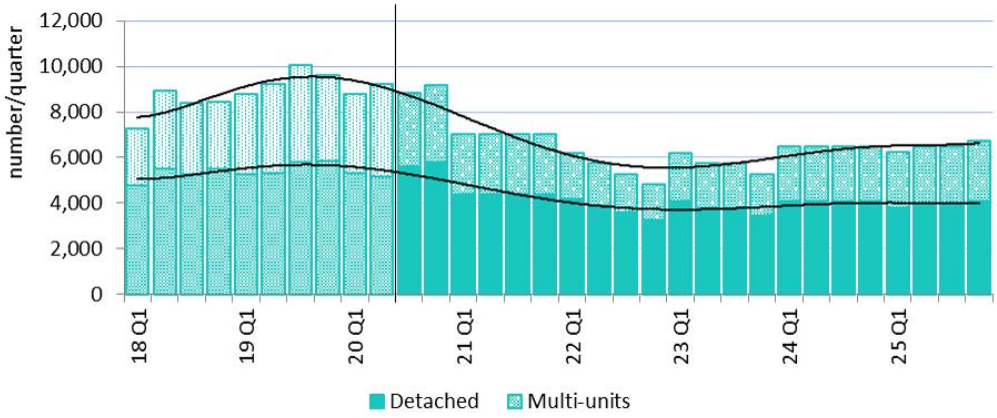


Source: BRANZ

3.3 National residential building, by dwelling number

Multi-unit dwellings accounted for 41% of all dwellings consented in 2019. We anticipate multi-unit dwellings to be hardest hit by the COVID-19 pandemic, particularly apartments, and have forecast multi-units to account for just 32% of all dwellings consented in 2022.The forecast is now for 161,000 new dwellings to be consented over the next six years, an average of about 26,800 per year. We have assumed that there is no further government intervention in the residential sector as a result of the COVID-19 pandemic.

Figure 3.3.1 Dwelling units consented nationally[3]

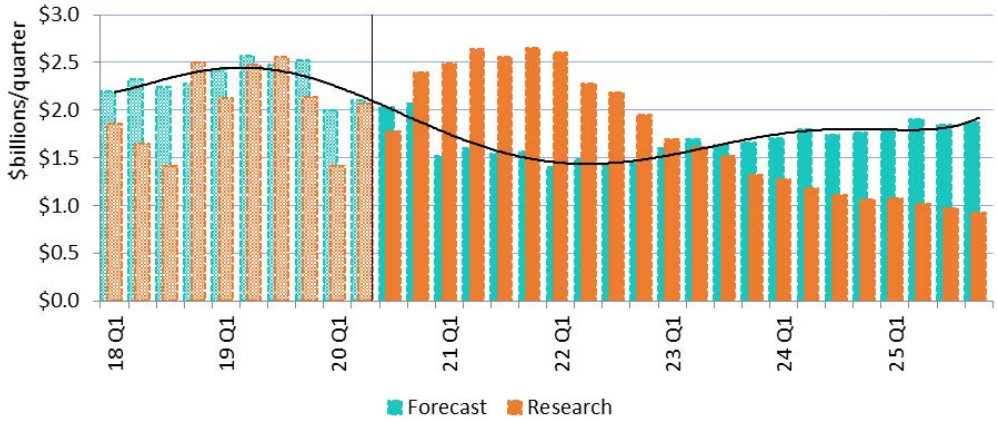


Source: BRANZ

3.4 National non-residential building

Non-residential building value nationally peaked in 2019 at $10b. This was two years earlier than previously forecast, largely as a result of the COVID-19 pandemic. We now anticipate non-residential activity to fall through to 2022 at $5.8b. The high value in Pacifecon's researched project data indicates strong national non-residential building project intentions. However, the effect of the COVID-19 pandemic on the economy more generally will result in many of these projects being pushed further into the future.

Figure 3.4.1 Non-residential building activity nationally



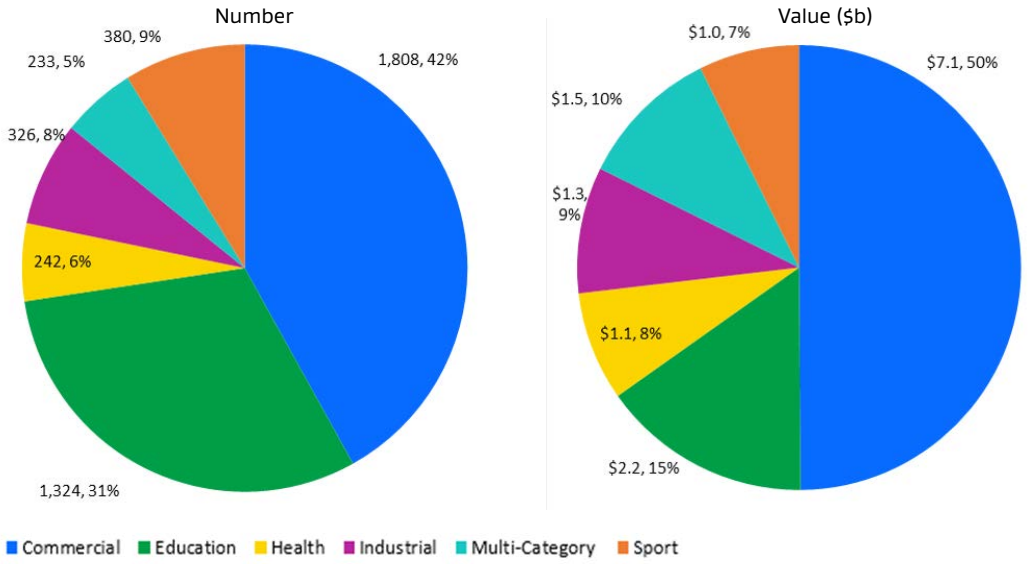
Source: BRANZ/Pacifecon

3 A table of annual total dwelling units, actual and forecast, is provided in section 8.6.

3.5 Types of non-residential building projects

Commercial buildings dominate non-residential building work expected to start in the year to December 2020, contributing 42% of the total number of projects and 50% of total value. This is a lower proportion by both number and value than we saw in the 2019 report due to many planned visitor accommodation and office building projects being delayed. Education has many projects (31% of the total number of projects) but only accounts for 15% of the total value.

Figure 3.5.1 Non-residential building types anticipated to year ending 2020,[4] by number and total project value



Source: Pacifecon

4 Actuals and construction intentions, year ending December 2020.

3.6 Project initiators for non-residential building, by sector

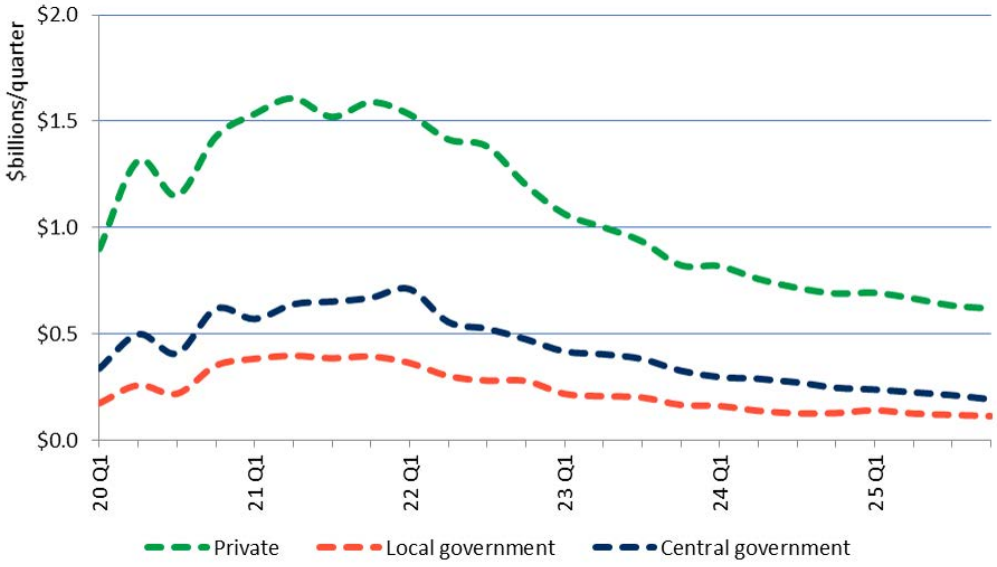
The private sector is the largest initiator of non-residential building, contributing 63% of the value of researched intentions over the forecast period, while central and local government make up 24% and 13% respectively. Compared to last year, central government has increased its overall share, while the private sector and local government have both decreased slightly. New non-residential building intentions for all sectors are forecast to peak through 2021.

Central and local government-initiated projects continue to benefit from having good long-term visibility of funding,[5] which means intentions tend to remain strong throughout the forecast period.

Private sector intentions are more heavily skewed towards the short term due to optimism bias[6] and more variable private funding, which can result in intentions falling away in the medium term as there is less certainty.

Pacifecon has found that, due to the COVID-19 pandemic, rather than seeing very many cancellations, projects have been put on hold or delayed, in some cases by several years. This has kept the overall pipeline high.

Figure 3.6.1 Non-residential building intentions, by project initiator and start date



Source: Pacifecon

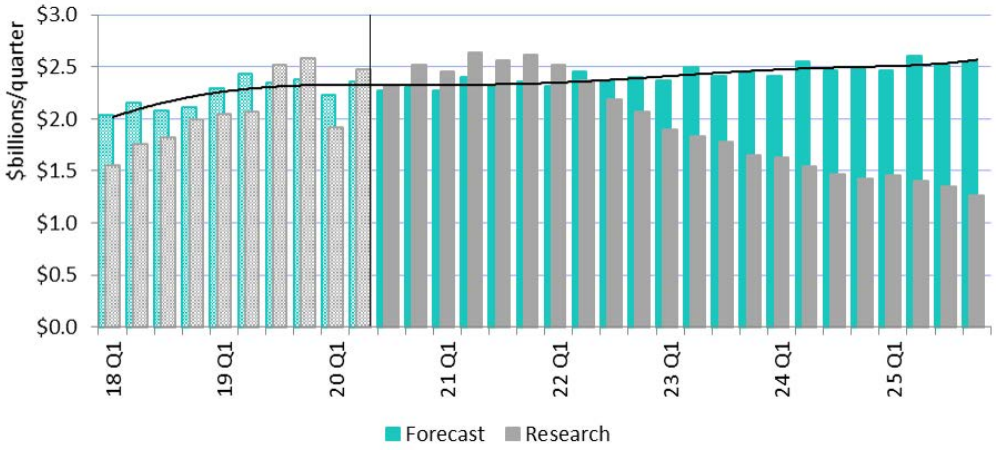
5 Local government long-term plans and central government budget statements.

6 See section 6.5 for more information on optimism bias.

3.7 National infrastructure activity

In 2019, infrastructure represented one-fifth of total building and construction value. The last year saw an increase in infrastructure activity of just over 13% from 2018 to $9.5b in 2019. This is expected to steadily increase year on year throughout the forecast period, reaching $10.1b by 2025. Pacifecon's research data indicates strong sector intentions to initiate new infrastructure projects nationally.

Figure 3.7.1 Infrastructure activity nationally

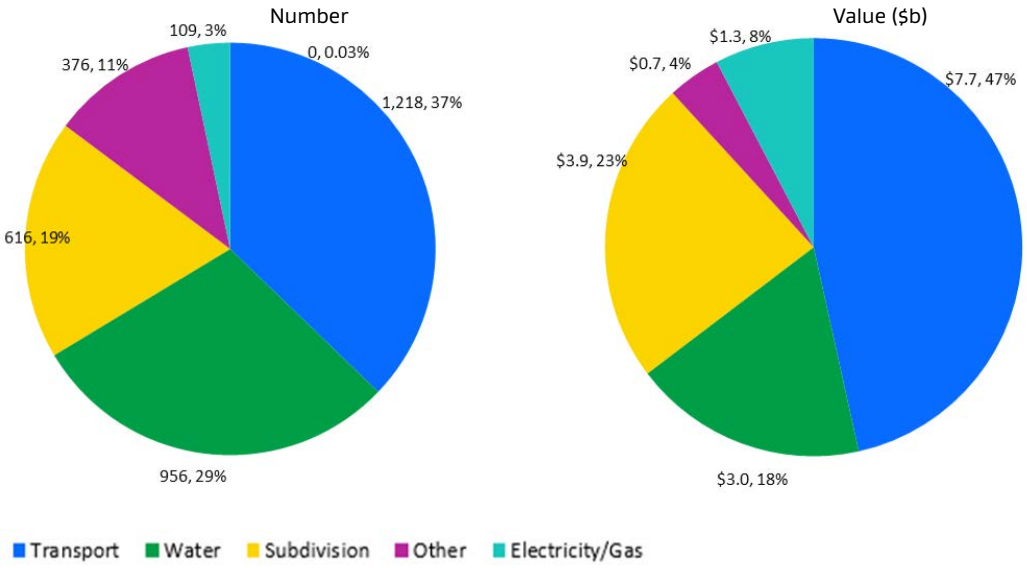


Source: BRANZ/Pacifecon

3.8 Types of infrastructure construction

Transport, water and subdivision projects will dominate new infrastructure activity in 2020, contributing 85% of the projects and 88% of the total value, very similar to the 2019 report. As with last year, transport intentions stand out, with high-value projects contributing a much higher proportion of value (47%) than the number of projects (37%).

Figure 3.8.1 Infrastructure project types anticipated to start in 2020,[7] by number and total project value[8]



Source: Pacifecon

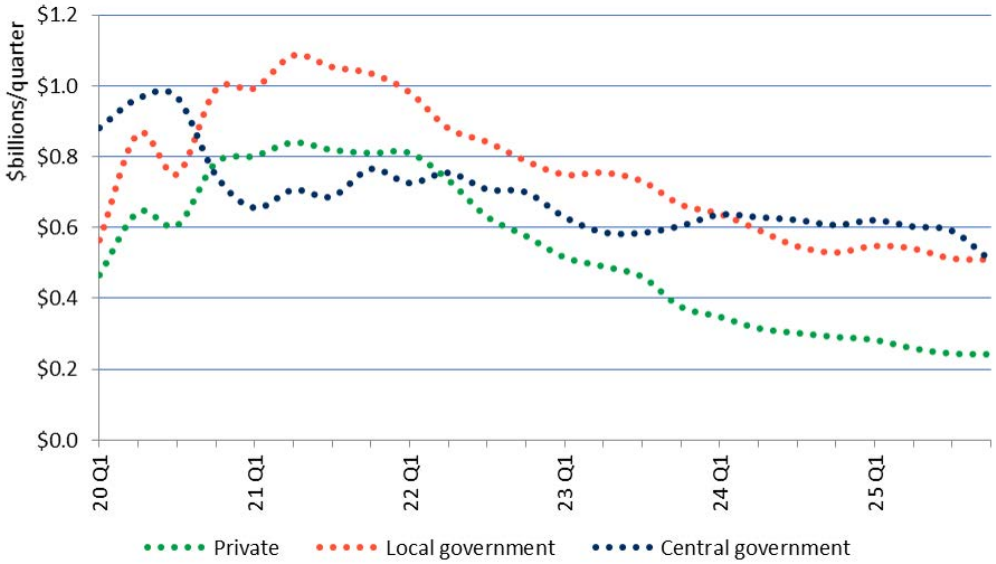
7 Actuals and construction intentions, year ending December 2020.

8 Other includes: communications, seismic upgrades, parks/recreation etc

3.9 Project initiators for infrastructure projects, by sector

As in previous reports, local government is the main initiator of infrastructure intentions, contributing 38% of projects initiated over the forecast period. This is a reduction (of 9%) on the 2019 report. Central government has increased (by 7%) to 35%, with mostly transport projects, as has the private sector (by 2%) to 27%, with mostly subdivisions. 2021 shows the peak for infrastructure intentions. Private sector-initiated subdivisions are dependent on other infrastructure developments such as transport, water and power, particularly for greenfield sites.

Figure 3.9.1 Infrastructure intentions by project initiator and start date



Source: Pacifecon

3.10 Regional comparisons

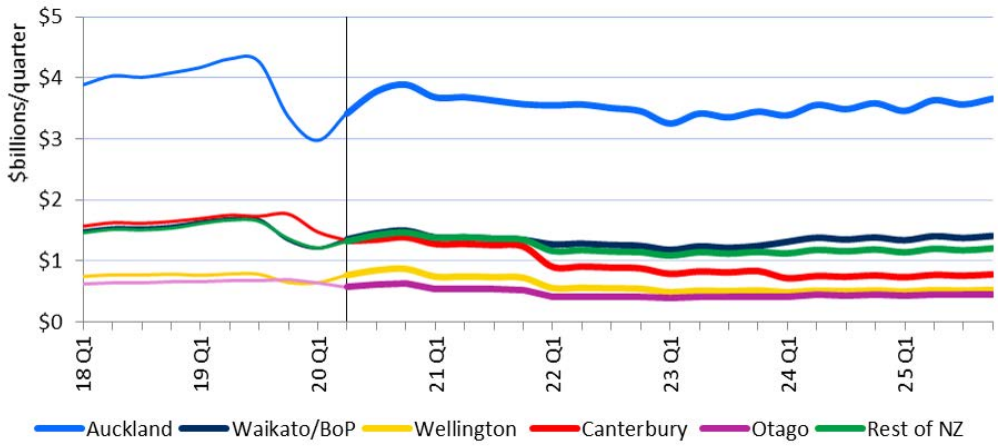
This section examines the differences in the forecast values for residential buildings, non-residential buildings and infrastructure activity across the regions defined in the report. The individual regions are discussed in more detail in section 4.

Total building and construction value regional comparison

All regions (including Canterbury, which saw a reduction of 9% in 2018) experienced growth in total construction in 2019. The Auckland region grew 7% to $17.1b on the previous year. Waikato/Bay of Plenty saw 9% growth to $6.7b, Canterbury 8% to $7.0b, Otago 8% to $2.7b and Rest of New Zealand saw the greatest increase at 10% to $6.6b.

Throughout the forecast period, all regions are now expected to see decreased levels of activity. The low for total construction nationally is forecast to be 2023, after which recovery is expected. Compared to 2019, Auckland is expected to see a reduction in activity of 16% to $14.3b by 2025. Waikato/Bay of Plenty is forecast to decrease by 18% to $5.5b, Wellington by 35% to $2b, Canterbury by 57% to $3.0b, Otago by 33% to $1.8b and Rest of New Zealand by 29% to $4.7b over the six years to 2025.

Figure 3.10.1 Value of total building and construction, by region



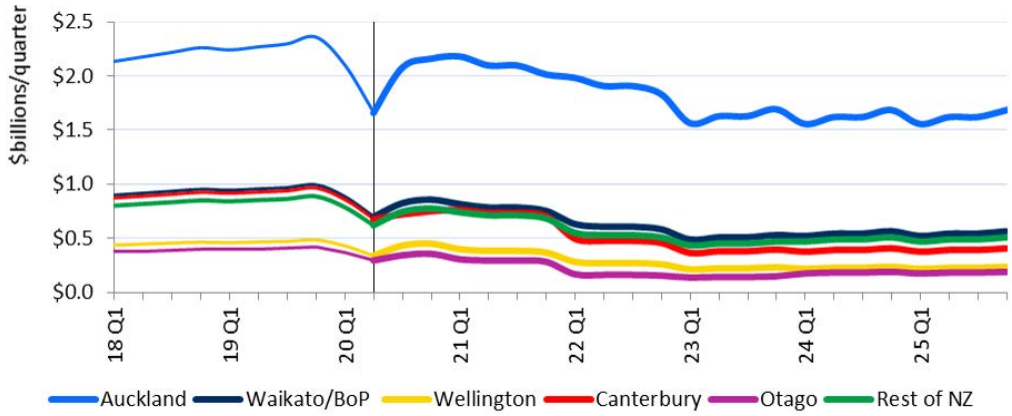
Source: BRANZ/Pacifecon

Residential building regional comparison

Auckland's continued strong growth in residential buildings continued throughout 2019. The lockdown had a pronounced effect on residential building activity in the first two quarters of 2020 throughout New Zealand.

Activity in Auckland is forecast to recover from the lockdowns in the short term, with activity forecast to reach $8.4b in 2021. However, activity is forecast to decline from 2022 onwards to a low of $6.5b in 2024. The other regions show a similar trend to Auckland, just on a slightly smaller scale.

Figure 3.10.2 Value of residential buildings, by region

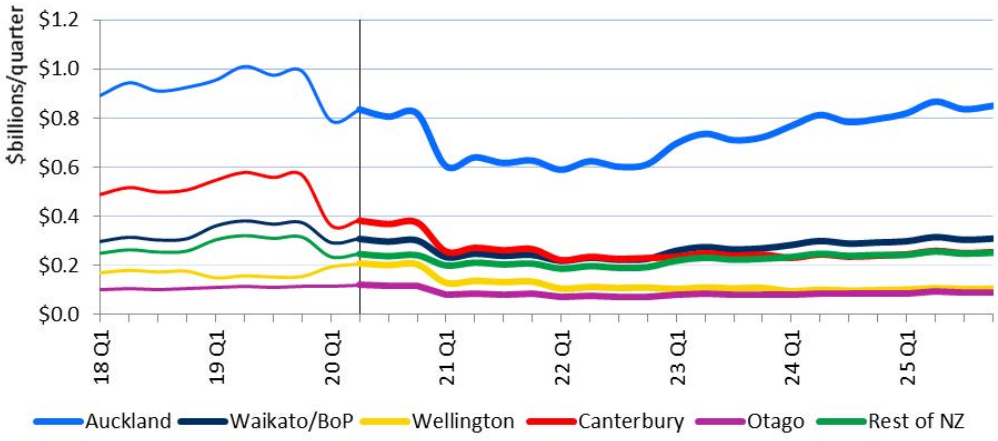


Source: BRANZ

Non-residential building regional comparison

Last year saw strong growth in non-residential activity across most regions. However, the effect of the lockdown can be seen in the first and second quarters of 2020 as activity took a significant hit. Non-residential activity is forecast to remain relatively flat for the next couple of quarters, before decreasing further throughout 2021 and 2022.

Figure 3.10.3 Value of non-residential building, by region

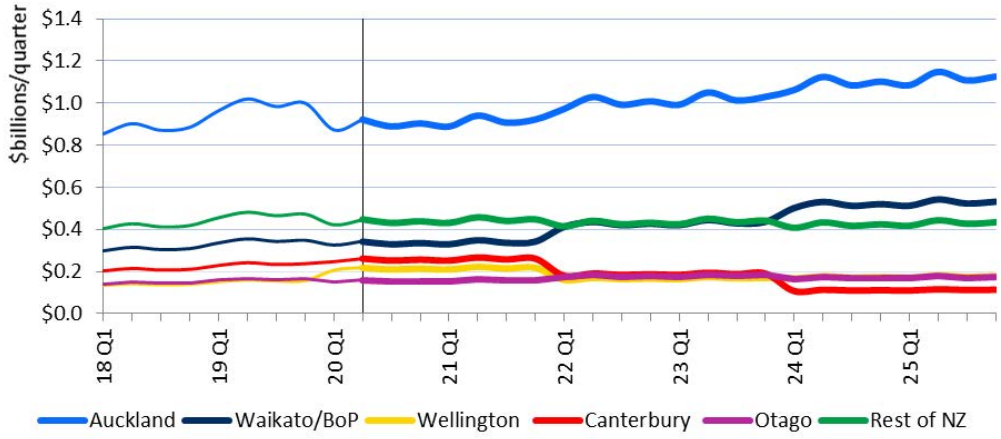


Source: BRANZ

Infrastructure activity regional comparison

Infrastructure activity grew strongly (by 13%) in 2019. Infrastructure forecasts overall are for continued steady growth to 2025. Growth is being driven by transport, subdivisions and water (see Figure 3.8.1). Growth in infrastructure is expected to be particularly strong in Auckland and Waikato/Bay of Plenty. Forward intentions provided by Pacifecon have determined regional change in infrastructure over the forecast period.

Figure 3.10.4 Value of infrastructure activity, by region



Source: BRANZ/Pacifecon

4. Regional forecast

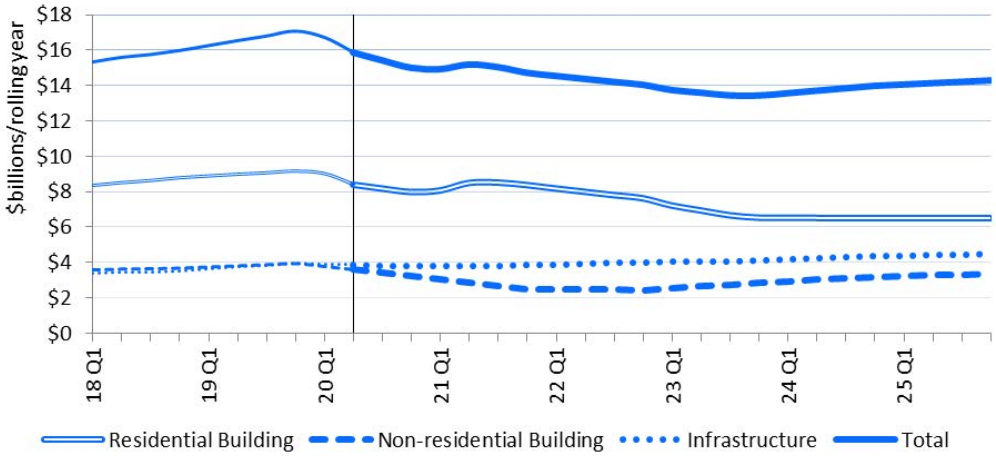
4.1 Auckland[9]

Auckland has always been New Zealand's largest market for building and construction, contributing 40% of total national construction value and 40% of dwelling unit consents in 2019, an increase of 1% for consents from 2018. Auckland is forecast to continue to grow to represent 46% of total national construction value and 47% of dwelling unit consents in 2025.

Growth in value for all sectors was seen in both 2018 and 2019. The total rise in 2019 was 7% to $17.1b. The forecast for Auckland is for a decrease in activity to $13.5b by the end of 2023, a decrease of 21%. In 2024, total growth is forecast at 4%, compared to 2023.

The decrease in total activity is expected to be driven by residential building. Residential building value is forecast to reach $6.5b in 2025.

Figure 4.1.1 All construction in Auckland, by value



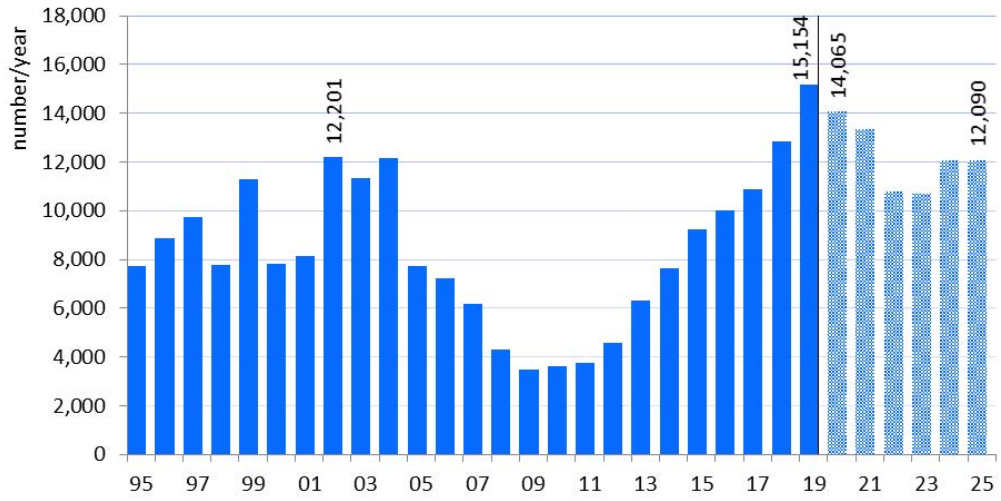
Source: BRANZ/Pacifecon

9 The area covered by Auckland Council.

Auckland dwelling consent activity

The number of dwelling units consented in Auckland grew by 18% to over 15,000 in 2019. Consent growth in 2018 also reached 18%. Reductions in residential consents are forecast for 2020–23. A return to growth in number of consents is anticipated from 2024, reaching over 12,000 consents. As a result, over 73,000 dwelling units are expected to be consented in the six years from 2020 to 2025 (over 96,000 were anticipated over six years in the 2019 report).

Figure 4.1.2 Dwelling units in Auckland, 1995 to 2025

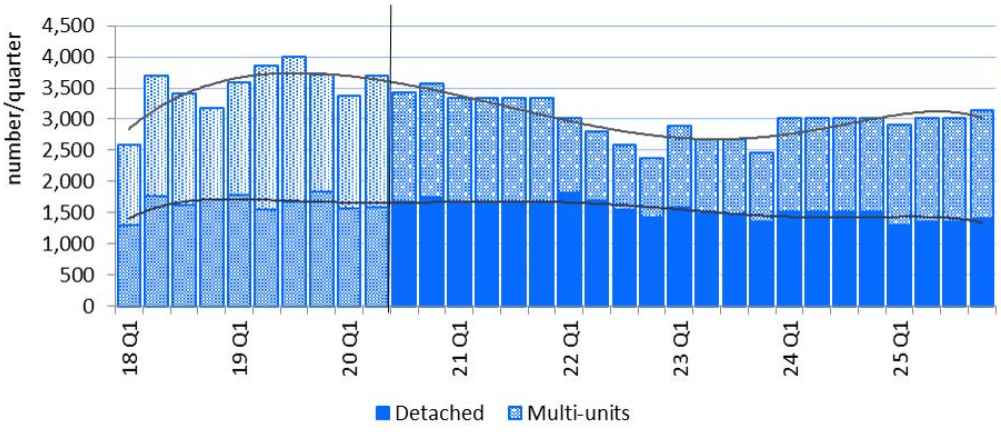


Source: BRANZ/Stats NZ

Auckland multi-unit consents

In recent years, dwelling growth in Auckland has been driven by multi-unit consents. In 2019 (as in 2017 and 2018), the number of multi-units consented exceeded the number of detached consents, contributing 55% of the 15,154 dwellings consented. In 2016, multi-units represented 44%. This trend is expected to reduce slightly over the forecast period with 49% of the over 73,000 dwellings to be consented by 2025 being multi-unit.

Figure 4.1.3 Dwelling units in Auckland

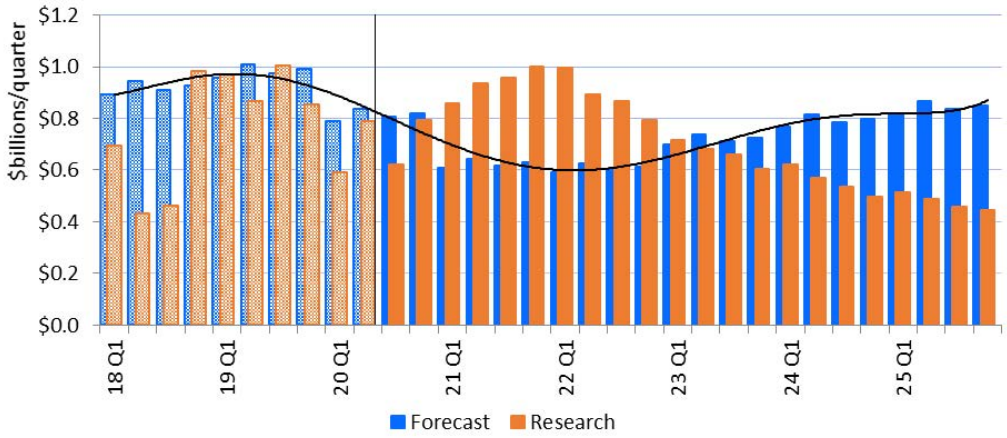


Source: BRANZ

Auckland non-residential building activity

Non-residential building activity in Auckland grew by 5% to $3.9b in 2019. A reduction in activity is now forecast to the end of 2022, when $2.4b non-residential building activity is forecast. From this low, a rise to $3.4b is forecast by 2025. Whilst Pacifecon continues to report strong non-residential construction intentions, many projects have been delayed. The total value of researched work is just slightly below the forecast.

Figure 4.1.4 Auckland non-residential building activity

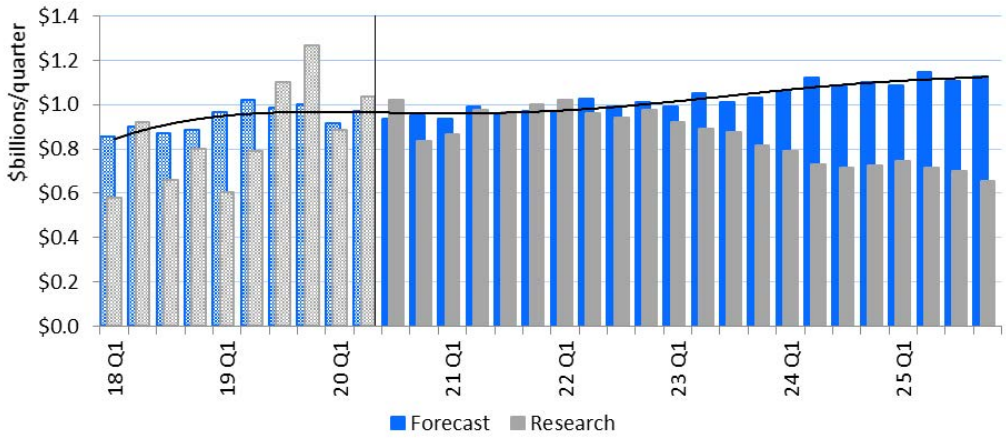


Source: BRANZ/Pacifecon

Auckland infrastructure activity

Infrastructure activity in Auckland increased by 13% in 2019 to $4.0b and is forecast to increase to $4.5b by 2025. The research data shows a high value of known infrastructure project intentions throughout the forecast period, which is typical of large publicly funded civil projects that have long complex planning processes.

Figure 4.1.5 Auckland infrastructure activity



Source: BRANZ/Pacifecon

Planned non-residential building and infrastructure work for Auckland includes:

- retirement village facilities and care units
- hospitals
- schools
- supermarkets and retail
- warehouses and storage facilities, distribution centres, light industrial units
- infrastructure including roads, bridges, rail and subdivisions to support growth in residential building and public transport
- three waters expansion – drinking water, wastewater and stormwater.

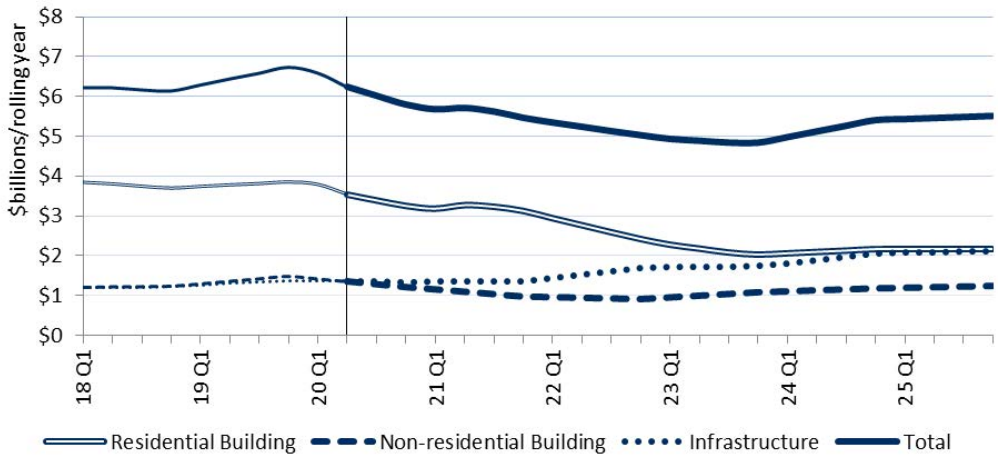
Source: Pacifecon

4.2 Waikato/Bay of Plenty[10]

The total value of construction in Waikato/Bay of Plenty increased by 9% in 2019 to $6.7b, following 5% growth in 2018. All sectors saw growth, with non-residential activity increasing by 21%.

Residential building is forecast to decrease to the end of 2023 to $2.0b per annum before rising again to $2.2b by the end of the forecast period. Non-residential building is forecast to decrease by 39% to $0.9b by 2022 and then rise to $1.2b per annum by 2025 Infrastructure activity in the region is expected to make gains throughout the forecast period, reaching $2.1b per annum by 2025.

Figure 4.2.1 All construction in Waikato/Bay of Plenty, by value



Source: BRANZ/Pacifecon

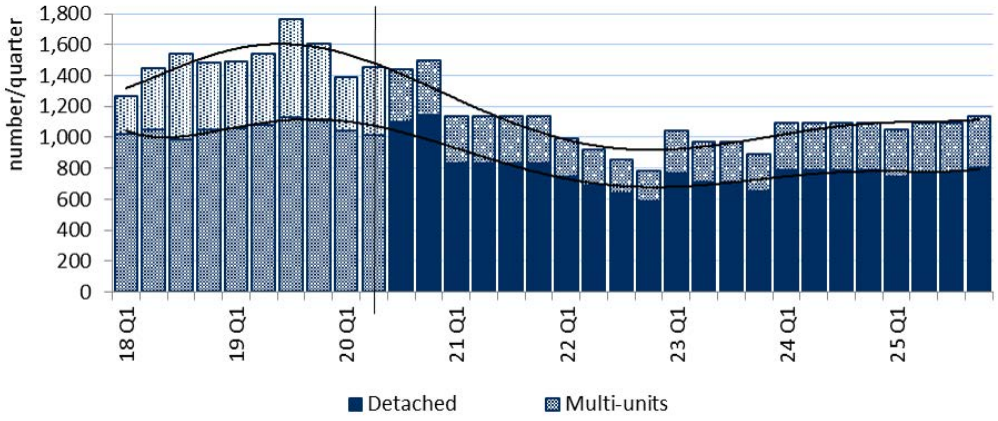
10 Waikato/Bay of Plenty includes Hamilton City, Hauraki District, Kawerau District, Matamata-Piako District, Opotiki District, Otorohanga District, Rotorua District, South Waikato District, Taupo District, Tauranga City, Thames-Coromandel District, Waikato District, Waipa District, Waitomo District, Western Bay of Plenty District and Whakatane District.

Waikato/Bay of Plenty dwelling consent activity

Waikato/Bay of Plenty experienced strong dwelling consent growth to 2016 and again in 2019. In 2019, there was an increase of 11% to 6,397 dwelling consents, 3% more than forecast, caused by an increase in dwelling consents in both Waikato and Bay of Plenty. In 2018, Waikato grew by number of consents whereas Bay of Plenty decreased. Over 5,800 dwelling consents are anticipated in 2020. By the end of the forecast period, over 4,400 consents are forecast per annum.

The forecast includes over 26,000 dwellings consented from 2020 to 2025. Multi-unit consents are anticipated to remain at approximately 27% of all dwelling consents. Waikato/Bay of Plenty is expected to consent the second-largest number of multi-unit dwellings after Auckland between 2020 and 2025. Historical consents show multi-units are more popular in Waikato than Bay of Plenty.

Figure 4.2.2 Dwelling units in Waikato/Bay of Plenty

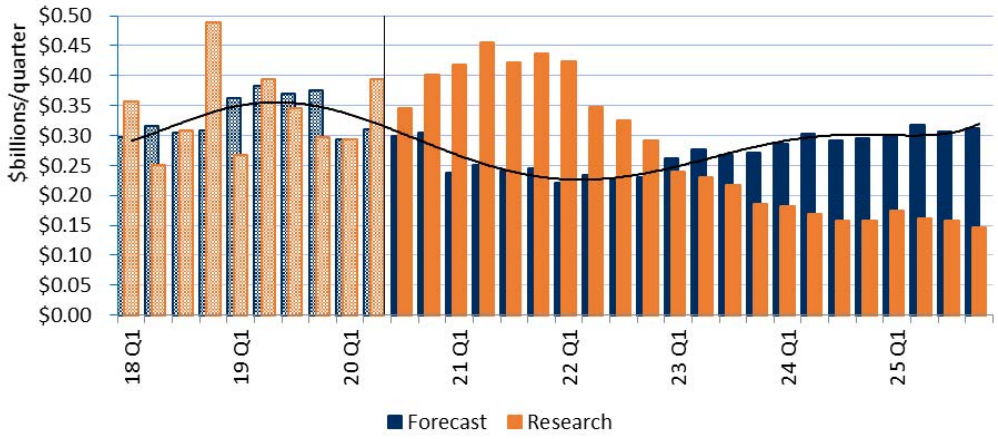


Source: BRANZ

Waikato/Bay of Plenty non-residential building activity

Non-residential building activity in the region increased by 21% to $1.5b in 2019 (the forecast was for 12% growth) following a rise of 26% in 2018. Non-residential building activity is now expected to decrease to $0.9b by 2022 and then increase to $1.2b by 2025.

Figure 4.2.3 Waikato/Bay of Plenty non-residential building activity

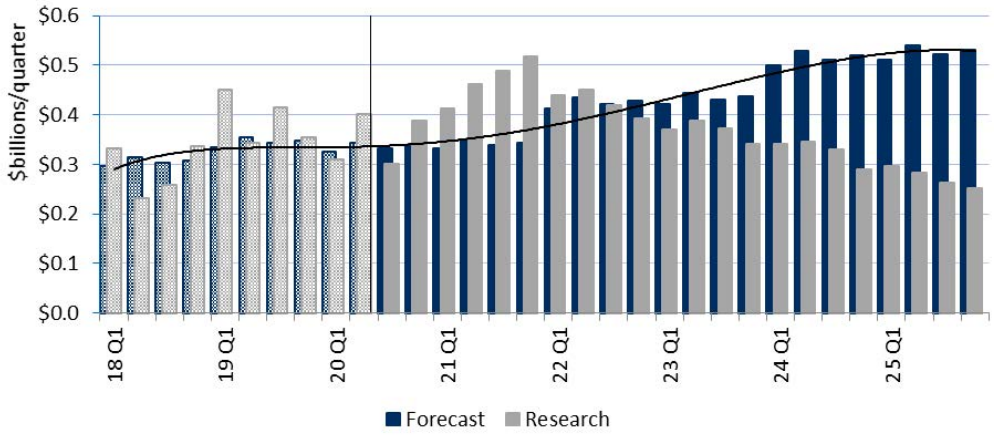


Source: BRANZ/Pacifecon

Waikato/Bay of Plenty infrastructure activity

Infrastructure activity in the region increased in 2019 to $1.4b. Continued infrastructure growth is expected throughout the rest of the forecast period.

Figure 4.2.4 Waikato/Bay of Plenty infrastructure activity



Source: BRANZ/Pacifecon

Planned non-residential building and infrastructure work for Waikato/Bay of Plenty includes:

- education (primary, secondary and tertiary) and research buildings
- hospitals
- manufacturing facilities, processing plants including dairy, warehouses and distribution
- residential, commercial and industrial subdivisions
- infrastructure including roads, rail, electricity
- three waters developments – drinking water, wastewater and stormwater.

Source: Pacifecon

4.3 Wellington[11]

Wellington's total construction activity grew slightly in 2019 to $3.1b. This was despite a fall in non-residential building of 12%. Residential building and infrastructure both grew.

Wellington's total construction value is forecast to maintain at $3.1b in 2020, due to strong growth in non-residential building (31%) and infrastructure (7%). However, residential building is forecast to decrease by 13% this year. From 2021, a decrease is also forecast for non-residential building, to $0.4b per annum level from 2022 to the end of the forecast period. For infrastructure, a decrease is forecast to a low below $0.7b by 2022, then rising slowly throughout the remaining years.

Figure 4.3.1 All construction in Wellington, by value

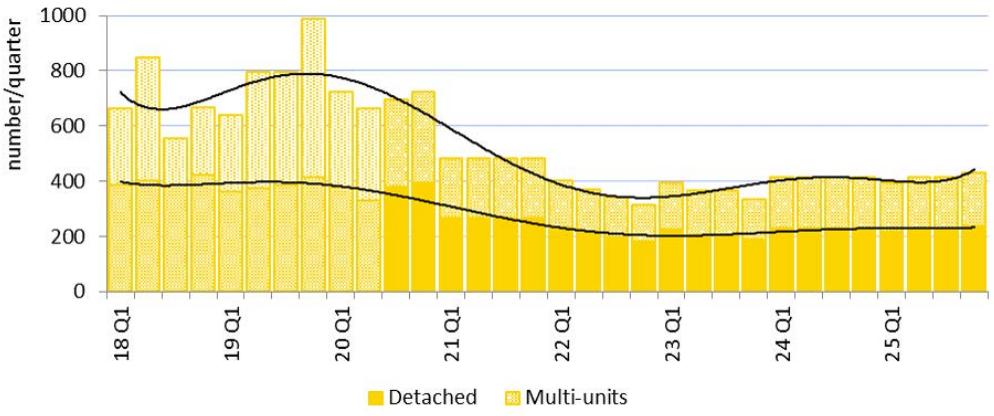
Source: BRANZ/Pacifecon

11 Wellington includes Carterton District, Kapiti Coast District, Lower Hutt City, Masterton District, Porirua City, South Wairarapa District, Upper Hutt City and Wellington City.

Wellington dwelling consent activity

Wellington's dwelling consent numbers increased strongly over the last two years, by 19% in 2018 and by 18% in 2019. A decrease in consents is expected from 2020 through to 2022 when 1,400 consents are forecast for the year. From 2023, a gentle increase in consents is anticipated. Nearly 11,000 dwelling units are expected to be consented between 2020 and 2025. Historically, multi-unit dwellings have been popular in Wellington – 52% of all dwelling consents were for multi-units in 2019. This proportion is expected to reduce slightly over the forecast period to an average of 45%. The proportion of multi-units forecast for Wellington by 2025 is second only to Auckland (49%).

Figure 4.3.2 Dwelling units in Wellington

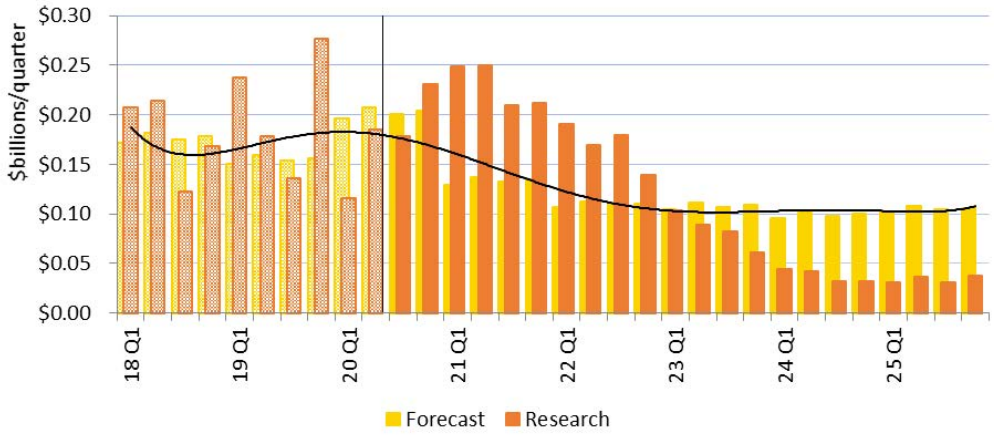


Source: BRANZ

Wellington non-residential building activity

Non-residential building activity in Wellington reduced by 12% to $0.6b in 2019. Strong growth has already occurred, and a rise of 31% to $0.8b is anticipated for 2020. From 2021, a reduction is anticipated with non-residential building activity expected to reduce to $0.4b by 2022 per annum for the remainder of the forecast period.

Figure 4.3.3 Wellington non-residential building activity

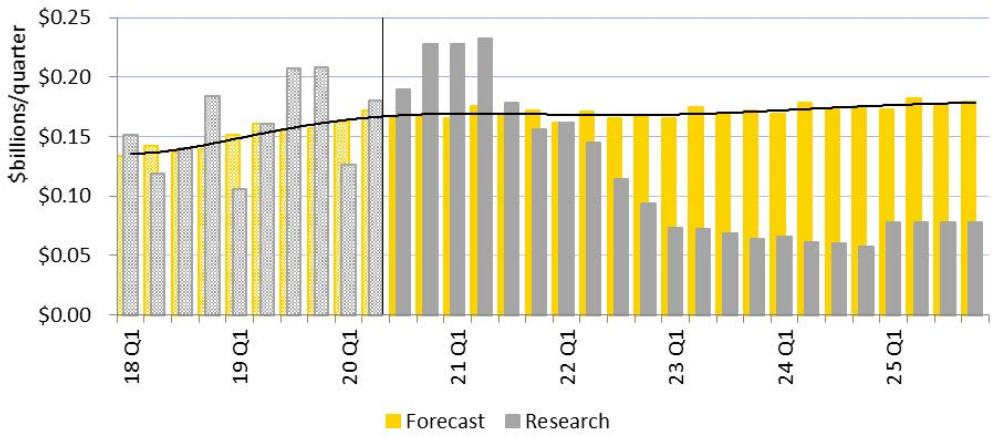


Source: BRANZ/Pacifecon

Wellington infrastructure activity

Wellington infrastructure activity remained around $0.5b per annum from 2015–18 and saw growth to $0.6b in 2019. Further growth to $0.7b is anticipated in 2020–21. A reduction is then expected for 2022, followed by a slight increase for the remaining three years of the forecast period. The high value of research data indicates strong infrastructure project intentions in the region.

Figure 4.3.4 Wellington infrastructure activity



Source: BRANZ/Pacifecon

Planned non-residential and infrastructure work for Wellington includes:

- retirement village communal buildings and care suites
- offices and warehouses
- hospitals
- education buildings
- three waters developments – drinking water, wastewater and stormwater
- residential subdivisions
- infrastructure for rail, road and streetscapes.

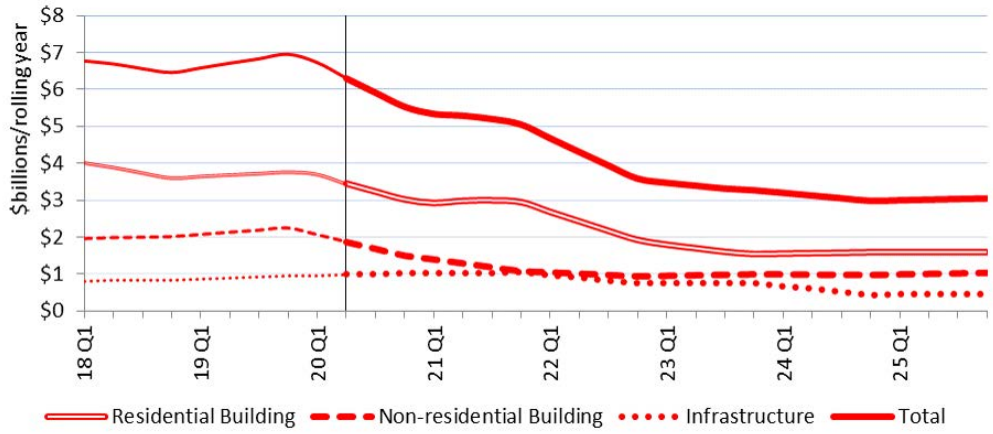
Source: Pacifecon

4.4 Canterbury[12]

Following a reduction in total construction value of 9% in 2018, 2019 saw a rise of 8% to $7.0b. This was driven by rises across all three sectors, with a 12% increase in non-residential building activity being the most influential.

Residential building value is now expected to reduce by 59% to $1.5b by 2023. A gentle increase in activity is then forecast to bring residential building activity to $1.6b per annum for the rest of the forecast period. Non-residential building activity is also expected to reduce by 59% to $0.9b by 2022, and a gentle increase to $1.0b per annum is then expected for the remaining three years to 2025. Infrastructure is forecast to level at $1.0b per annum over 2020–21, after which it is forecast to reduce to $0.4b by 2024.

Figure 4.4.1 All construction in Canterbury, by value



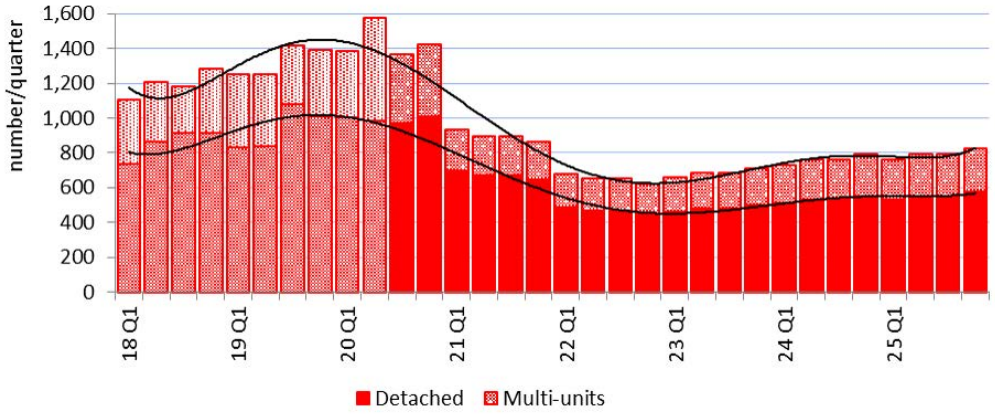
Source: BRANZ/Pacifecon

12 Canterbury includes Ashburton District, Christchurch City, Hurunui District, Kaikoura District, Mackenzie District, Selwyn District, Timaru District, Waimakariri District and Waimate District.

Canterbury dwelling consent activity

The number of dwellings consented in Canterbury grew by 11% in 2019 to 5,300, following a fall of 5% in 2018. Consents in Canterbury are forecast to remain strong at 5,900 in 2020. In 2021, a reduction to 3,600 is forecast, and lower levels are then expected to 2025. Detached homes have historically been popular in Canterbury, with the proportion of multi-unit dwellings standing at 29% in 2019.

Figure 4.4.2 Dwelling units in Canterbury

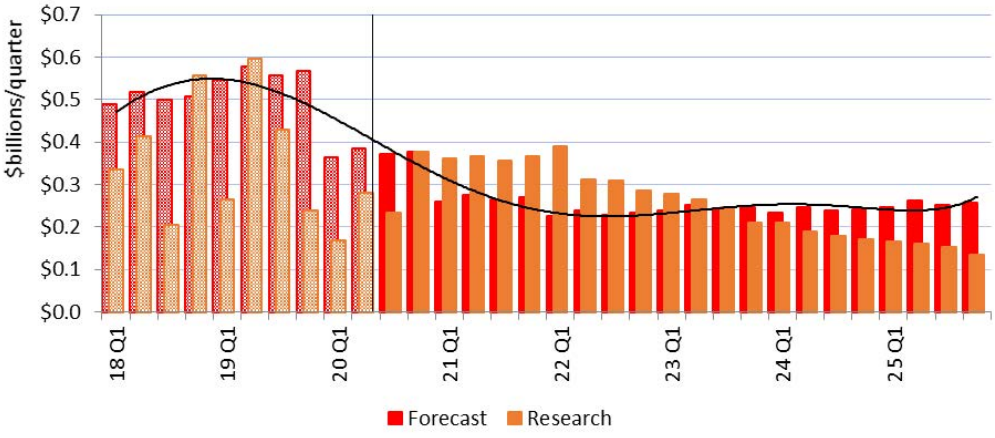


Source: BRANZ

Canterbury non-residential building activity

Non-residential building activity grew by 12% to $2.2b in 2019. Canterbury non-residential building is now expected to reduce to $1.5b in 2020 and then reduce further in 2021 to $0.9–1.0b for the remainder of the forecast period.

Figure 4.4.3 Canterbury non-residential building activity

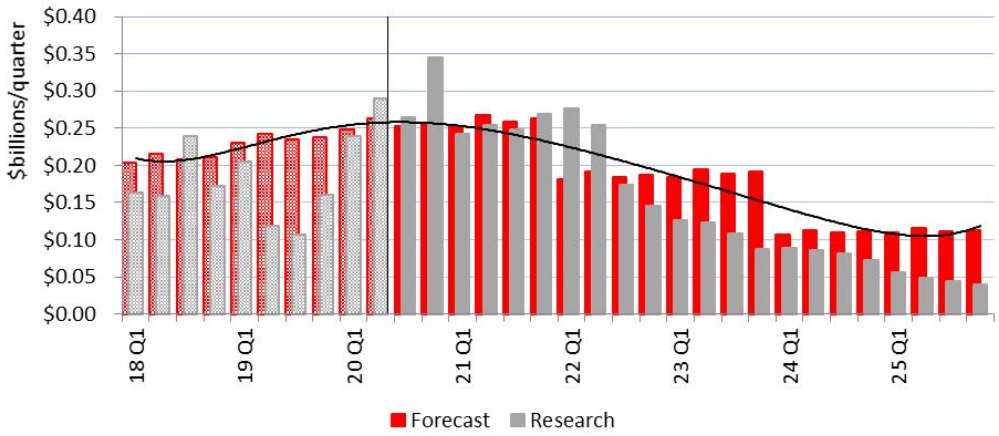


Source: BRANZ/Pacifecon

Canterbury infrastructure activity

Infrastructure activity increased in 2019 to $0.9b. It is forecast to rise again to $1.0b per annum for 2020–21 and then decrease to $0.4b by 2024.

Figure 4.4.4 Canterbury infrastructure activity



Source: BRANZ/Pacifecon

Planned non-residential buildings and infrastructure work for Canterbury includes:

- hospitals
- bulk retail, factories and offices
- research facilities and education buildings
- sports facilities
- places of worship
- dairy processing plants – new and expansion of existing facilities
- infrastructure – roads, three waters developments – drinking water, wastewater and stormwater including flood protection
- residential subdivisions.

Source: Pacifecon

4.5 Otago[13]

For the last seven years, this report has included Otago within the Rest of New Zealand region. For the first time, it is treated separately.

Following a reduction in total construction value in 2018, a rise of 7% to $2.7b in 2019 was a result of growth across all three sectors. Otago is expected to be hard hit in the long term by the effects of general COVID-19 pandemic and border restrictions.

Residential building is now expected to reduce by 65% to $0.6b by 2023. A gentle increase in activity is then forecast to bring residential building to $0.7b per annum for the rest of the forecast period. Non-residential building activity is expected to reduce to $0.3b per annum by 2021 and remain at that level for the rest of the forecast period, rising slightly in 2025. Infrastructure is forecast to rise to $0.7b per annum in 2022 and remain at this level for the rest of the forecast period.

Figure 4.5.1 All construction in Otago, by value

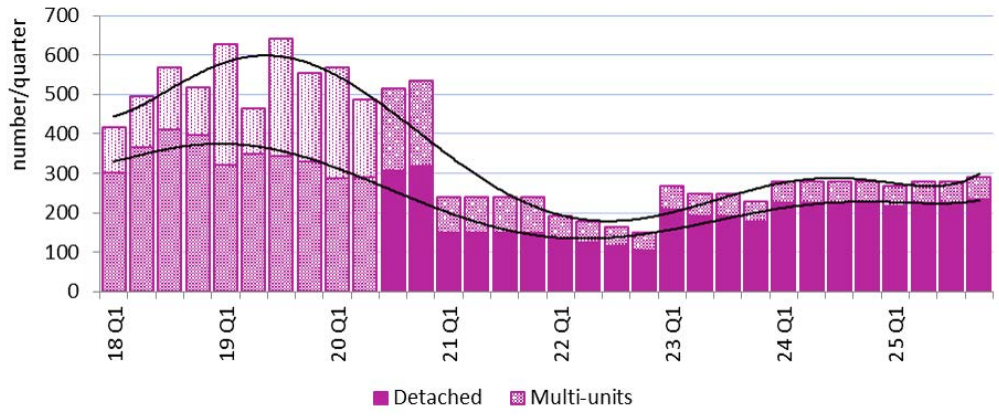
Source: BRANZ/Pacifecon

13 Otago includes Otago Region, Dunedin City, Central Otago District, Clutha District, Queenstown-Lakes District and Waitaki District.

Otago dwelling consent activity

The number of dwellings consented in Otago reduced by 11% in 2018 but then increased again by 14% to 2,286 in 2019. Consents in Otago in 2020 are forecast to reduce to 2,100 in 2020. In 2021, a further reduction to below 1,000 is forecast, and levels below 1,100 are then expected to 2024. Detached homes have historically been popular in Otago, with the proportion of multi-unit dwellings standing at 41% in 2019. This proportion is expected to reduce to below 20% by 2025.

Figure 4.5.2 Dwelling units in Otago

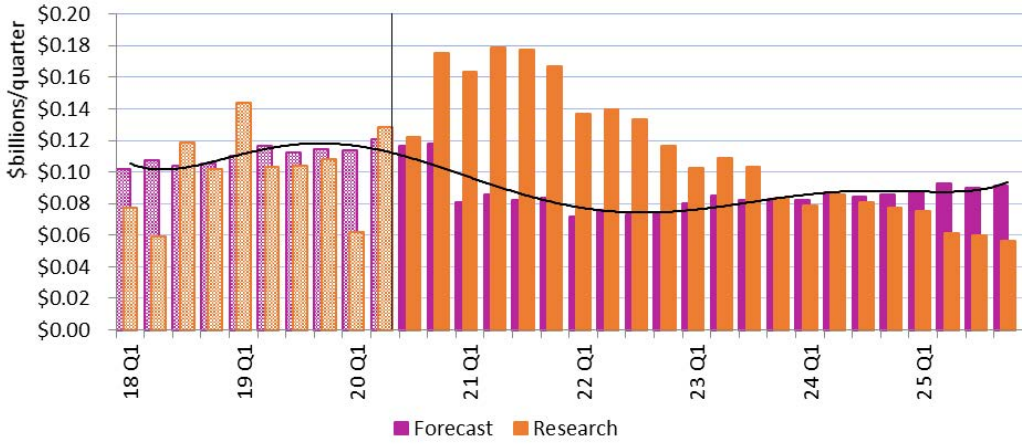


Source: BRANZ

Otago non-residential building activity

Non-residential building activity grew by 8% to $0.5b in 2019 and is forecast to remain at this level for 2020. A reduction in activity of 29% to $0.3b in 2021 is then expected, and non-residential building is anticipated to remain at this level until 2025 when it is forecast to lift to $0.4b.

Figure 4.5.3 Otago non-residential building activity

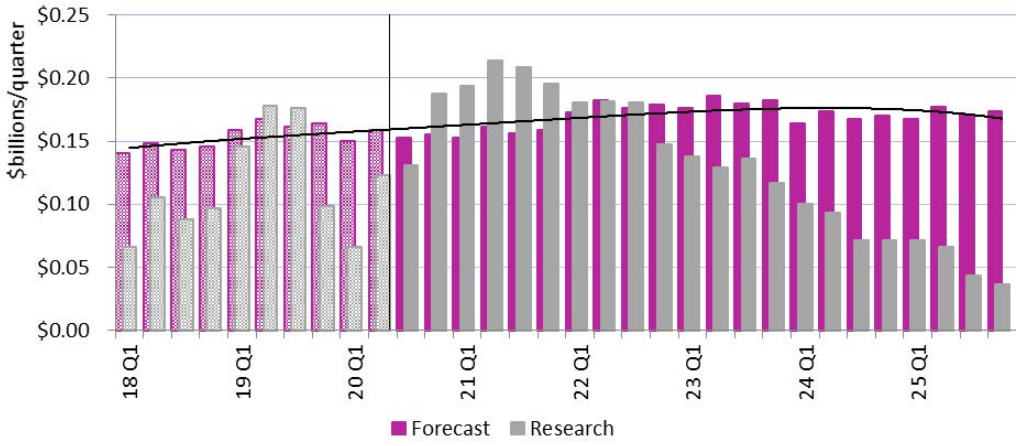


Source: BRANZ/Pacifecon

Otago infrastructure activity

Infrastructure activity increased in 2019 to $0.7b. It is forecast to fall to $0.6b per annum for 2020–21 and then rise to $0.7b per annum for 2022–25.

Figure 4.5.4 Otago infrastructure activity



Source: BRANZ/Pacifecon

Planned non-residential buildings and infrastructure work for Otago includes:

- hospitals
- education buildings
- hotels and tourist attractions
- infrastructure – electricity, roads, cycleways,
- three waters developments – drinking water, wastewater and stormwater including flood protection
- residential subdivisions.

Source: Pacifecon

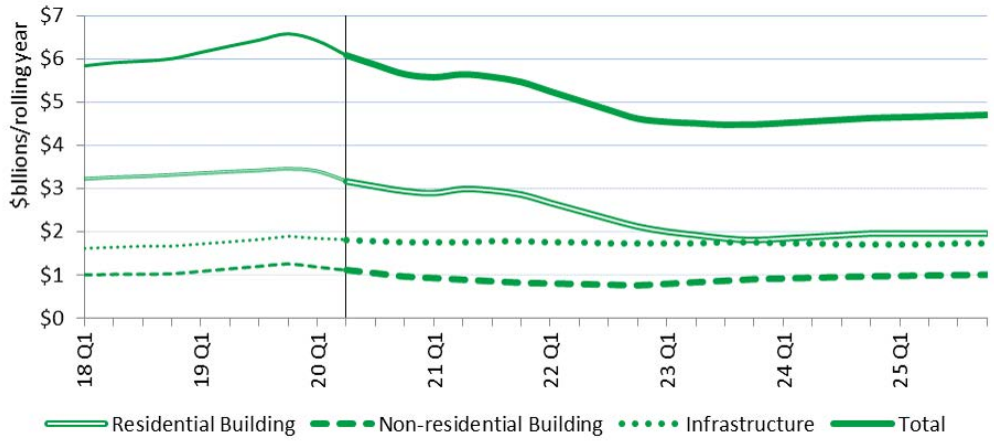
4.6 Rest of New Zealand

Rest of New Zealand contains the remaining 10 regions of New Zealand – Gisborne, Hawke's Bay, Manawatu-Whanganui, Marlborough, Nelson, Northland, Southland, Taranaki, Tasman and West Coast. These regions individually all have a lower value of total construction activity and populations[14] than the other regions considered in this report.

For Rest of New Zealand, total construction value grew 10% to $6.6b in 2019. Growth was driven by a 22% increase in non-residential building and supported by growth of 13% in infrastructure and 4% in residential building.

Total construction value for Rest of New Zealand is forecast to decrease for the next four years to $4.5b per annum. This decrease is anticipated across the residential and non-residential building sectors. A return to growth for all sectors is forecast for the final two years of the forecast period, with value of $4.7b anticipated for 2025.

Figure 4.6.1 All construction in Rest of New Zealand, by value



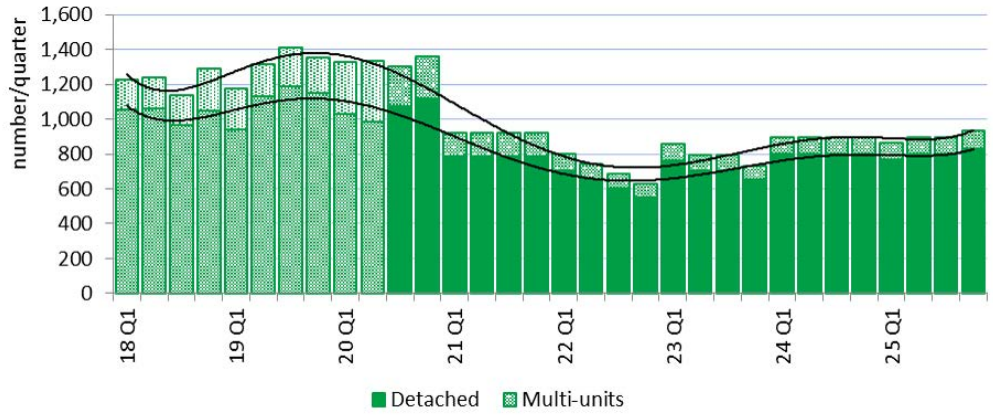
Source: BRANZ/Pacifecon

14 Some regions have static or decreasing populations.

Rest of New Zealand dwelling consents

Dwelling unit consents in Rest of New Zealand grew by 8% in 2019 to 5,300 following similar growth in 2018 and remaining high into 2020. Dwelling unit consents are forecast to reduce for the next three years to 2,700 in 2022. By 2024, this number is forecast to have risen to nearly 3,600. Multi-units are not as popular in these regions, and their proportion is expected to maintain between 10–15%.

Figure 4.6.2 Dwelling units in Rest of New Zealand

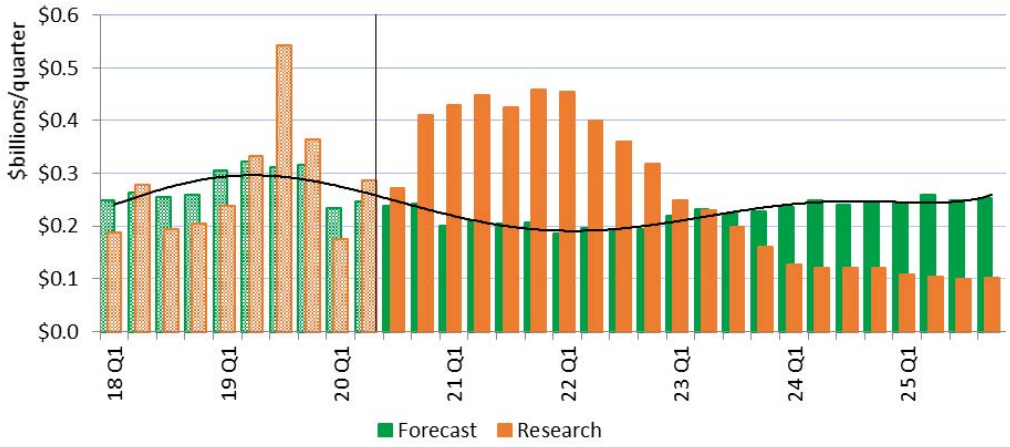


Source: BRANZ

Rest of New Zealand non-residential building activity

Rest of New Zealand's non-residential building activity reduced slightly (-3%) in 2018 and grew by 22% to $1.3b in 2019. Activity is forecast to fall again in 2020 by 23% and reach below $0.8b in 2022. From 2023, year-on-year rises are anticipated. The very high value in the research data indicates that there are strong intentions for non-residential buildings in Rest of New Zealand, but Pacifecon anticipates many will be pushed further into the future.

Figure 4.6.3 Rest of New Zealand non-residential building activity

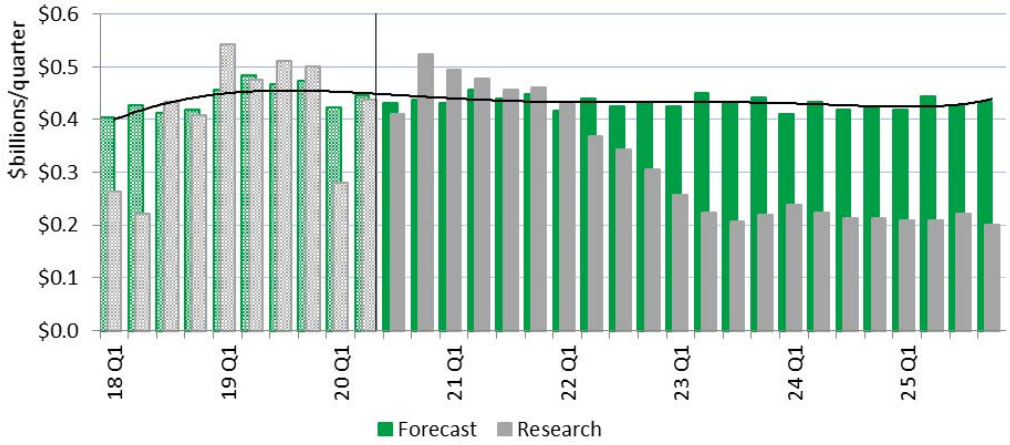


Source: BRANZ/Pacifecon

Rest of New Zealand infrastructure activity

Infrastructure activity rose in 2018 and 2019 to $1.9b and is forecast to fall by 9% to $1.7b by 2022. Similar levels are then anticipated for the rest of the forecast period.

Figure 4.6.4 Rest of New Zealand infrastructure activity



Source: BRANZ/Pacifecon

Individual regions within Rest of New Zealand

In previous years, Otago formed a part of the Rest of New Zealand but this year has become an individual region. Northland is now the largest region[15] in the Rest of New Zealand group and provides 15% of the group's new dwelling unit consents. Pacifecon's research data indicates considerably more infrastructure for Northland but a much lower value of non-residential building activity. Otago has been included in Table 4.6.1 below for comparison with Northland.

Table 4.6.1 All building and construction in the year 31 December 2020 for Rest of New Zealand and Otago, by region and construction type

Region	Forecast residential building ($m)	Researched non-residential building ($m)[16]	Researched infrastructure activity ($m)
Otago	$1,349	$488	$508
Northland	$670	$159	$633
Manawatu/Whanganui	$605	$217	$272
Nelson/Marlborough	$549	$144	$250
Hawke's Bay/Gisborne	$477	$233	$182
Taranaki	$319	$52	$204
Southland	$198	$86	$25
West Coast	$63	$34	$80
New Zealand wide[17]	-	$217	$6
Total – Rest of New Zealand	**$2,881**	**$1,143**	**$1,652**

Source: BRANZ/Pacifecon

15 By total construction value and number of new dwelling consents.

16 Values in red are from Pacifecon's database of anticipated project values and may be subject to optimism bias.

17 New Zealand wide is used in Pacifecon's dataset to define work that covers all of New Zealand – for example, ultra-fast broadband rollout.

5. Impact of the COVID-19 pandemic on construction activity

5.1 Modelling different assumptions

Construction activity taking a hit as a result of the COVID-19 pandemic seems inevitable. However, it remains unclear the extent to which both residential and non-residential activity could be impacted and how key decision makers are going to react to uncertain times. The forecasts presented above have taken some lessons from the Global Financial Crisis (GFC) but also recognise that the pandemic is a very different shock and we are operating in a very different environment.

Given the uncertainty surrounding the longer-term impact of the pandemic, we have undertaken additional modelling in this report to illustrate how our forecasts would change if:

› the economy outperforms/underperforms forecasts (i.e. GDP ±1% p.a.)

› net migration is higher/lower than forecast (±20,000 persons p.a.).

We present the additional modelling as two new scenarios:

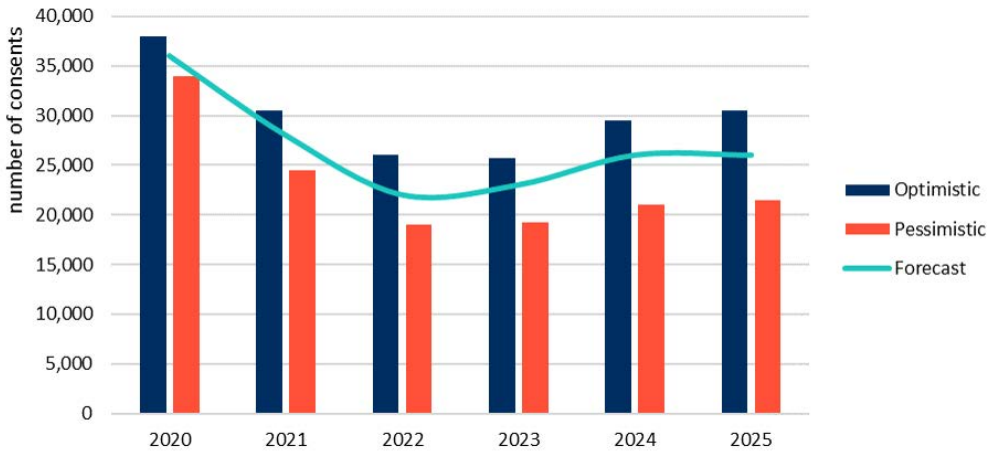
› An optimistic scenario: GDP is 1% higher than forecast and net migration is 20,000 higher than forecast.

› A pessimistic scenario: GDP is 1% lower than forecast and net migration is 20,000 lower than forecast.

In reality, these scenarios do not cover all possible outcomes going forward, and it is unlikely that we will follow any one scenario throughout the forecast period. However, these scenarios provide context to the forecasts previously presented and a range of potential outcomes for construction activity going forward.

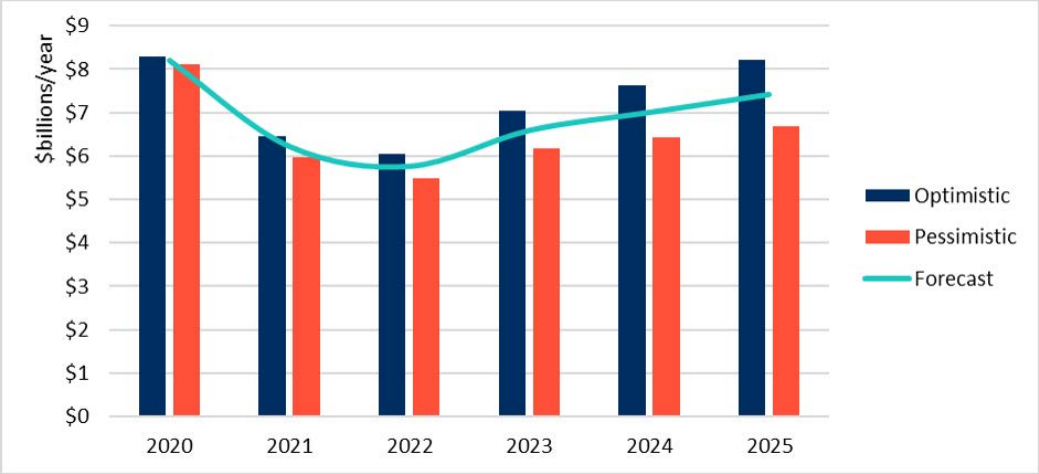
New dwelling consenting activity could be significantly impacted by a change in the current assumptions. Lower net migration and an economy that performs worse than current forecasts could lead to new dwelling consents falling to 19,000 per year by 2022. In contrast, an economy that outperforms current forecasts and higher net migration could see consenting levels fall to just 25,750 in 2022 – over 11,500 lower than the 2019 peak. The extent to which these assumptions impact our forecasts shows how volatile residential consenting activity can be to current and future conditions.

Figure 5.1.1 New dwelling consents based on optimistic and pessimistic scenarios



In contrast, non-residential activity is not impacted to the same degree by the change in assumptions. Non-residential activity had been forecast to be nearing its peak pre-COVID-19 and therefore had been forecast to start to decline in the short term. The current pandemic is forecast to hasten the decline in non-residential activity. However, the impact of the assumptions on the value of non-residential building activity is not as significant as for the residential sector.

Figure 5.1.2 Non-residential building activity based on optimistic and pessimistic scenarios



6. Comparison with the National Construction Pipeline Report 2019

6.1 Adjustments to data from the 2019 report

The following adjustments have been made to the forecast data from the 2019 report to enable a closer comparison with actuals and forecasts in this report:

- Conversion from December 2018 dollars to December 2019 dollars to account for inflation[18] as follows:
  - Residential building 3%
  - Non-residential building 5.4%
  - Infrastructure construction 1.6%
- Adjustments for Stats NZ's revisions to the December 2018 gross fixed capital formation data:[19]
  - Residential building 3.8%
  - Non-residential building 1.5%
  - Infrastructure construction -19.5%

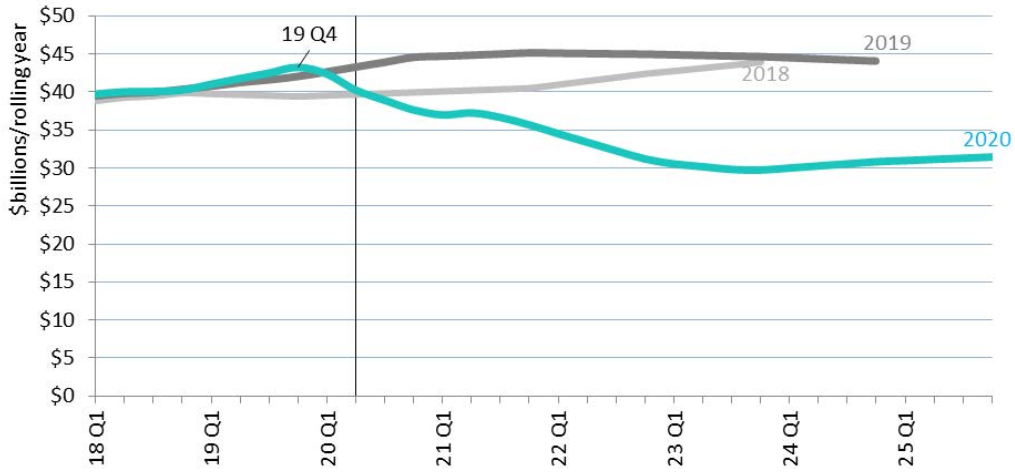
6.2 How did BRANZ do with the 2019 forecast?

The total value of construction nationally grew by 7% in 2019, whereas the 2019 report had expected 4% growth.

Residential building grew by 4% – 1% less than expected. Non-residential building grew by 10% – 8% more than expected. Infrastructure construction grew by 13% – 10% more than expected.

This year's forecast to 2025 is for a reduction in growth to 2023, followed by growth for the remaining two years of the forecast period.

Figure 6.2.1 All construction nationally, last three years of forecasts compared



Source: BRANZ/Pacifecon

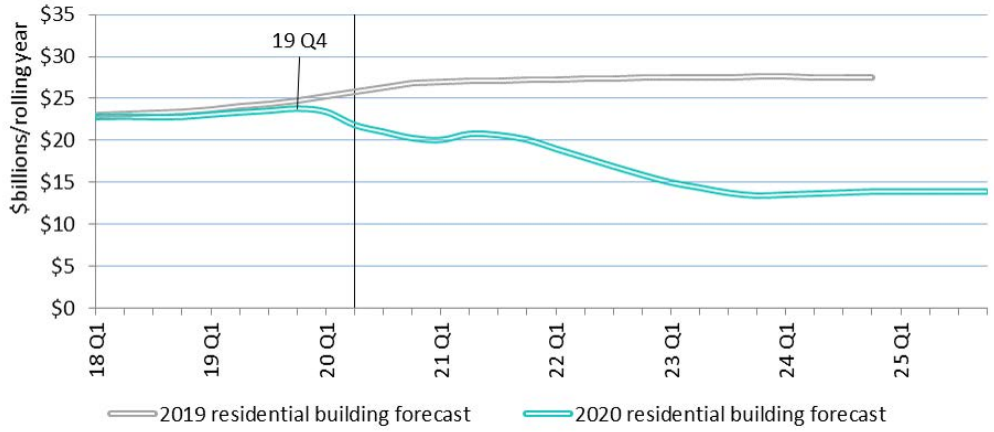
18 All previous reports have been adjusted to December 2019 dollars for comparison.

19 Stats NZ adjusts the gross fixed capital formation data following its initial release for a couple of years. It is likely this data will be adjusted again, either up or down, in the next 12 months.

Residential building forecast comparison

The 2019 report forecast 5% residential building growth for 2019 nationally while actual recorded growth was slightly lower at 4%. The current report forecasts residential building to decrease by 44% to $13.4b by 2023. A slight increase is then forecast to the end of 2025. We anticipate residential activity to be strongly hit by the COVID-19 pandemic as banks tighten lending requirements.

Figure 6.2.2 All residential building nationally, 2019 and 2020 forecasts compared



Source: BRANZ

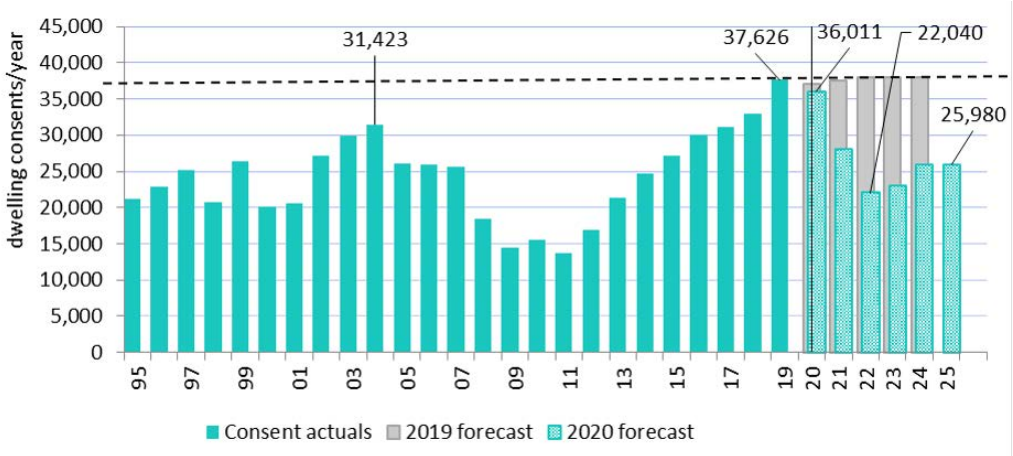
Dwelling unit forecast comparison

The 2019 report forecast 9% dwelling consent growth for 2019 nationally while actual consent growth was higher at 14%. The number of consents for detached homes was 6% lower than the 2019 forecast, while the number of consents for multi-units was considerably higher than forecast at 25%.

The 2020 forecast is for a reduction in growth to 2022, followed by year-on-year increases to the end of the forecast period. This is significantly different to the 2019 forecast as the pandemic has a significant impact throughout the sector.

Over the next three years, the number of dwelling units consented is forecast to decrease by 44% to 22,000 dwelling units in 2022. A modest rise is then anticipated each year through to 2024

Figure 6.2.3 Dwelling units consented nationally, 2019 and 2020 forecasts comparison

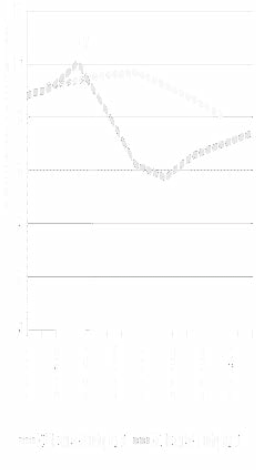


Source: BRANZ/Stats NZ

Non-residential building forecast comparison

The 2019 report forecast 2% non-residential building growth for 2019 nationally while actual recorded growth was considerably higher at 10%. This year's report forecasts a fall in non-residential building activity to 2022, followed by a rise to the end of the forecast period.

Figure 6.2.4 Non-residential building nationally, 2019 and 2020 forecasts compared

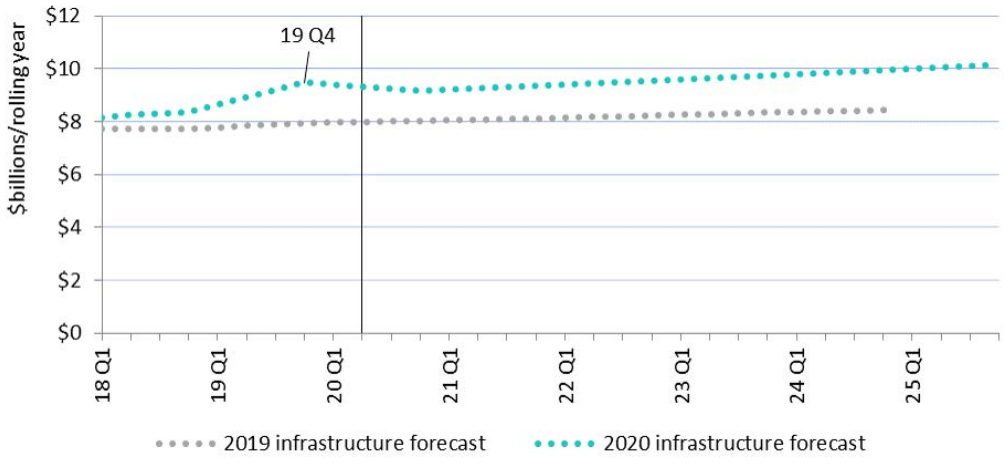


Source: BRANZ

Infrastructure construction forecast comparison

National infrastructure values are historically more consistent year on year than residential or non-residential building activity values. Last year's report expected 3% infrastructure growth, whereas actual recorded activity was a 13% increase. In between reports, there were significant revisions to gross fixed capital formation for the infrastructure sector. Infrastructure activity nationally is expected to grow at a similar rate to that previously forecast.

Figure 6.2.5 Infrastructure activity nationally, 2019 and 2020 forecasts compared



Source: BRANZ

6.3 Comparison of Pacifecon's 2020 research data with previous reports

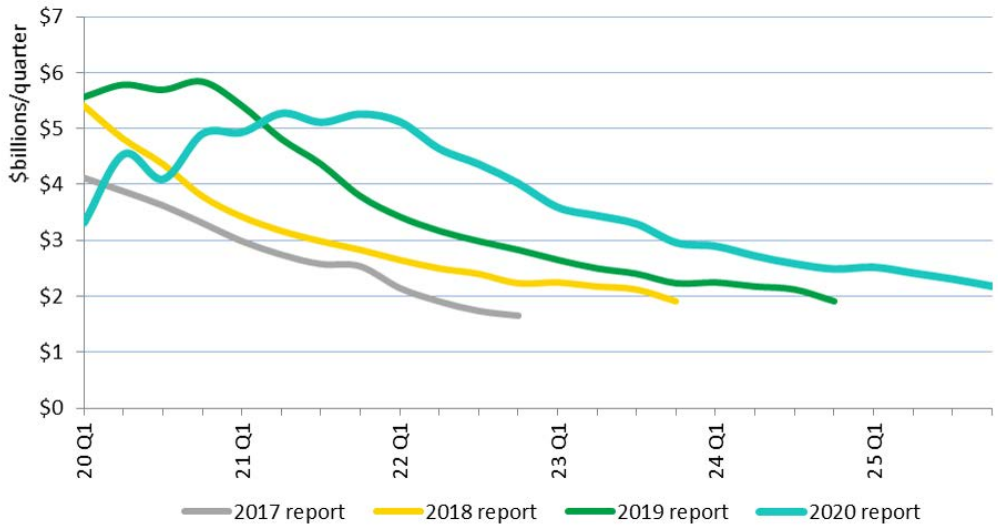
Pacifecon's research dataset contains anticipated values and start dates for non-residential buildings and infrastructure construction projects. This section compares Pacifecon's 2020 researched data with the data used in preceding reports. It compares how the value and timeline of Pacifecon's researched project intentions have varied across reports.

The 2020 research data has reduced in the short term and is further delayed than in the 2019 report with the peak pushed out into 2021 and with a less steep decline for future years. This has been caused by delays due to the lockdown in April 2020 and ensuing uncertainty. The data has been adjusted to account for delay.

The research data for the 2017 and 2018 reports show reasonably similar curves to each other. Pacifecon's view is there are still further adjustments to come before 2021 – projects always take longer than anticipated.

The report highlights where the research data has indicated strong known project intentions for non-residential and infrastructure projects throughout the forecast period.

Figure 6.3.1 Value of all Pacifecon known non-residential and infrastructure project intentions data, by report year



Source: Pacifecon

6.4 Comparison of previous reports' project intentions with project outcomes

For the last four years, Pacifecon's research dataset has shown an increase in the number of projects totaling over $100m anticipated to start each year. The total number of $100m projects in the database expected to start in 2019 (31) was very close to the actual number started (30). Section 0 describes the optimism bias that ultimately occurs with specific project intentions. Comparing the projections with actuals over time helps to inform how to accurately adjust for this bias. 2019 was the most accurate year so far.

Table 6.4.1 compares what was projected and actuals over the previous five reports. There were 31 known projects (non-residential building and infrastructure construction) valued at $100m or more included in the 2019 report that were anticipated to start between 1 April 2019 and 31 March 2020. Just over half of these projects (16 out of 31) started as anticipated.

The number of known projects valued at over $100m expected to start between 1 April 2020 and 31 March 2021 has now decreased to 25 projects (four non-residential building and 21 infrastructure projects, see Appendix D for details).

Table 6.4.1 Outcome of projects valued at $100 million and over anticipated to start in the current year across the current and previous reports

Outcome	Number of projects anticipated to be initiated				
	2015 report	2016 report	2017 report	2018 report	2019 report
Started as anticipated	15	15	18	23	16
Anticipated to start within the coming year	3	10	9	12	2
Anticipated to start beyond one year's time	0	4	9	11	13
Cancelled since previous report	2	0	0	1	0
Total	20	29	36	47	**31**
Additional projects starting[20]	8	7	10	6	14
Number of projects started in timeframe	26	22	28	29	**30**

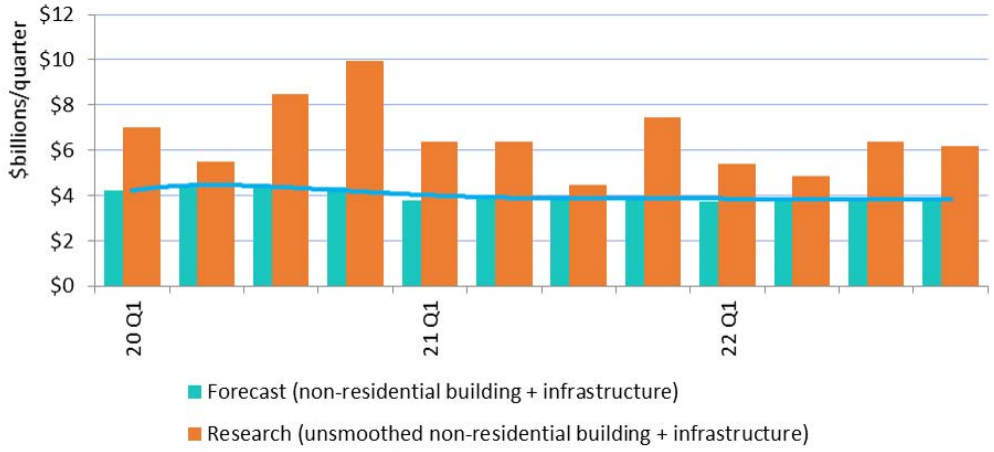
Source: Pacifecon

20 Additional projects starting since 2019 report: two projects new to Pacifecon, the values of five projects increased to over $100m prior to commencing, one project was accelerated so it started within the April 2019–March 2020 time period.

6.5 Construction intentions and optimism bias

All intentions in building and construction come with some level of overconfidence – this is termed 'optimism bias'. Projects may lag behind their original timelines or are occasionally cancelled. This optimism bias of non-residential building and infrastructure construction intentions in the Pacifecon dataset can be seen in the raw (unsmoothed) researched intentions data. This results in a higher than expected number of projects over the next few years and a lower than expected number of projects over the longer term.

Figure 6.5.1 All non-residential and infrastructure construction intentions, raw (unsmoothed) data



Source: BRANZ/Pacifecon

7. Disclaimer

All reasonable care has been taken in gathering, compiling and producing the information specified in this report. Pacifecon (NZ) Ltd, BRANZ and MBIE will not be responsible for errors, omissions or inaccuracies or liable for any claims, actions or suits arising directly or indirectly therefrom.

Pacifecon (NZ) Ltd does not typically use its database for this type of analysis. This has required additional data manipulation and changes to its database and processes. Over time, the techniques and processes may be further refined.

Advice has been sought from a variety of sources, and it is believed that the methodology has a sound basis for future reporting.

Queries and feedback can be emailed to info@building.govt.nz

8. Appendices

8.1 Appendix A: About the parties involved in preparing this report

BRANZ is an independent and impartial research, testing and consulting organisation challenging Aotearoa New Zealand to create a building system that delivers better outcomes for all. This is achieved by transforming insightful research into accessible actionable knowledge.

BRANZ is focused on:

- researching and investigating the design, construction and performance of buildings that impact the built environment in New Zealand
- enabling the transfer of knowledge from the research community into the building and construction industry.

www.branz.co.nz

Pacifecon focuses exclusively on the New Zealand and Pacific Islands construction industry, providing business intelligence in the form of future residential, non-residential and infrastructure project information to its client base. Information is also held on projects that may have a work start date far beyond 2025 including local government long-term plans.

Pacifecon have over 30 researchers spread throughout New Zealand. Using their local knowledge in each of the regions and sectors, they deliver thorough, timely and accurate information on construction projects from the earliest planning stages to start of work across all construction sectors:

- Residential building: subdivisions, houses, apartments and retirement villages.
- Non-residential building: commercial, industrial, education, health and sport.
- Infrastructure: civil, heavy engineering and energy.

www.pacifecon.co.nz

8.2 Appendix B: Terminology, abbreviations and definitions used in this report

actuals	Documented historical values that have been realised.
apartment	Any dwelling unit that is attached to another dwelling unit above or below it or that is part of a commercial building is considered an apartment. Apartments in retirement villages are not included.
b	Billion (1,000,000,000 or 109).
boom-bust cycle	A process of economic expansion (boom) and contraction (bust) that occurs repeatedly.
building consent	A formal approval from a building consent authority to construct or alter a building.
COVID-19	A worldwide pandemic that has resulted in restrictions and economic measures being undertaken in New Zealand.
detached dwelling	Any stand-alone dwelling unit that is not attached to any other unit (i.e. a typical house on its own section).
dwelling	A building that is used for the purpose of human habitation. Dwellings include detached and multi-unit dwellings
forecast	Refers to BRANZ's information on expected future activity.
forecast period	The six years from 1 January 2020 to 31 December 2025 for which building and construction activity is forecast in this report.
gross fixed capital formation	Net/gross increase in physical assets (investment minus disposals) within the measurement period. It does not account for the consumption (depreciation) of fixed capital or the cost of land purchases. It is a component of the expenditure approach to calculating gross domestic product (expenditure). This report uses gross fixed capital formation. Routine maintenance is not included. Alterations and additions that significantly extend the life or capacity of an asset are included (i.e. all work done with an addition and alteration consent).
infrastructure	Infrastructure covers all construction that is not a building, including: › transport: roads, rail, bridges, tunnels, runways, harbours, marinas, reservoirs, shelters, parking and lighting › ground works: residential, commercial and industrial subdivisions, earthmoving, landscaping, parks and landfill › amenities: telecommunications, water and energy services › mining and energy: wind, thermal, hydro, oil and gas. Infrastructure is termed 'other construction' in Stats NZ classifications.
lockdown	The period of Alert Level 4 in New Zealand in response to the COVID-19 pandemic, 26 March – 27 April 2020.
m	Million (1,000,000 or 106).
multi-unit dwelling	Separate occupancy dwelling with a wall, ceiling and/or floor in common with another dwelling unit. This category includes apartments, townhouses and retirement village units.

non-residential buildings	Values include new construction, additions and alterations to vertical structures, including hostels, boarding houses, prisons, hotels, motels, hospitals, nursing homes, schools, libraries, museums, churches, shops, restaurants, bars, offices, factories and warehouses.
optimism bias	Overconfidence that is associated with building and construction intentions.
p.a.	Per annum
quarters	Q1: January to March. Q2: April to June. Q3: July to September. Q4: October to December.
research	Refers to Pacifecon's researched construction project intentions data.
residential buildings	Includes houses and multi-unit dwellings. Value of residential buildings includes the value of additions and alterations. The number of dwelling consents excludes additions and alterations.
retirement village units	All retirement village units from detached houses to apartments and rooms. The common areas are captured as non-residential buildings.
rolling years	The aggregation of values from the 12 months immediately preceding a particular point in time – for example, 2020 Q2 is the aggregate of the values from July 2019 to June 2020.
smoothing process	Process of spreading the total cost of a project over its intended construction duration and adjusting for optimism bias.
townhouse	The Stats NZ category of townhouses, flats, units and other dwellings. All dwellings that are attached horizontally (side by side) to another dwelling unit are included in this category. A terraced house is included in this category, as is a minor dwelling or 'granny flat'.
years	The 12 months ending 31 December of the year referred to.

8.3 Appendix C: Methodology, data, statistics and assumptions used in this report

This report is built from two independent but complementary sources of information on national building and construction activity.

Forecast: Produced by BRANZ based on Stats NZ's gross fixed capital formation data series. The gross fixed capital formation measure includes all types of construction (whether a building consent is required or not), providing a common measure across the three fixed asset classes of:

- residential building
- non-residential building
- infrastructure construction.

Research: Pacifecon's construction project intentions database contains expected costs over time for non-residential and infrastructure projects. Information is collected by Pacifecon on pre-construction project intentions. It is an extensive list of non-residential and infrastructure intentions across New Zealand.

Forecasting methodology

The forecasting that provides the basis of this report was completed on 24 September 2020, based on the Stats NZ March 2020 release of 2019 gross fixed capital formation data and other relevant data.

The key variables used in the forecast were as follows:

- GDP growth is forecast to fall by about -4% for the year ending December 2020. This is then forecast to rise sharply by 6.5% for the year ending March 2022, before returning to the long-run average growth rate by mid-2023.
- The Official Cash Rate is forecast to be cut further to -0.5% by mid-2021. This rate is forecast to be maintained for just over a year, before incrementally increasing throughout the forecast period.
- Net migration is forecast to sit close to 0 for the next couple of years, before increasing to about 40,000 for the year ending 2024.

Residential methodology

The residential building sector forecasts in this report are produced by BRANZ. They are based on modelling of historical building consents and economic forecast indicators. This sector has much shorter lead times than the non-residential sector.

Key assumptions

- BRANZ has assumed a direct relationship between household formation and demand for new dwelling construction.
- BRANZ has assumed zero unsatisfied residential building demand at the 2013 Census. However, there is assumed to now be a housing shortfall.
- The net result is an average of 26,250[21] dwellings per annum through to 2025.
- An average of a nine-month time lag is assumed between the building consent issue and value of work completed.
- Value of work includes detached houses, multi-unit dwellings and additions and alterations to existing dwellings and is based on consent values multiplied by 1.22 to allow for variations after the consent has been issued and other costs included in the gross fixed capital formation measure. The multiplication factor is calculated from historical ratios of fixed capital formation/consent values.
- Historical consents are first published data, and there may be subsequent changes in some locations. Usually these revisions are minor.

21 This was 37,500 dwellings in the 2019 report.

Changes in residential methodology from the 2019 report

Assumptions used to forecast residential building fixed capital formation have changed from the 2019 report. Changes include:

- the distribution of work across quarterly seasons has been adjusted based on changes in previous seasonal distribution of work
- the input variables have changed significantly because of the COVID-19 pandemic
- we are no longer capping new dwelling consents based on anticipated industry capacity.

All non-residential building and infrastructure

The non-residential building and infrastructure forecasts are based on BRANZ forecasts and charted alongside researched project intentions data held by Pacifecon throughout the report.

Non-residential building methodology

BRANZ forecasts of non-residential buildings are based on forecasts of non-residential building consent values provided by Stats NZ. The consent values are multiplied by a factor of 1.08 for gross fixed capital formation using historical ratios between consents and gross fixed capital formation and allowing for an average of a 12-month time lag between building consent issue and value of work completed.

Ten categories of non-residential building consents are forecast based on the Stats NZ data. Single equation regression models have been developed for most of the categories.

Infrastructure methodology

BRANZ forecasts for infrastructure are based on modelling the historical trends for industry commissioning and ownership of assets and expected growth in the five main sectors of:

- mining: about 5% of other construction fixed capital formation
- electricity/gas/water sectors: 25%
- transport: 41%
- telecommunications: 10%
- other: 19%

Real growth is based on historical growth trends and planned work (for example, the Government Policy Statement on Land Transport Funding). Real growth in gross fixed capital formation for the five sectors is assumed to be -5% per year for mining, 1% for electricity/gas/water, 3% for transport, 4% for telecommunications and 2% for other infrastructure works.

Research data methodology

Pacifecon's anticipated projects

A dataset of over 11,500 researched future projects known to Pacifecon has been used in this report. The data is up to date as at 23 May 2020. Smoothed data as at 18 September 2020 has been used in this report.

The Pacifecon dataset of project values shows the value of all projects, smoothed across future quarters for the duration of the project (as far as this is known or estimated). Work on all high-value (over $50m) non-residential construction initiated since the beginning of 2011 and that is still in progress is also included. The dataset includes both non-residential building and infrastructure.

Pacifecon's refinement of the smoothing process

Pacifecon's data used in this report consists of projects that are at pre-construction stages, from the very earliest planning through to tendering. This real project activity data is collected and retained by Pacifecon.

The total number of projects reported by Pacifecon has increased from over 6,000 in the 2013 report to over 11,500 projects in the current report. When using researched project intentions to forecast activity, Pacifecon accounts for optimism bias. Not all projects in the planning process will progress to actual constructions at the intended value or proposed timeframes. To account for this optimism bias in the dataset, Pacifecon undertakes a smoothing process to prepare the data for the report.

Pacifecon has consistently refined its smoothing process by studying the highest-value projects to ascertain the most likely allocation of their value of work over time.

- First report (2013): projects over $100 million were individually scrutinised.
- Second report (2014): projects over $90 million were scrutinised.
- Third report (2015): projects over $75 million were scrutinised.
- Fourth report (2016): projects over $60 million were scrutinised.
- Fifth (2017), sixth (2018), seventh (2019) and current report (2020): projects over $50 million were scrutinised.

In some (but not all) cases for 2020, projects with values lower than $50m were examined individually.

The thousands of lower-value projects in the research data are smoothed as follows:

- $30m to <$50m projects – value of work is spread over 12 quarters.
- $5m to <$30m projects – value of work is spread over eight quarters.
- $1m to <$5m projects – value of work is allocated to four quarters.
- <$1m – value of work is allocated to two quarters.

8.4 Appendix D: Projects likely to start within the year valued over $100m

Table 8.4.1 Non-residential building projects likely to start within the year[22] valued at over $100m[23]

Region	Type	Project initiator
Auckland		
AIAL terminal integration phase 5	Commercial	Private
Supermarket	Commercial	Private
Waikato/Bay of Plenty		
Boutique vineyard village	Multi-category	Private
Wellington		
Offices	Commercial	Private

Source: Pacifecon

22 Year is the 12 months ending 31 March 2021.

23 Inclusion of a project does not mean it will proceed to the scale and timeframe indicated above. It is, however, the best available picture at 18 September 2020. Pacifecon's building and construction information is constantly updated.

Table 8.4.2 Infrastructure projects likely to start within the year[24] valued at over $100m[25]

Region	Type	Project initiator
Auckland		
North Auckland line upgrade	Transport	Central government
Vector 2020–21	Electricity/Gas	Private
Rail network upgrades	Transport	Central government
SH22 safety improvements – Drury to Paerata	Transport	Central government
Auckland Harbour Bridge – shared path	Transport	Local government
Papakura to Pukekohe rail electrification	Transport	Central government
Hingaia South subdivision	Subdivision	Private
Wiri to Quay Park rail line	Transport	Central government
Waikato/Bay of Plenty		
Waikato River Authority restoration	Water	Central government
Waikato and Upper North Island voltage management	Electricity/Gas	Private
PowerCo	Electricity/Gas	Private
Mt Messenger bypass	Transport	Central government
Peacocke Bridge	Transport	Local government
Wastewater reticulation network and treatment plans	Water	Local government
Wellington		
Road maintenance 2020–23	Transport	Local government
Otago		
Lake Hawea SHA	Subdivision	Private
QLDC 3 waters	Water	Local government
Dunedin CC sealed/unsealed road network maintenance	Transport	Local government
Rest of New Zealand		
Marlborough roads network outcomes	Transport	Central Government
PowerCo Taranaki	Electricity/Gas	Private
Te Ahu a Turanga – Manawatu Tararua highway	Transport	Central Government

Source: Pacifecon

24 Year is the 12 months ending 31 March 2021.

25 Inclusion of a project does not mean it will proceed to the scale and timeframe indicated above. It is, however, the best available picture at 18 September 2020. Pacifecon's building and construction information is constantly updated.

8.5 Appendix E: Forecast and known table

Table 8.5.1 Forecast and known data ($ billions) by region – annual totals[26]

	Actual		Forecast					
Residential	2018	2019	2020	2021	2022	2023	2024	**2025**
Auckland	8.8	9.2	8.0	8.4	7.6	6.5	6.5	6.5
Waikato/BoP	3.7	3.9	3.3	3.1	2.4	2.0	2.2	2.2
Wellington	1.8	1.9	1.7	1.5	1.1	0.9	0.9	0.9
Canterbury	3.6	3.8	3.0	2.9	1.9	1.5	1.6	1.6
Otago	1.5	1.6	1.3	1.2	0.6	0.6	0.7	0.7
Rest of NZ	3.3	3.4	2.9	2.9	2.1	1.8	2.0	2.0
TOTAL	22.8	23.7	**20.2**	**20.0**	**15.8**	**13.4**	**13.8**	**13.8**
Non-residential building								
Auckland	3.7	3.9	3.3	2.5	2.4	2.9	3.2	3.4
Waikato/BoP	1.2	1.5	1.2	1.0	0.9	1.1	1.2	1.2
Wellington	0.7	0.6	0.8	0.5	0.4	0.4	0.4	0.4
Canterbury	2.0	2.2	1.5	1.1	0.9	1.0	1.0	1.0
Otago	0.4	0.5	0.5	0.3	0.3	0.3	0.3	0.4
Rest of NZ	1.0	1.3	1.0	0.8	0.8	0.9	1.0	1.0
TOTAL	9.1	10.0	**8.2**	**6.2**	**5.8**	**6.6**	**7.0**	**7.4**
Infrastructure								
Auckland	3.5	4.0	3.8	3.8	4.0	4.1	4.4	4.5
Waikato/BoP	1.2	1.4	1.3	1.4	1.7	1.7	2.1	2.1
Wellington	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Canterbury	0.8	0.9	1.0	1.0	0.7	0.8	0.4	0.5
Otago	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7
Rest of NZ	1.7	1.9	1.7	1.8	1.7	1.8	1.7	1.7
TOTAL	8.4	9.5	**9.2**	**9.3**	**9.5**	**9.7**	**9.9**	**10.1**
All construction								
Auckland	16.0	17.1	15.0	14.7	14.1	13.5	14.0	14.3
Waikato/BoP	6.1	6.7	5.8	5.5	5.0	4.8	5.4	5.5
Wellington	3.1	3.1	3.1	2.8	2.2	2.0	2.0	2.0
Canterbury	6.5	7.0	5.5	5.1	3.6	3.3	3.0	3.0
Otago	2.5	2.7	2.4	2.1	1.6	1.6	1.7	1.8
Rest of NZ	6.0	6.6	5.6	5.5	4.6	4.5	4.6	4.7
TOTAL	40.2	43.2	**37.6**	**35.6**	**31.1**	**29.7**	**30.8**	**31.4**
Researched non-residential building								
Auckland	2.6	3.7	2.8	3.7	3.6	2.7	2.2	1.9
Waikato/BoP	1.4	1.3	1.4	1.7	1.4	0.9	0.7	0.6
Wellington	0.7	0.8	0.7	0.9	0.7	0.3	0.2	0.1
Canterbury	1.5	1.5	1.1	1.4	1.3	1.0	0.7	0.6
Otago	0.4	0.5	0.5	0.7	0.5	0.4	0.3	0.3
Rest of NZ	0.9	1.5	1.1	1.8	1.5	0.8	0.5	0.4
TOTAL	7.4	9.3	**7.6**	**10.3**	**9.0**	**6.1**	**4.6**	**4.0**
Researched infrastructure								
Auckland	3.0	3.8	3.8	3.8	3.9	3.5	3.0	2.8
Waikato/BoP	1.2	1.6	1.4	1.9	1.7	1.5	1.3	1.1
Wellington	0.6	0.7	0.7	0.8	0.5	0.3	0.2	0.3
Canterbury	0.7	0.6	1.1	1.0	0.9	0.4	0.3	0.2
Otago	0.4	0.6	0.5	0.8	0.7	0.5	0.3	0.2
Rest of NZ	1.3	2.0	1.7	1.9	1.4	0.9	0.9	0.8
TOTAL	7.1	9.2	**9.2**	**10.2**	**9.1**	**7.1**	**6.1**	**5.5**

Source: BRANZ/Pacifecon

26 Any differences between figures within Appendix E and other tables and charts in this report are due to rounding to two significant figures.

8.6 Appendix F: Residential dwelling consents actual and forecast data table

Table 8.6.1 Residential dwelling numbers actual consented and forecast, by region – annual totals[27]

	Actual		Forecast					
Detached	2018	2019	2020	2021	2022	2023	2024	2025
Auckland	6,398	6,835	6,600	6,700	6,500	5,900	6,100	5,400
Waikato/BoP	4,103	4,381	4,300	3,300	2,700	2,900	3,200	3,100
Wellington	1,595	1,540	1,500	1,100	800	800	900	900
Canterbury	3,422	3,759	4,100	2,700	2,000	2,000	2,200	2,200
Otago	1,473	1,343	1,200	600	500	800	900	900
Rest of NZ	4,126	4,410	4,200	3,100	2,400	2,700	3,100	3,300
TOTAL	21,117	22,268	**21,900**	**17,500**	**14,900**	**15,100**	**16,400**	**15,800**
Multi-units								
Auckland	6,464	8,319	7,500	6,700	4,300	4,800	6,000	6,700
Waikato/BoP	1,635	2,016	1,500	1,200	900	1,000	1,200	1,300
Wellington	1,136	1,680	1,300	870	600	630	730	740
Canterbury	1,347	1,549	1,800	900	760	840	950	950
Otago	528	943	900	360	200	220	220	220
Rest of NZ	761	851	1,100	470	340	410	500	290
TOTAL	11,871	15,358	**14,100**	**10,500**	**7,100**	**7,900**	**9,600**	**10,200**
All dwellings								
Auckland	12,862	15,154	14,100	13,400	10,800	10,700	12,100	12,100
Waikato/BoP	5,738	6,397	5,800	4,500	3,600	3,900	4,400	4,400
Wellington	2,731	3,220	2,800	1,970	1,400	1,430	1,630	1,640
Canterbury	4,769	5,308	5,900	3,600	2,760	2,840	3,150	3,150
Otago	2,001	2,286	2,100	960	700	1,020	1,120	1,120
Rest of NZ	4,887	5,261	5,300	3,570	2,740	3,110	3,600	3,590
TOTAL	32,988	37,626	**36,000**	**28,000**	**22,000**	**23,000**	**26,000**	**26,000**

Source: BRANZ/Pacifecon

27 Any differences between figures within Appendix F and other tables and charts in this report are due to rounding to the nearest 100.