DUNEDIN CITY COUNCIL | kaunihera a-rohe o Ōtepoti

MINUTE EXTRACT FROM THE NON-PUBLIC SECTION OF THE ECONOMIC DEVELOPMENT COMMITTEE MEETING DATED 19 OCTOBER 2020

C1 OTAGO CONSTRUCTION LABOUR FORECASTING

A report from Enterprise Dunedin provided an update on activity jointly led by Enterprise Dunedin, the Ministry of Social Development (MSD) and Aukaha to forecast construction labour workforce demand and skills needs across Otago.

The Economic Development Programme Manager (Fraser Liggett), the Business Relationship Advisor (Des Adamson) , the Economic Advisor – Coastal Otago (Annabelle Cullinane) and the Regional Labour Market Advisor, Ministry of Social Development (Deb Sutton) spoke to the report and responded to questions.

Moved (Cr Chris Staynes/Cr David Benson-Pope):

That the Committee:

Notes the Otago Construction Labour Forecast findings prepared by the Building Construction Industry Training Organisation (BCITO), Infometrics and MartinJenkins.

Motion carried (ED/2020/001)

Notice of Meeting:

I hereby give notice that an ordinary meeting of the Economic Development Committee will be held on:

Date:	**Monday 19 October 2020**
Time:	**1.30 pm (or at the conclusion of the previous meeting, whichever is later)**
Venue:	**Edinburgh Room, Municipal Chambers, The Octagon, Dunedin**

Sandy Graham
Chief Executive Officer

Economic Development Committee

CONFIDENTIAL AGENDA

MEMBERSHIP

Chairperson	Cr Chris Staynes	
Deputy Chairperson	Cr Rachel Elder	Cr Andrew Whiley
Members	Cr Sophie Barker	Cr David Benson-Pope
	Cr Christine Garey	Cr Doug Hall
	Mayor Aaron Hawkins	Cr Carmen Houlahan
	Cr Marie Laufiso	Cr Mike Lord
	Cr Jim O'Malley	Cr Jules Radich
	Cr Lee Vandervis	Cr Steve Walker
Senior Officer	John Christie, Director Enterprise Dunedin	
Governance Support Officer	Wendy Collard	

Wendy Collard
Governance Support Officer

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Note: *Reports and recommendations contained in this agenda are not to be considered as Council policy until adopted.*

ITEM TABLE OF CONTENTS **PAGE**

DECLARATIONS OF INTEREST

Members are reminded of the need to stand aside from decision-making when a conflict arises between their role as a representative and any private or other external interest they might have.

PART A REPORTS

OTAGO CONSTRUCTION LABOUR FORECASTING

Department: Enterprise Dunedin

REASONS FOR CONFIDENTIALITY

Grounds:	S48(1)(a) - The public conduct of the part of the meeting would be likely to result in the disclosure of information for which good reason for withholding exists under section 7.
Reason:	S7(2)(b)(ii) - The withholding of the information is necessary to protect information where the making available of the information would be likely unreasonably to prejudice the commercial position of the person who supplied or who is the subject of the information. S7(2)(i) - The withholding of the information is necessary to enable the local authority to carry on, without prejudice or disadvantage, negotiations (including commercial and industrial negotiations).

EXECUTIVE SUMMARY

1 The purpose of this report is to update the Economic Development Committee on activity jointly led by Enterprise Dunedin, the Ministry of Social Development (MSD) and Aukaha to forecast construction labour workforce demand and skills needs across Otago.

2 The work was funded through a $250K grant via Provincial Growth Fund (PGF). The Building Construction Industry Training Organisation (BCITO), Infometrics and MartinJenkins were contracted to deliver the work which resulted in the development of:

a) A final report and summary documentation setting out proposed construction projects; and

b) A flexible model (Construction Workforce Forecasting tool) which can be updated to take account of changes in the scale and timing of projects.

3 The Post COVID-19 and Executive Summary are attached to this report. The full report is available should Councillors wish a copy.

4 The results of the study and ongoing management of the Construction Workforce Forecasting tool will inform decisions and development of proposals to support industry and employees in the construction sector.

5 The outputs from the Construction Workforce Forecasting tool will be shared with institutions including Workforce Central Dunedin (WFCD), Grow Dunedin Partnership (GDP), Otago Councils, Otago Polytechnic/ New Zealand Institute of Skills Technology (NZIST), recently created Regional Skill Leadership Groups and Tertiary Education Commission (TEC).

RECOMMENDATIONS

That the Committee:

a) **Notes** the Otago Construction Labour Forecast findings prepared by the Building Construction Industry Training Organisation (BCITO), Infometrics and MartinJenkins.

BACKGROUND

6 In July 2019 the Ministry of Social Development, Enterprise Dunedin and Aukaha submitted a proposal to the PGF to support research into planned and proposed construction projects and industry workforce, skills and training demands across the Otago region (including Queenstown Lakes, Central Otago, Clutha, Dunedin and Waitaki Councils).

7 The intention was:

a) To create visibility over the skills and trades required by industry over the next 15 years and any potential demand, deficits, pressures and needs

b) Develop a flexible model responsive to changes in assumptions in industry demand over the 15-year period; and

c) Consider and take account of separate supply side information which could align industry need with training provision, projects and measures to support pathways to employment.

DISCUSSION

Initial Analysis March 2020

8 Initial analysis of the major construction projects in the Otago region saw the additional demand for labour to boost by between 2,300 to 3,600 workers between 2020 and 2025. The two most significant areas of demand were Dunedin and Queenstown Lakes, with the timing and occupational stresses varying between these two areas.

9 Occupations with growth trends:

The forecast showed that employment in the occupations of electricians, plumbers, floor finishes, wall, floor and roof tilers, bricklayers and plant operators are only moderately affected by changes in construction activity in the Otago Region. This is because demand for these workers have steadily increased and expected to rise as it is correlated to the size of the population and building stock.

10 Occupations with moderate responsiveness to major projects:

Demand for occupations in project builders, excavators and drainlayers is expected to be more responsive to changes in construction activity than occupations with growth trends. For these occupations, there is consistently a baseline level of employment that can meet some additional demand for work before the workforce capacity is strained and additional workers are needed.

11 Occupations where demand pressures are likely to be felt most acutely are as carpenters, project managers, solid plasters, building associates, landscape gardeners, quantity surveyors, scaffolders, concreters, fencers, electrical line mechanics, fibrous plasterers, telecommunications technicians, drillers, air conditioning and refrigeration mechanics. The forecast shows that these occupations will be highly exposed to the swings in construction activity that will directly relate to the change in demand for workers.

12 The analysis indicated that more than 90% of planned construction project funding in Coastal Otago is publicly driven. A breakdown over the 15-year period indicates that the new Dunedin hospital comprises 42% of this with infrastructure (28%) and education making up the remaining balance (21%). In contrast, Inland Otago almost 90% of funding involves private or commercial investment.

13 COVID-19 is not expected to make a significant difference to the overall pre-COVID-19 underlying demand for construction workers in Coastal Otago, which means there will still be significant resourcing pressures associated with construction of the new hospital in Dunedin.

August 2020 COVID-19 Update

14 BCITO and Infometrics provided an updated view of the Otago Construction Workforce and repositioned the data, findings, issues and opportunities in the context of Covid-19 (Post COVID-19 Update and Executive Summary).

15 The analysis took account of economic and commercial impacts on projects and Government Crown Infrastructure Fund stimulus package and indicated:

a) Just under $10B worth of projects across Otago (with a value of $20M or greater) over the next 15 years (as of July 2020) of which:

- $3.3B is located in Coastal Otago (almost entirely in Dunedin) – 90% of which was driven by the public sector; and
- $6.4B is located in inland Otago primarily Queenstown, Wanaka and Cromwell - 90% of which is funded through private and commercial investment.

b) Demand for between 1,500 and 2,500 construction workers across Otago.

16 In response to the rapidly unfolding Covid-19 situation, the updated project presents two forecasts for the Otago Region. The first being a Pre-COVID status quo, and the second being 'worst case' scenario. The significant variations are experienced in the Inland Otago scenarios. It is expected that the reality will fall somewhere between these two scenarios.

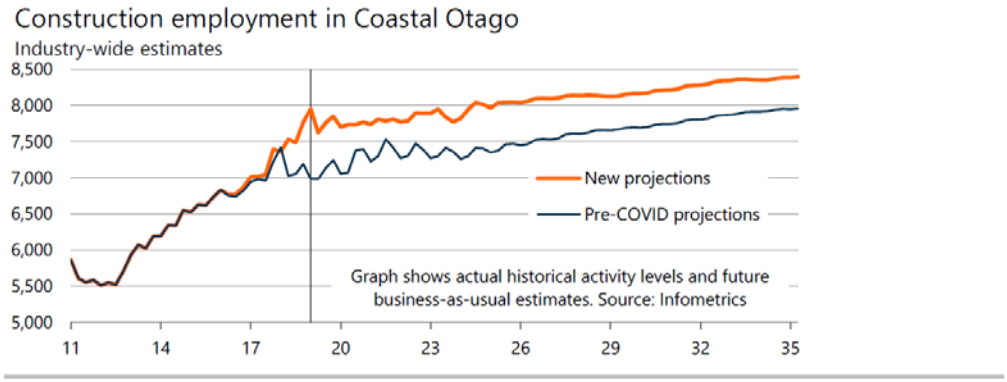
17 The updated Post COVID-19 Update and Executive Summary notes that the pandemic is set to be a catalyst for a quicker and possibly more pronounced drop off in construction activity than would otherwise have occurred. However, over the medium term it is likely to have limited implications for business as usual activity levels across the region.

18 The forecast has indicated a greater certainty that projects will continue as planned in Coastal Otago because of the low risk associated with publicly funded projects, while private investment projects in Inland Otago have a higher risk of commercial investors delaying or changing plans because of the economic impacts of COVID-19.

Coastal Otago

19 Overall the projected track for levels of construction employment in Coastal Otago is expected to follow a similar pattern to Pre-COVID projections expect for an anticipated change of 7% increase in employment by March 2022, between 5%-9% increase between 2022 and 2025 and between 5-6% in the longer period.

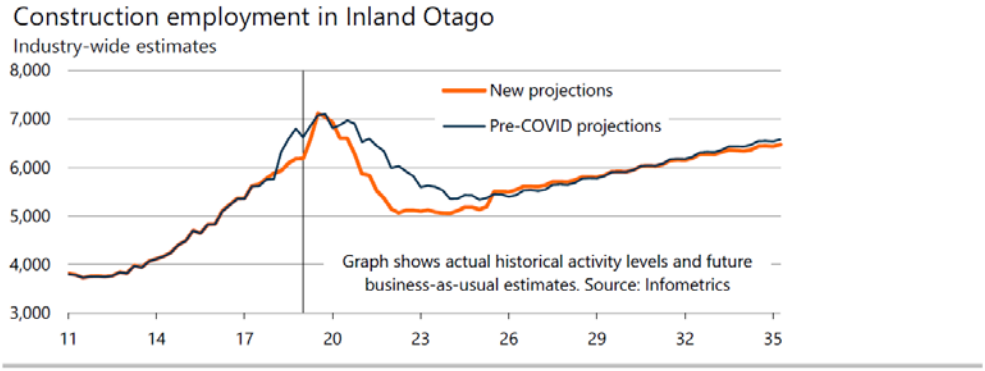
Graph 3.



Inland Otago

20 The impact of COVID-19 on construction employment in Inland Otago is expected to be more substantial. Construction employment in Inland Otago is projected to decline 23% over the two years to June 2022.

Graph 4.



Use and Ongoing Updates

21 The analysis has identified four focus areas with the biggest potential to help meet demand for construction labour; attracting workers, supporting workers, supporting employers and accommodation.

22 Further work will be undertaken through project partners including Aukaha and the MSD on initiatives to support leaners, employees and industry. Engagement will also be undertaken with GDP, the ORED working group, and the TEC and WFCD.

23 In addition to maintaining the Construction Workforce Forecasting tool further updates from BCITO are planned to take place in October and November 2020.

Great Dunedin Brainstorm

24 A related proposal to support women into construction employment and entrepreneurial opportunities was identified and supported by GDP during the Great Dunedin Brainstorm. The proposal (related to the theme of attracting and supporting workers) has been discussed with MSD and represents one early possible initiative arising from the BCITO research.

OPTIONS

25 There are no options.

NEXT STEPS

26 Given its regional focus, the report will be shared in confidence with the ORED Working Group who may also present the findings to their individual Councils. The report will also be shared with the Otago Polytechnic and interim regional skills leadership Group and Tertiary Education Commission in order to inform and assist decision making around vocational education training needs and opportunities. The findings will also be shared internally with DCC staff in assets and procurement.

27 Further work will be progressed on opportunities through the proposed second round of the PGF in conjunction with original project team (composed of MSD and Aukaha) and WFCD. The intention is to identify opportunities (which cannot be addressed through mainstream Government funding) to progress the recommendations including construction labour attracting workers, supporting workers, supporting employers and accommodation.

Signatories

Author:	Annabelle Cullinane - Economic Advisor - Coastal Fraser Liggett - Economic Development Programme Manager
Authoriser:	John Christie - Director Enterprise Dunedin

Attachments

SUMMARY OF CONSIDERATIONS

Fit with purpose of Local Government

This decision promotes the economic, social and cultural well-being of communities in the present and for the future.

Fit with strategic framework

	Contributes	Detracts	Not applicable
Social Wellbeing Strategy	☒	☐	☐
Economic Development Strategy	☒	☐	☐
Environment Strategy	☐	☐	☒
Arts and Culture Strategy	☐	☐	☒
3 Waters Strategy	☐	☐	☒
Spatial Plan	☐	☐	☒
Integrated Transport Strategy	☐	☐	☒
Parks and Recreation Strategy	☐	☐	☒
Other strategic projects/policies/plans	☒	☐	☐

The results of the analysis and Construction Workforce Forecasting tool will contribute and inform activities proposed under the Otago Regional Economic Development Framework and Workforce Central Dunedin.

Māori Impact Statement

Aukaha in conjunction with DCC and MSD are joint leads on the Otago Construction Labour Forecasting Project.

Sustainability

The research and Construction Workforce Forecasting tool will inform initiatives that will support economic sustainability (through building the skills base) and social sustainability (through promoting a good work/life balance and full employment).

LTP/Annual Plan / Financial Strategy /Infrastructure Strategy

There are no implications.

Financial considerations

There are no financial implications.

Significance

This decision is considered low in terms of the Council's Significance and Engagement Policy.

Engagement – external

The Ministry of Social Development, Aukaha, Workforce Central Dunedin as well as industry, economic development strategy partners and Otago Regional Economic Development working group have been engaged on the analysis.

Engagement - internal

There has been no internal engagement.

Risks: Legal / Health and Safety etc.

There are no health and safety implications.

SUMMARY OF CONSIDERATIONS
Conflict of Interest There are no conflicts of interest.
Community Boards There are no implications for Community Boards.

Otago Construction Labour Forecasting Project – Inland Otago Edition *August 2020 update*

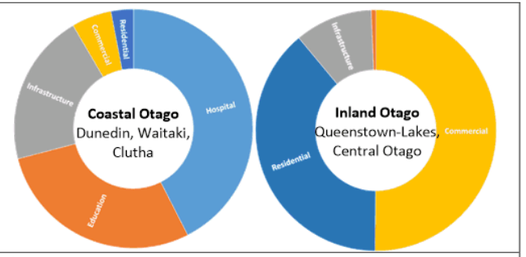
Industry Snapshot, projects and regions

This report juggles two conflicting views of the future and two different drivers for construction across the Otago region and Inland Otago specifically.

The volume in dollar value and number of projects on the books between 2020 and the 2025 is extremely high this is shown in the employment demand graphs below left. But economic forecasting would suggest the numbers will fall because of the regional impacts on tourism etc. this is shown in the Contracted Project Scenario graph below left.

Prior to COVID-19 the forecasting project was encouraged to reflect the numbers as it saw them, in the project based forecast we have continued to include projects in planning or under construction until we are advised otherwise. Local business confidence continues to support these figures and we have independently verified the project list with Pacificon Ltd. We will continue to monitor changes and update data in September and December and would expect the two views to start to come together over this period.

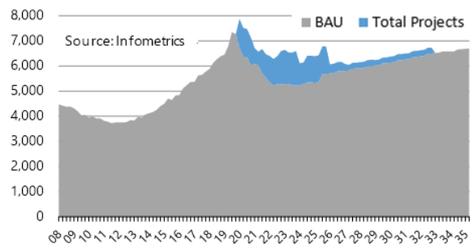
The drivers and funding sources of construction in the Otago region differ considerably between Inland Otago which is 85% Residential and Commercial verses Coastal Otago where the forecast construction work is 90% Infrastructure, Education and Hospital related.



Demand for labour

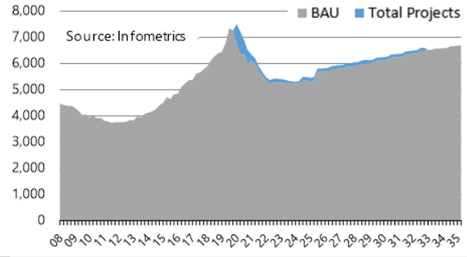
The current project based demand represents an increase of between 17% and 28% over business-as-usual employment.

Forecast Project based construction employment in Inland Otago



Contracted Project Scenario construction employment in Inland Otago

Demand would drop under the Contracted Project Scenario resulting in a surplus in the labour force however retirement and replacement forecasts run at approximately 600 annually for the next five years.



Opportunities

The natural supply of labour in Otago has not met the demand, particularly in Inland Otago with migrant workers filling the gap in recent years.

With the likely volatility solutions will be need to ensure that there are enough workers, with the right skills, to deliver projects as planned.

The theme that has emerged most strongly through all opportunities is connectedness. This includes connections between people, businesses, agencies, programmes, and even physically through transport and infrastructure.

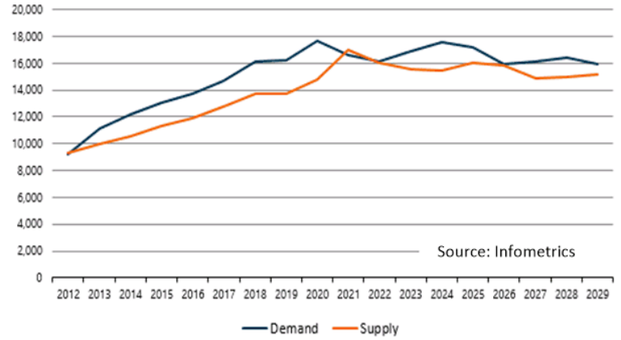
The project identified four focus areas with the biggest potential to help meet the demand for construction labour. These were:

- Attracting workers
- Supporting Employers
- Supporting workers
- Accommodation

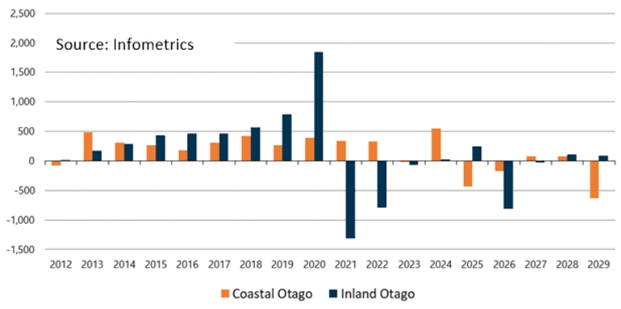
Forecast Construction Labour force Supply and demand pre COVID-19

Supply and demand of Construction workers in Otago

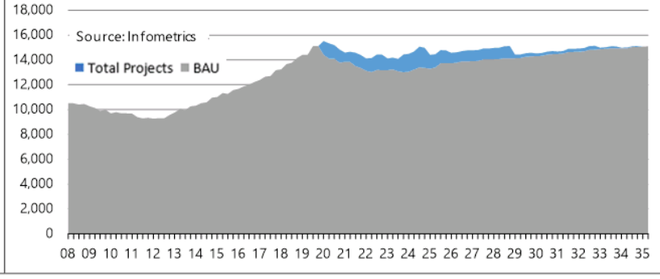
Projected employment supply-demand balance in Otago Region



Projected annual growth (decline) in employment by sub-region



Projected construction employment in Otago Region

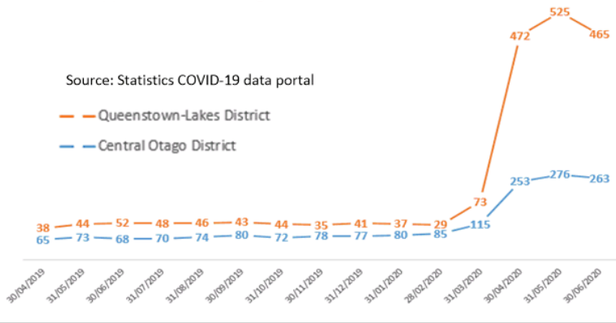


Supply of Labour

There are seven significant labour supply channels for the Otago construction sector. In order of their contribution to construction labour supply in Otago in 2018 these are:

1. Career changers (50%)
2. Migrants (15%)
3. Tertiary enrolments (10%)
4. New Zealanders returning from a prolonged time overseas (6%)
5. Secondary school leavers (5.5%)
6. Beneficiaries (*historical 2.2% but a significant recent shift in numbers*)
7. Other (11%) including Corrections and people with incomplete data

Jobseeker support in Central Otago and Queenstown-Lakes Districts



Next Steps

The coming months and years will be critical to putting in place the Construction workforce needed to meet the level of work planned in Otago.

It is important that there is a plan put in place for progressing actions identified through this project. Our recommendations for next steps are:

1. Establish and maintain a regional group with a focus on construction workforce needs.
2. Build on the connections made through this project to put in place a network of anyone interested or invested in construction employment and training in the region.
3. Identify a short list of lower cost projects that will have short term impact on meeting construction workforce demand and put these in place.
4. Scope and seek funding and buy in for a short list of bigger projects that will have longer-term impacts on meeting construction workforce demand.
5. Undertake further research or investigation about the construction workforce in Otago.

Otago Construction Labour Forecasting Project – Coastal Otago Edition *August 2020 update*

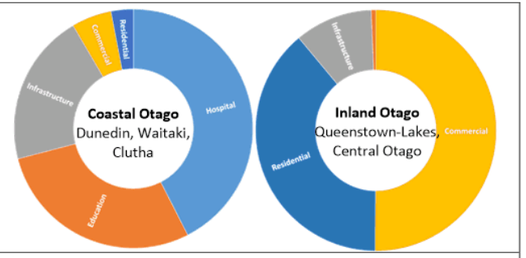
Industry Snapshot, projects and regions

This report juggles two conflicting views of the future and two different drivers for construction across the Otago region and Inland Otago specifically.

The volume in dollar value and number of projects on the books between 2020 and the 2025 is extremely high this is shown in the employment demand graphs below left.
But economic forecasting would suggest the numbers will fall in Inland Otago because of the regional impacts on tourism etc. this is shown in the supply & demand graph below middle.

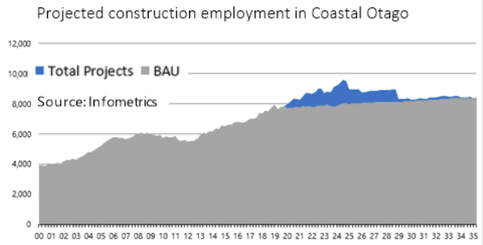
Prior to COVID-19 the forecasting project was encouraged to reflect the numbers as it saw them, in the project based forecast we have continued to include projects in planning or under construction until we are advised otherwise. Local business confidence continues to support these figures and we have independently verified the project list with Pacificon Ltd. We will continue to monitor changes and update data in September and December and would expect the two views to start to come together over this period.

The drivers and funding sources of construction in the Otago region differ considerably between Inland Otago which is 85% Residential and Commercial verses Coastal Otago where the forecast construction work is 90% Infrastructure, Education and Hospital related. The difference in drivers has meant the standalone Coastal Otago forecast remains unchanged.

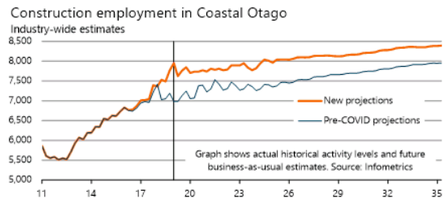


Demand for labour

At its peak, this work, in combination with other major projects in the City, could boost demand for workers in the construction industry by more than 1,500 people



While Demand may be expected to drop even the alternate economic forecast still has the sector requiring nearly 1,200 people to fill new or replacement roles across the Otago region.



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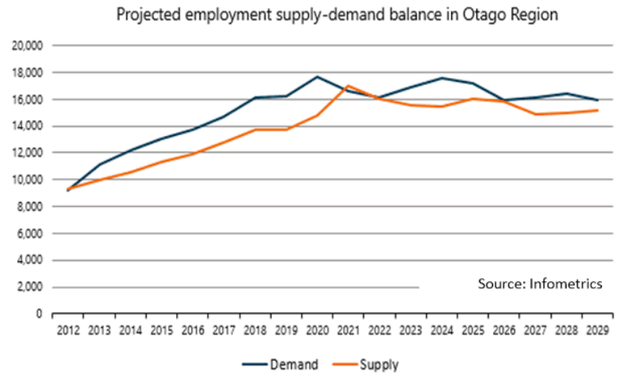
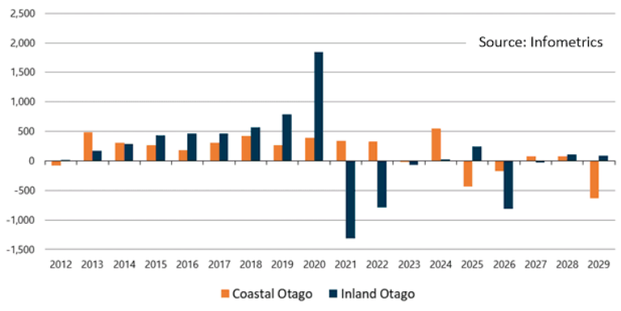
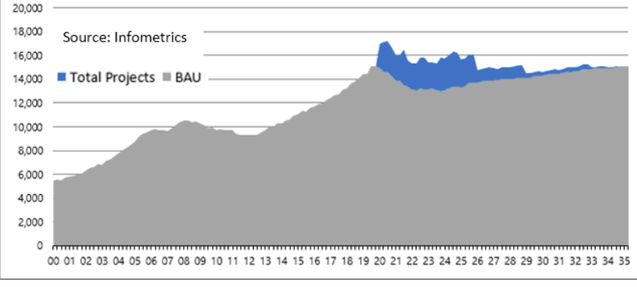


Projected annual growth (decline) in employment by sub-region



Projected construction employment in Otago Region



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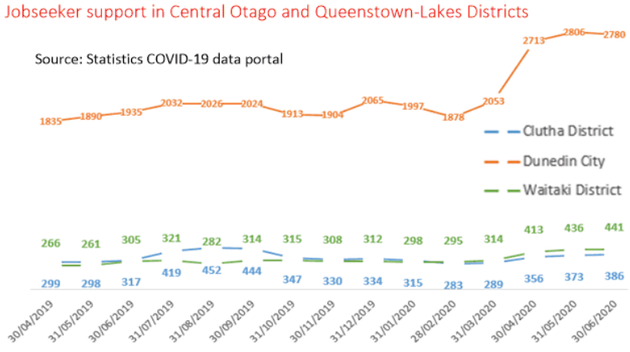

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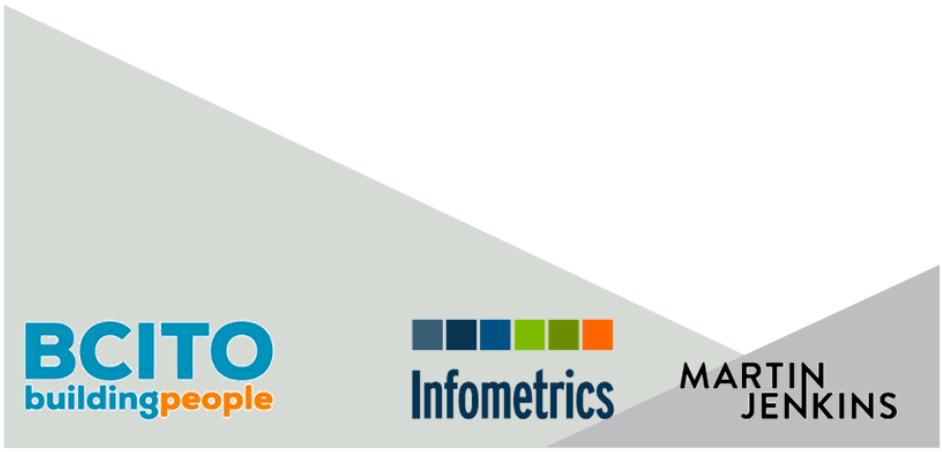
Otago Construction Labour Forecasting

Post COVID-19 Update and Executive Summary

July 2020



COVID-19 Update

The core information in this report was researched and written in the six months prior to the impact of COVID-19 being fully felt in New Zealand. While much of information in the original draft, completed as New Zealand went into lockdown, remains highly valuable in managing the impact of COVID-19 on the Otago region, the activity and labour forecasts contained in the March version of the report have been reviewed and additional information added relating to the construction labour market in July, as we look to the future and our new reality.

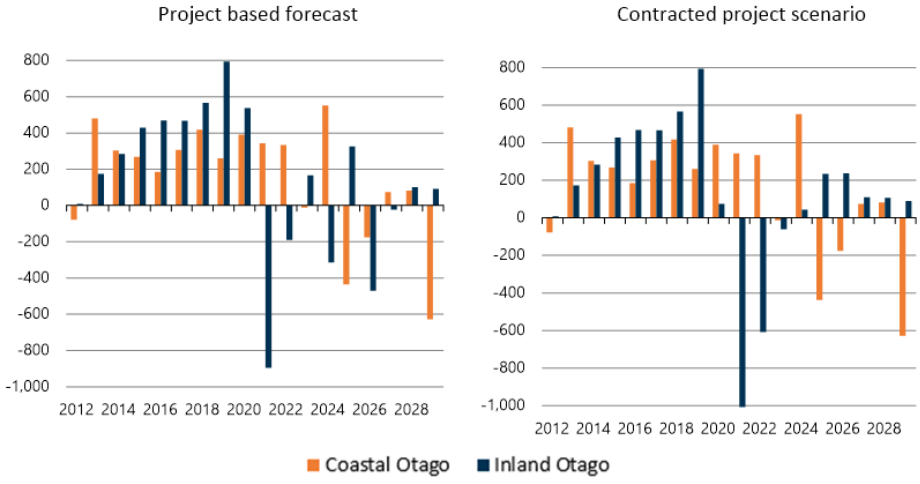
As part of its initial response to the rapidly unfolding COVID-19 situation, Infometrics updated its employment forecasts for the construction industry in late April and early May. Those forecasts were prepared based on analysis of the labour resourcing decisions that businesses were expected to make across the economy.

Since those forecasts were prepared, the positive public health outcomes and relatively quick return to Alert Level 1 have raised hopes that the economic ramifications of the pandemic might not be as impactful as initially feared. On-the-ground discussions with people in the construction industry in Otago, and indeed across the country, also suggest that the pipeline of work remains intact for now, and that job losses in the short term will be limited.

This sentiment helps explain the divergence between the employment projections in this report and the more negative forecasts previously published in Infometrics' Regional and Sector profiles. Nevertheless, there is still potential for construction activity to soften and while many projects have not been publically cancelled, there is concern that in Inland Otago especially there are a number of privately funded projects which will not proceed as forecast. The cancellation of several major projects in the region would reduce the employment projections in the demand-side modelling that Infometrics has undertaken for this report, bringing the figures more in line with Infometrics forecasts from May.

By way of an example, there are 14 hotel projects within the projects list of 123 major projects across Coastal and Inland Otago. If all of these were to be cancelled there would be a reduction in labour demand of approximately 1,000 trades people per annum, equal to the peak forecast of the New Dunedin Hospital project. It is unlikely all projects will be cancelled as some are nearing completion while others may be delayed or put on hold. Rather than try to pick which project will and will not proceed and to help visualise the variation, the project presents two forecasts for the Otago Region with significant variations in the Inland Otago scenarios.

Graph 1. Projected annual growth (decline) in employment by sub region



Economic overview

The COVID-19 pandemic and lockdown have had significant effects on employment and the economic outlook. Tourism, international education, and hospitality have been the most heavily affected sectors, with border closures and restrictions on people's movements substantially reducing businesses' revenue and undermining profitability. However, the effects of the pandemic have not been limited to these sectors, and the lockdown and its aftermath have seen a swathe of job losses throughout the economy.

Business confidence in the construction sector across both Coastal and Inland Otago is generally optimistic with most builders still having six months or more of work ahead of them. This is reflected in BCITO trainee numbers in Otago which increased very slightly (1.1%) since 1 March (just before COVID 19) compared with 1 July. This is driven by decreases in Central Otago (7.7%) and Queenstown-Lakes (2.7%) offset by an increase in Dunedin City (4.2%).

Business confidence however, is not universal across all sectors of the economy. In May 2020 there were 109,400 people in employment in Otago. This is about 2,400 (2.1%) fewer people than in March 2020, the last month of pre-COVID employment.

The number of people on a Jobseeker benefit in Otago also increased from 3,900 in mid-March 2020 to 5,700 in mid-June 2020, an increase of 1,800 or 46%. The percentage increase in Jobseeker benefits is particularly high in Inland Otago, especially in Queenstown-Lakes where the number of jobseekers increased from 73 in March 2020 to 525 in May 2020, an increase of more than 600%.

Effect on construction

Construction activity is highly reliant on confidence across a range of areas: lenders, developers, prospective owners or tenants, and households. A lack of confidence in each of these areas will reduce residential and/or non-residential construction over the next 1-2 years, at least:

- Banks are concerned about falling property values and an increase in bad loans, making finance for property purchases and construction much more difficult to obtain;
- Developers are worried about the potential for falling property prices and reduced demand resulting from slower population growth and other weaker macroeconomic drivers such as employment and spending activity;
- Prospective owners or tenants are concerned about business cashflow and are reluctant to commit to investment or other major business decisions; and
- Lower consumer confidence and job security have reduced households' willingness to spend.

Against this backdrop, prospects for residential and non-residential construction activity are weaker. Infometrics projections of business-as-usual (BAU) levels of construction work (that were provided in the initial report on the outlook for construction workers and skills in Otago) showed that, in general, activity was expected to weaken as demand retreated from its cyclical highs in 2019/20. This outlook was particularly true for Inland Otago, where residential activity appeared to be well in excess of what could be justified by population growth.

The COVID-19 pandemic is expected to have a more significant effect on the likelihood of some major projects identified in our previous work being deferred or cancelled entirely.

- The situation will be particularly critical for accommodation building, with a substantial and sustained decline in tourist numbers and activity devastating the business case for any new facilities during 2020 and 2021.
- Demand for retail space is likely to trend lower given weaker domestic and tourist spending as well as the accelerated shift towards online shopping that was encouraged by the lockdown. Job losses and the potential for an increase in the prevalence of working from home could also have medium-term implications for office space demand.

- Unlike residential and non-residential activity, infrastructure work is likely to be stronger over the next five years as the government looks to stimulate the economic recovery. To date, the government has allocated $3b of funding for "shovel-ready" projects that can be brought forward to help accelerate growth, inviting applications from district and regional councils, iwi authorities, NGOs, and the private sector. Although the list of recommended projects has yet to be released by either the government or Crown Infrastructure Partners, it is believed that almost 2,000 projects have been submitted, totalling $136b.

  The $3b of funding for shovel-ready projects comes on top of the government's $12b NZ Upgrade Programme that was detailed in January this year. As part of the process of accelerating infrastructure spending, the government has also moved to streamline approval for infrastructure activity by enabling specific projects to bypass the usual resource consent process over the next two years.

In conclusion, the COVID-19 pandemic is set to be the catalyst for a quicker, and possibly more pronounced, drop-off in construction activity than would otherwise have occurred. However, over the medium term, it is likely to have limited implications for BAU activity levels.

Other changes to input data

While preparing this update in response to the COVID-19 pandemic, we have also taken the opportunity to include new and revised figures for several data series. These updates include building consent data to the March 2020 quarter, amended estimates of employment up to March 2019, and revised infrastructure estimates at both a national and regional level.

In most cases, the effects of these updated figures on our demand projections is relatively minor. However, there are a few specific instances where the changes warrant a comment.

Construction employment levels in **Clutha** are significantly higher in 2018 and 2019 than indicated by previous estimates. In broad terms, these revisions have not altered our forecasts of future changes in demand for construction workers in Clutha, but the higher starting point means that our projected levels of worker demand over the next few years are also higher.

Residential consent numbers in **Queenstown-Lakes, Dunedin**, and **Waitaki** in recent quarters have been stronger than our previous BAU track had suggested. These consents imply greater momentum in residential activity and additional demand pressures for workers in the near-term, notwithstanding the likely negative effects of COVID-19 on activity throughout the remainder of 2020 and 2021.

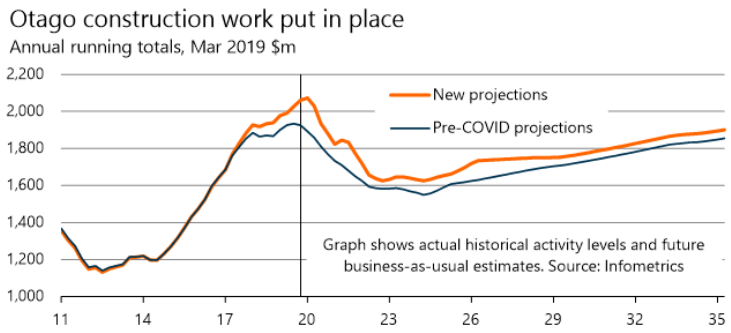
Significantly higher estimates of **infrastructure** activity by Statistics NZ from 2017 onwards have flowed through into increased BAU levels of infrastructure work over the medium term. This change has occurred because, in part, our future BAU infrastructure estimates rely on the historical relationship between activity and population growth. Nevertheless, this upward revision is consistent with the increased government focus on infrastructure investment in response to the current recession.

Outlook for activity and employment

Reflecting the changes outlined above, the starting point for total construction activity across Otago in the year to December 2019 is 7.1% above the BAU estimates we previously provided. Much of this upward revision is due to higher estimated levels of infrastructure activity, with smaller upwards shifts in residential and non-residential building work.

Throughout the 2020-2025 period, our revised estimates of total BAU activity levels across Otago are between 2.8% and 9.5% higher than our previous estimates (see Graph 2). This change reflects sustained higher levels of infrastructure activity, due to the combination of the higher starting point as well as the government's focus on using infrastructure spending as a means of stimulating the economy's post-COVID recovery.

Graph 2.



Apart from a post-lockdown catch-up in 2020/21, we estimate that BAU levels of residential construction will be slightly lower throughout the next five years. The BAU outlook for non-residential activity is little changed, apart from the current pipeline of consented projects being worked through over the next 18 months. We note that the economic downturn presents downside risks to non-residential activity, with less favourable business conditions increasing the possibility of postponement or cancellation for projects that have already been consented.

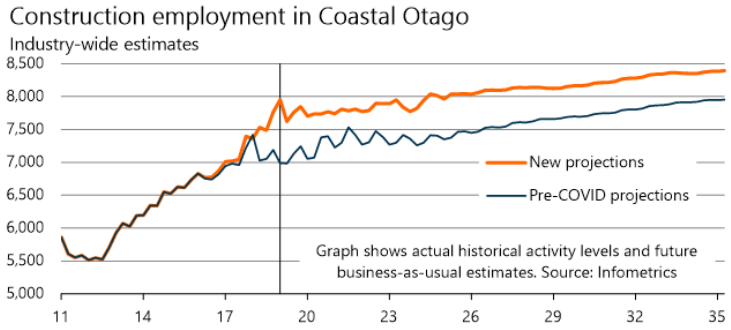
Beyond 2025, our BAU projections for construction work have been revised up slightly due to higher baseline levels of infrastructure activity.

Coastal Otago

In broad terms, the projected track for BAU levels of construction employment in Coastal Otago follows a similar pattern to our pre-COVID projections, except with total employment at a higher level. This level shift reflects our revised understanding of the construction workforce in Coastal Otago during 2018/19, which implies that construction employment in this part of the region is about 9% higher than we had previously estimated.

The economic downturn makes it unlikely that all these additional workers will be retained in the near-term, although our new BAU projections for construction employment by March 2022 are still almost 7% higher than previous estimates (see Graph 3). Between 2022 and 2025, our projections of BAU employment in Coastal Otago range between 5% and 9% above our previous estimates. Employment levels are then expected to settle about 5-6% above previous estimates over the longer term.

Graph 3.

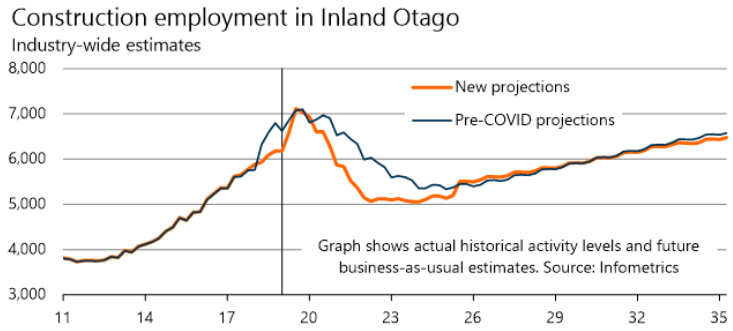


Inland Otago

The effect of COVID-19 on construction employment in Inland Otago is expected to be more substantial. Strong growth in employment during 2019 is expected to give way to sizable falls in job numbers between now and 2022. Slower population growth will hit residential activity, while the loss of international tourism will significantly undermine the ability and willingness of firms to invest in new non-residential buildings in Queenstown.

BAU construction employment levels in Inland Otago are projected to decline 23% over the two years to June 2022, which would leave employment 12% below our pre-COVID projections (see Graph). Construction employment is projected to bottom out in early 2024, with the trough in job numbers sitting 5.2% lower than our previous projections.

Graph 4.



In summary, the after-effects of the COVID-19 pandemic and lockdown are likely to reduce demand for construction workers in Inland Otago over the next two years and expedite our anticipated correction in construction activity. It is also worthwhile reiterating Graph 4 only shows BAU estimates of employment, and the potential for deferral or abandonment of major projects could also reduce demand for workers compared with our previous projections.

Nevertheless, our previous work suggested that labour and skill shortages in Inland Otago looked likely to be particularly critical over the next few years if the pipeline of construction projects had progressed as expected. The softer outlook for construction activity implies that capacity constraints will be less problematic for those people and businesses still looking to push ahead with construction work.

Coastal Otago still faces significant resourcing pressures associated with construction of the new hospital in Dunedin, with COVID-19 not expected to make much difference to underlying demand for construction workers. Arguably the biggest change caused by COVID-19 is the likely increase in unemployment in the region, which will boost the potential supply of workers that can be trained and brought into the Dunedin Hospital project.

However, offsetting this boost to the potential supply of labour, we note that the current border restrictions have effectively removed the ability of firms to source workers from overseas. While they remain in place, these restrictions could significantly restrict the availability of people to fill highly skilled and specialised roles within particular construction projects.

Executive Summary

Additional Documentation and data

This report provides an updated view of the Otago Construction Workforce and repositions the data, findings, issues and opportunities in a post COVID-19 Context. It provides detailed insights, case studies and supporting information in support of the Otago Construction Labour Forecasting ancillary report.

The ancillary report was written prior to the COVID-19 Lockdown on March 25th 2020, some sections on the impacts of COVID-19 on venerable groups has been added and graphs and associated text relating to forecast figures has been updated but the full narrative and language of the report has not been updated in light of COVID-19 impacts. Many of the findings are highly relevant but should be read in conjunction with this report:

Also part of the project documentation and deliverables are:

- Construction activity and demand for workers in Otago: a 15-year outlook for Dunedin City Council February 2020
- Otago Construction Workforce Forecasting tools *project* and *contracted* versions July 2020

Background

Construction in Otago has been booming with significant commercial, residential and infrastructure projects started or completed in the eight years up to 2020, many more were planned for the next decade including the new Dunedin Hospital. The current and planned activity meant the sector was already working near capacity with labour, particularly skilled labour, in short supply. That created a real risk that there would not be the number of workers required with the right skills to put planned projects in place.

In that context a consortia of the local councils and economic development agencies that make up the Otago region, together with Ngāi Tahu and the Ministry of Social Development, initiated a project to examine the demand for construction labour. The project aimed to:

- Create a complete picture of significant construction projects in Otago from 2020 – 2035
- Forecast demand for labour, at both a local and occupational level
- Provide options for meeting forecast demand

The project was subsequently expanded to include forecast supply of labour into the sector.

This report summarises the findings from the project. It has four main sections:

- Major projects
- Opportunities for the construction sector
- Supply of and demand for labour
- Recommendations for next steps

In addition:

- The Infometrics report, ***Construction activity and demand for workers in Otago: a 15-year outlook***, provides further detail, including methodology, about the forecasting of demand for labour; and
- The main ***Otago Construction Sector Opportunities Outlook*** report which expands on and provides examples of opportunities identified through the development process as well as a detailed analysis of the historical labour supply channels across the Otago region.

Please note these reports have not been updated post COVID-19 lockdown.

Projects

Otago has a large number of major construction projects planned over the next 15 years. There are a few very large projects, most notably the new Dunedin Hospital, which have a high public profile. Sitting alongside the high profile projects are a number of projects with significant values that are over and above what *might* be built during business as usual.

As at the beginning of July 2020, there were 88 projects planned over the next 15 years with a value of $20 million or more, including 14 projects with a value over $200 million. Collectively these projects had a combined value of just under $10 billion. Coastal Otago had $3.3 billion of projects, almost all in Dunedin City, while Inland Otago had $6.4 billion worth of projects, located primarily in Queenstown, Wanaka and Cromwell.

The types of project are very different between the two parts of the region:

- In Coastal Otago, the new Dunedin hospital makes up 42% of total project spending with education adding another 28% and infrastructure a further 21%. This means that more than 90% of project funding is publicly driven; and
- In Inland Otago almost 90% of funding involves private or commercial investment.

These different sub-regional drivers mean that solutions to meeting labour demand in each area need to be different. There is also considerably higher risk of projects not happening in Inland Otago, with commercial investors more likely to delay, or change plans, if economic or labour market conditions deteriorate.

It is important to note that the total build value, split by *Projects* and *Business as Usual* in this report, has been checked against an independently sourced list of vertical and horizontal construction projects across the Otago Region from Pacifecon Ltd in May 2020 with only a 1% variation.

Issues and opportunities for the construction sector

Volume and Timing

On the demand side, if the current list of projects continues as planned it is unlikely that the natural supply of labour in Otago will meet construction industry demand in the near term. If the Inland Otago market slows, as forecast in the short term, the timing of labour availability is unlikely to be matched by demand in Coastal Otago or Southland.

The volume of labour surpluses in Inland Otago is likely to be tempered by a reduction in the number of lower skilled migrants on work visas (defined by Immigration New Zealand from 27 July as earning less than the median New Zealand wage of $25.50 per hour) labour force in Inland Otago. labour workforce issue

Supply

On the supply side, there are likely to be impacts of the availability of migrant labour, which has made up 14% of new trade labour on average over the past five years. The process for requesting an exception for "other critical workers" (formerly essential workers) is being managed by Immigration New Zealand. The bar for being granted an exception to the border restrictions is set high to help stop the spread of COVID-19 and protect the health of people already in New Zealand.

We are advised by the Ministry of Education that holding an existing essential skills visa or being employed in a position that is on the skills shortage list is not sufficient to meet the 'critical worker' criteria for this process. Therefore, solutions need to be developed to ensure that there are enough workers, with the right skills, to deliver projects as planned. Given the size of the shortfall currently even in the changing wider economic context, there is unlikely to be any one solution that will solve the labour demand challenge. Instead, a range of solutions need to be put in place.

Overarching themes

During the course of this project we consulted with a wide range of stakeholders from different parts of the Construction sector throughout the Otago region. Stakeholders initially identified the issues facing the sector and then moved to focusing on opportunities to address these challenges.

The theme that has emerged most strongly through all opportunities is connectedness. This includes connections between people, businesses, agencies, programmes, and even physically through transport and infrastructure. Many of the barriers people identified arose when these connections broke down.

Overarching considerations that people identified all aim to increase this connectedness, and should be taken into account regardless of which individual initiatives or solutions are put in place. These include coordination in initiatives, planning and information sharing, and using local and central government levers.

There is a growing recognition that the construction sector needs to get better at working collaboratively to meet future need. The Government and some major construction firms are attempting to respond to this challenge through the Construction Sector Accord. The impact of this is yet to be seen and will be dependant on how much of the thinking can be put into practice.

At a local level, there are a number of things that can be done to improve connectedness, including better coordination of initiatives, information sharing, and collective lobbying of Government.

Four focus areas

Stakeholders identified four focus areas with the biggest potential to help meet the demand for construction labour. These were:

- Attracting workers
- Supporting Employers
- Supporting workers
- Accommodation

Each of these areas are interlinked and cannot be considered in isolation. Many solutions or actions fit within one of the four focus areas but have connections to one or more of the other areas.

Figure 1.

Four focus areas for meeting construction demand in Otago

Skills Hub

One of the solutions that been establ;ished for Coastal Otago is a construction skills hub based around Dunedin Hospital. The proposed skills hub is currently being called 'Workplace Central'. It is envisaged that there will be two distinct phases for this skills hub, pre-build and during the build:

1. Pre-build – the primary purpose is to sell the sector in general, and hospital build in particular, to prospective workers including young people, those not in work, and other career seekers.
2. During the build – the hub would focus on recruitment, retention, induction programmes, health and safety, culture, work skills, mental health, pastoral support and skills development.

There are five areas that need to be considered further relating to the design, number and location of a skills hub in Otago. These include:

1. Whether it is a physical building or something different
2. Functions that it should perform during the lifecycle of significant projects
3. Who will fund it?
    - Will funding channels change as the form and function of the hub changes
4. Number and coverage
    - Just the hospital build or Dunedin City
    - Coastal Otago, Inland Otago or all of Otago
5. Government interventions

Fees free training

The Targeted Training and Apprenticeships Fund (TTAF; also known as free trades training) will support learners to undertake vocational education and training without fees.

The TTAF will cover fees from 1 July 2020 until 31 December 2022 and will be paid directly to tertiary education organisations (TEOs) by the Tertiary Education Commission (TEC). This will enable TEOs to provide education and training without fees to learners.

TTAF will make a range of training and apprenticeship programmes at sub-degree level free for learners. It is targeted towards industry skill needs where demand from employers for these skills will continue to be strong, or is expected to grow, during New Zealand's recovery period from the impacts of COVID-19.

See the list of eligible programmes and qualifications. https://www.tec.govt.nz/funding/funding-and-performance/funding/fund-finder/targeted-training-and-apprenticeship-fund/qualifications-and-programmes/

Study in the following areas is covered by the TTAF:

- All apprenticeships
- Level 3-7 sub-degree programmes in targeted areas delivered by tertiary providers
- Industry training, outside of apprenticeships, in targeted areas.

The targeted areas are:

- Primary industries, including agriculture, horticulture and viticulture, fisheries and forestry;
- Construction, including building, plumbing, and civil engineering;
- Community support, including youth work, care for elderly, counselling, and community health including mental health and addiction support
- Manufacturing and mechanical engineering and technology;
- Electrical engineering; and
- Road transport (vehicle operations).

For further information refer to https://www.tec.govt.nz/fees-free-information-for-teos/eligibility-criteria-and-fees-free-coverage/

Apprenticeship Support Programme

The Apprenticeship Support Programme is delivered from a number of government agencies and includes:

- the new Apprenticeship Boost, which will help employers pay for new and existing apprentices in their first two years of training
- an expansion to MSD's Mana in Mahi programme to help people into long-term work and gain a formal industry training qualification
- support for seven existing Group Training Schemes to help them continue to employ some 1,700 apprentices and trainees
- the new Regional Apprenticeships Initiative, funded through the Provincial Growth Fund, which will support employers in the regions to take up new apprentices.

Apprenticeship Boost aims to provide support for employers to retain and take on new apprentices as the economy recovers from the impacts of COVID-19, so they can continue to earn and progress towards their qualifications.

This initiative recognises apprentices need more support from employers in their first two years while they are training and developing their skills.

Employers of first and second year apprentices who are in a Tertiary Education Commission approved New Zealand Apprenticeship or a Managed Apprenticeship will be able to apply for Apprenticeship Boost through the Ministry of Social Development (MSD).

Employers can apply for Apprenticeship Boost whether an apprentice has just started their training programme or is nearing the end of their first two years - right up until the apprentice has completed 24 months of their training programme (while the initiative is running).

Apprenticeship Boost will be available from 5 August 2020 and runs for 20 months.

Employers with an apprentice who is in their first year of their apprenticeship will be eligible for $1,000 per month, and employers with an apprentice in their second year will be eligible for $500 per month for a maximum period of 20 months.

Mana in Mahi was launched in August 2018 and aims to help people who are disadvantaged in the labour market move into long-term work and gain a formal industry qualification.

The programme includes a wage subsidy for employers, funding for pre-employment training, ongoing access to pastoral care and incentive payments for participants.

Group Training Schemes are existing industry-based training programmes which employ apprentices and trainees and provide related services to host employers.

A new regional apprenticeship scheme which will provide funding for regional employers to support them to take on new apprenticeships. The scheme will initially focus on displaced workers, and Māori and Pacific Peoples.

For further information refer to https://www.workandincome.govt.nz/work/apprentice-support/index.html#null

The Ministry of Social Development will be opening 36 **regional employment centers** across the country with four being established in the Otago and Southland regions, based in Oamaru, Dunedin, Queenstown and Invercargill.

Mana in Mahi:

Purpose: To support employers investing in skills for their business, while also proactively helping those who need additional support to gain long-term sustainable work and earn a recognised industry qualification.

Length of support: Up to 24 months from 5 August 2020. Support available is dependent on a participant's training pathway.

Job requirements: Permanent full-time or part-time roles only. The job must pay at least the minimum wage.

Aimed at: People of all ages who need additional support to gain and maintain employment, including those who are disadvantaged in the labour market and at risk of long-term benefit dependency.

Training pathway: Agree to a training pathway by the end of month three that includes a formal industry training qualification on the NZQF. For some participants this may include starting in a pre-apprenticeship qualification (such as NZQF level 2 or 3 qualification) and working towards an apprenticeship or NZQF level 4 qualification where appropriate.

Wage subsidy to employers: Up to $16,000 for the first year and up to $8,000 for the second year (while the participant remains in training).

· Paid via monthly instalments (applies to all new first and second year contracts from August 2020).

· Existing Mana in Mahi employers will continue to receive any wage subsidy payments as per their agreed payment schedule.

· Amounts are GST exclusive. GST will be added to payments where the employer is GST-registered.

Incentive payments for participant: Up to $3,000 in the first year and up to $3,000 in the second year (dependent on a participant remaining on a training pathway).

Additional financial support: Up to $8,000 each year towards industry training course fees (where not covered under Fees Free or the Targeted Training and Apprenticeship Fund schemes), up to a maximum of $16,000 over 24 months.

· Up to $2,000 pre-employment training.

· Up to $2,000 in each of the two years to help with any additional educational supports (such as help with literacy and numeracy tuition) or help with a work from home set up.

Pastoral Care Support:

· Free coaching and mentoring services for participants for up to 24 months.

· Support for employers through Te Heke Mai and In-Work Support for up to 24 months.

Apprenticeship Boost

Purpose:

To support employers who have employees in the first two years of a TEC-approved NZ Apprenticeship or Managed Apprenticeship. They need to be employed and in training. It can also be used to hire new apprentices.

Length of support:

Available from 5 August 2020 until April 2022, for up to 20 months from commencement.

Job requirements:

Available to new and existing apprentices who are in the first two years of a TEC-approved NZ Apprenticeship or Managed Apprenticeship.

Aimed at:

People of all ages actively training towards an approved apprenticeship.

Training pathway:

Enrolled in a TEC-approved NZ Apprenticeship or Managed Apprenticeship (new or existing) that leads to a level 4 NZ qualification of at least 120 credits.

Wage subsidy to employers:

Up to $12,000 ($1,000 per month) in the first year of the employee's apprenticeship and up to $6,000 ($500 per month) for the second year of the employee's apprenticeship. The different amounts available to first and second year apprentices acknowledge that an apprentice in their first year of training may required more support in the workplace and this is why are larger amount can be paid

Amounts are GST exclusive. GST will be added to payments where the employer is GST-registered.

Ministry for Social Development (MSD) Employment Zones

MSD has launched **Employment Zones** with sites in the Southern region located in Timaru, Dunedin, Invercargill and Queenstown. They offer a space for employers, jobseekers and other partner agencies to meet and access the services MSD have to offer. They are staffed by members of the employment team who are available to answer any queries and make connections for people using the centre to the range of employment, education and training opportunities available.

Employers

- A place to meet with jobseekers and discuss current vacancies and upcoming opportunities within their business / industry
- A space to conduct interviews (in person or virtually)
- Connect with employment team to discuss upcoming opportunities and understand range of products and services available to them to support recruitment needs

Clients

- A place to meet with employment team to discuss current and upcoming opportunities, and identify support available to them
- Access to kiosks and other tools to assist with job search
- Opportunities to meet with employers who are recruiting and a space to complete interviews
- Access to WiFi, for example, to participate in virtual job expos if they don't have internet access

Partners and Stakeholders

- A place to connect with and promote their services and initiatives to employers and job seekers
- A place to display information, such as redeployment opportunities through other agencies
- Space to run training and workshops.

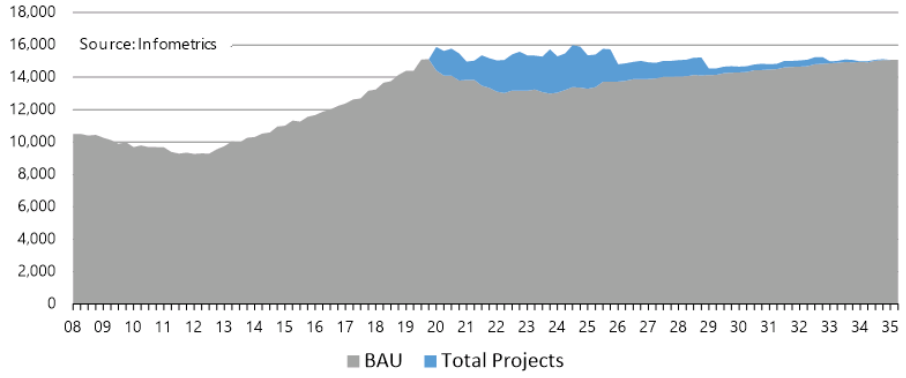
Supply of and demand for labour

Demand for labour

In the project based model the volume of major construction projects on the books in the Otago Region over the next few years drives additional demand for. Between 2020 and the end of 2025, the forecast projects would be expected to boost demand for workers in the construction industry in Otago by between 1,500 and 2,500 at any point in time. This project demand balances out the drop in business-as-usual employment. Reducing the number of new people required in the industry from a high of 2,500 in 2019 to an average of 1,000 per annum in the period 2020 – 2029.

Graph 5

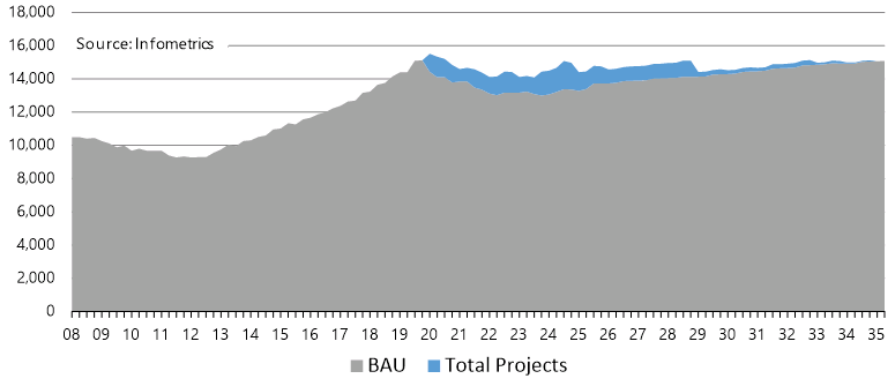
Projected construction employment in Otago Region - Project based forecast



In the contracted model the volume of major construction projects is reduced (particularly within the Inland Otago Region) with an associated reduction in labour. Between 2020 and the end of 2025, the remaining major projects are expected to need between 750 and 1,650 at any point in time which is insufficient to address the drop in business-as-usual employment under this scenario. Coastal project numbers, with retirement becoming the largest driver of employment demand reducing the number of new people required (supply Vs Demand gap) in the industry from a high of 2,500 in 2019 to a forecast surplus in 2021, though replacement staff will still need to be found.

Graph 6

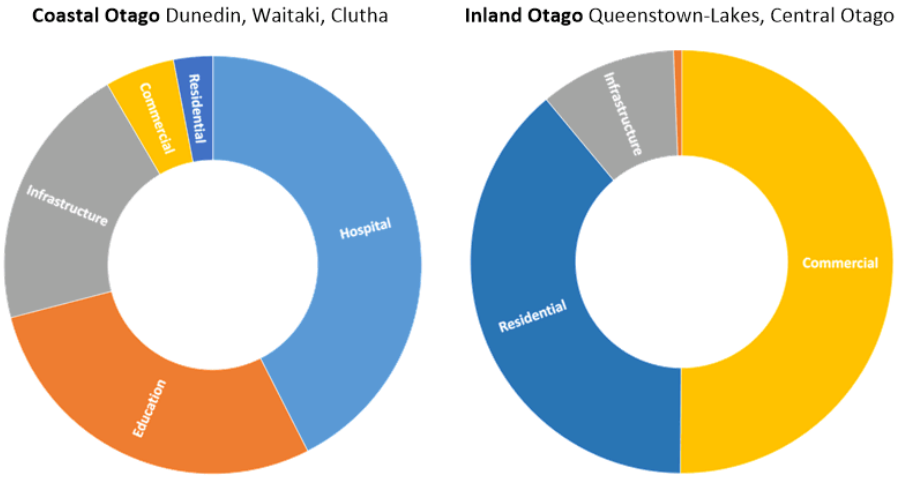
Projected construction employment in Otago based on a contracted project scenario



The nature of work is significantly different between inland and coastal Otago. Coastal Otago is largely publicly funded with approximately 35% linked to the new Dunedin Hospital, 35% linked to Education projects (particularly Otago University) and 20% Infrastructure, with the balance being Commercial and Residential projects. Inland Otago is almost the opposite with 50% Commercial, 30% Residential, 17.5% Infrastructure and the balance made up of Education projects.

Graph 7.

Project composition comparison between Inland and Coastal Otago

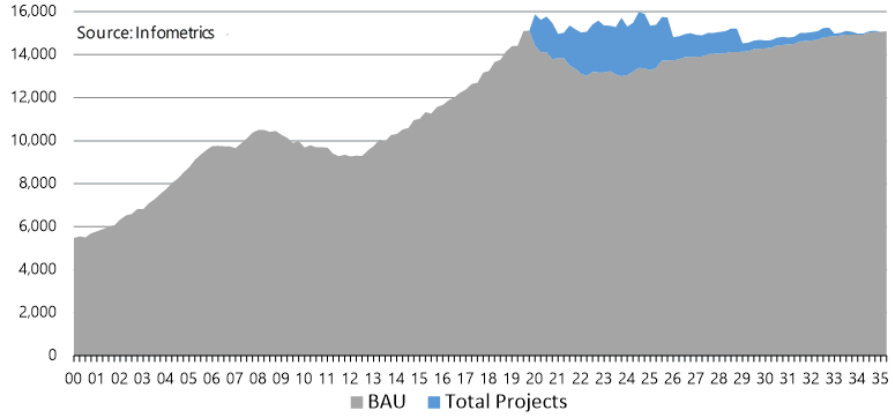


Under BAU conditions, construction activity, and associated demand for construction employment, in Dunedin is expected to gradually trend upwards throughout the forecast period. The lack of any significant cyclical downturn in this profile means the additional activity that is captured in our major project list will clearly add to demand for construction workers in the city. The lumpy demand profile for workers is likely to be most pronounced in 2023/24, when work on both the major buildings at Dunedin Hospital is expected to be in full swing.

While there is a reduction in project activity in 2025 and again in 2029 (see graph 8) this is more reflective of the lack of forecast data more than five years out rather than an actual forecast drop.

Graph 8.

Projected construction employment in Coastal Otago

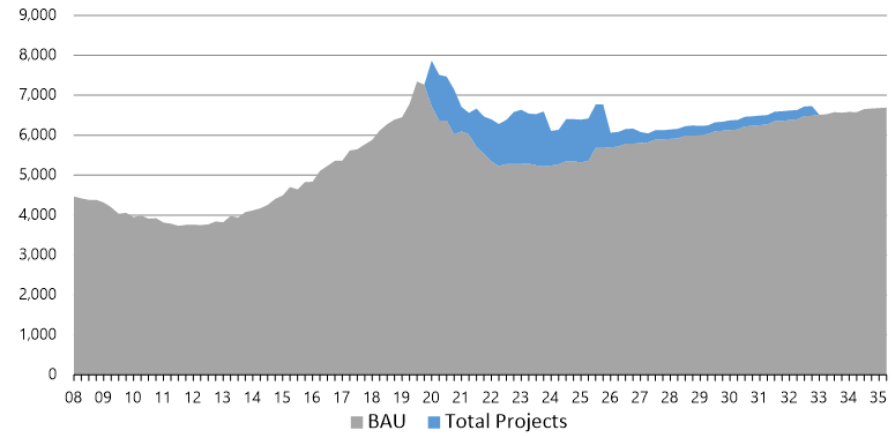


15

The project based forecast (see Graph 9) is based on the construction projects valued at twenty million dollars and above identified in primary research during the project in 2019 and verified by Pacifecon Ltd in July 2020.
As at the beginning of July there had been very few projects formally put on hold or cancelled so while the economic based BAU forecast shows a significant drop in 2020 the project based spike in employment still exists.

Graph 9.

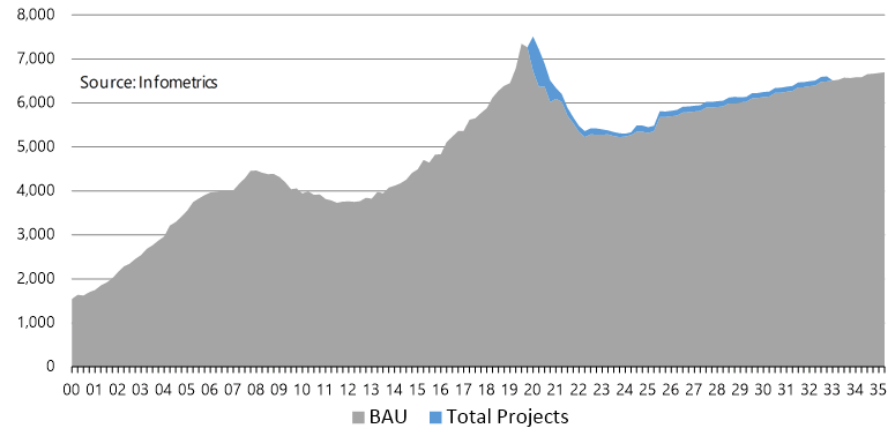
Projected construction employment in Inland Otago - Project based forecast



The contracted project scenario (see graph 10) applies an alternative logic to the project list proposing that all privately funded projects that have not started in Inland Otago will not proceed, while projects already underway will continue through to completion. Under this scenario a significant drop in employment demand is forecast between 2021 and 2025.

Graph 10.

Projected construction employment in Inland Otago - Contracted project scenario



It should be noted that the reality will probably fall somewhere between the two models (shown in Graphs 9 and 10) and two revisions of this forecast scheduled to take place in September and November 2020 will update the graphs and should show an emerging trend.

16

Supply of Labour

The biggest issues facing the supply and demand for labour in the Otago Region over the next 10 years are:

- Right time;
- Right place;
- Right skills.

Right time - Inland Otago could see an oversupply of skilled labour if the future aligns more closely with the contracted project view but the demand from the New Dunedin Hospital does not increase significantly until 2023 or later. (see graph 10)

Right place - Regional events such as the current loss of hospitality and tourism jobs in Inland Otago of forecast closure of the Rio Tinto Aluminium Smelter at Tiwai Point are also likely to have more immediate impacts on their local communities with increased employment in the Construction Industry not featuring strongly until 2023 and beyond (See Graph 13).

Right skills – The opportunity offered by *shovel ready* civil infrastructure projects in the inland region could be seen as an alternative employment partway which could be either permanent or until vertical construction projects get under way. While there are some core skills shared across the construction sector many of the new roles created will require different skill sets.

Helping people 'pivot' during the negative gap between supply and demand is a focus of the next steps section. The potential loss of skilled and upskilling people from the wider construction workforce in the Otago Region is a significant risk. The regions need to retain and maintain a robust construction workforce to help build Otago out of the forecast post COVID-19 decline.

Regardless of construction activity, the ageing construction workforce and the need to replace people retiring or leaving the industry means there will continue to be a demand for construction workers in Otago over the next 15 years. To better understand where this human resource will come from we need to understand more about the supply of construction workers into the region. This in turn, will help us to address the gap between supply and demand in the future (see Graph 12).

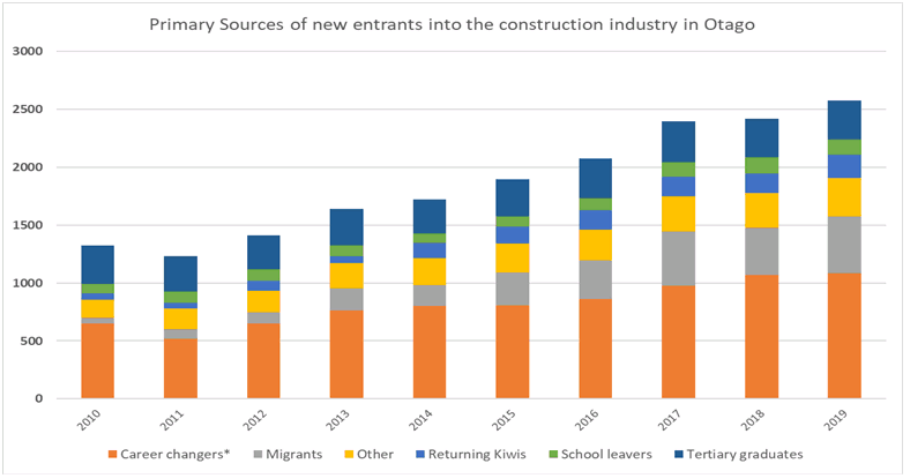
There have been seven significant labour supply channels for the Otago construction sector (see Graph 11). In order of their contribution to construction labour demand in Otago in 2018 these are:

1. Career changers (50%);
2. Migrants (15%);
3. Tertiary enrolments (10%);
4. New Zealanders returning from a prolonged time overseas (6%);
5. Secondary school leavers (5.5%);
6. Beneficiaries (2.2%);
7. Other (11%) including Corrections and people with incomplete data from the categories above.

Career changers have contributed more than 50% of new workers in each year since 2011. They will be a critical component of future workforce planning as people pivot between careers in order to stay in the region. The second largest and recently increasing supply channel has been migrant labour, changes to work visa requirements changed on 27 July 2020, (particularly for low skilled people earning less than the median New Zealand wage of $25.50 per hour). This cohort now need to apply for a work visa every six months and can only stay for a maximum of 36 months before they have to leave New Zealand for a mandatory stand down period of 12 months.

Graph 11.

Supply Side Gap with Sources of Workers



Comparison of construction labour supply and demand

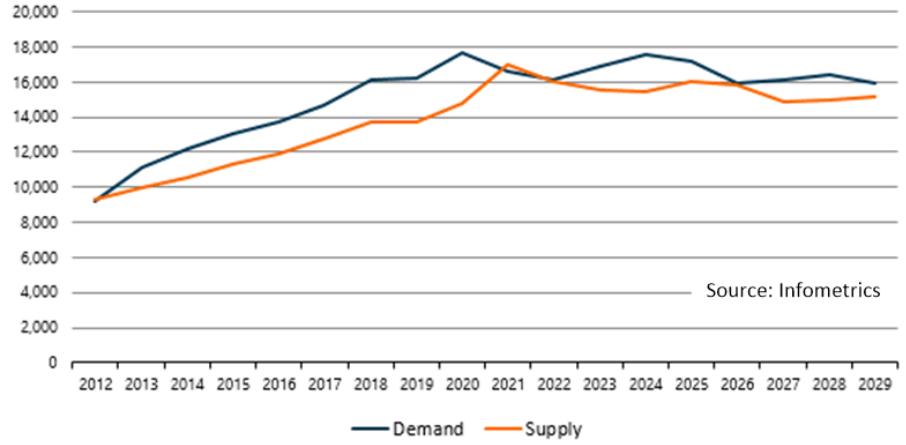
The construction sector needs to find workers for two reasons – to allow for increased demand and also to replace workers who leave the region or the sector. Graph 12 quantifies the gap between demand for and supply of labour. The gap represents the number of workers needed annually both historically and in the future.

The number of people needed in the construction industry in Otago fluctuates between 16,000 and 18,000 people between 2019 and 2025. While demand may be expected to increase if the more optimistic projection is achieved, even the more pessimistic economic forecast still has the sector requiring nearly 1,200 people per year over the next five years 2020 to 2024 to fill new or replacement roles across the Otago region.

While supply and demand seem to drop on from 2025 onwards this is more of a forecasting horizon rather than an actual drop in forecast demand. It is therefore important to continue to increase the supply of construction workers to be able to put in place all of the planned projects.

Graph 12.

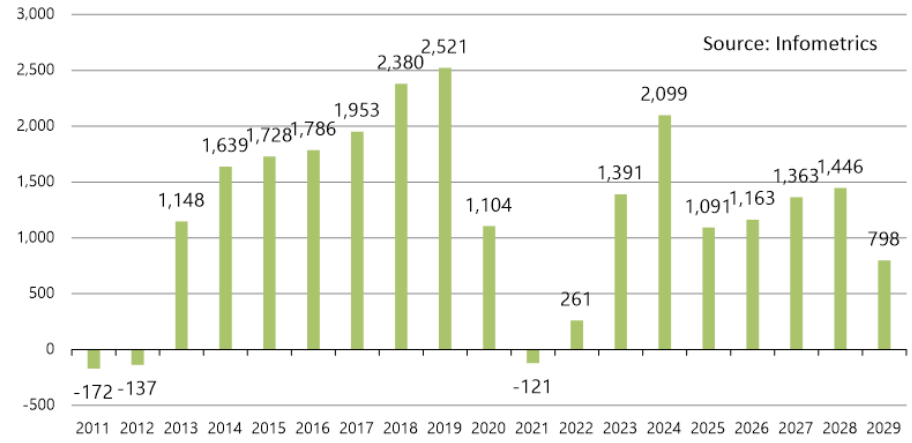
Supply and demand of Construction workers in Otago



18

Graph 13.

Projected employment gap in Otago Region



Recommendations for next steps

The coming months and years will be critical to the retention, maintenance, recruitment and upskilling of the Construction workforce needed to meet the level of work planned in Otago. Therefore, it is important that there is a plan for progressing actions identified through this project. Our recommendations for next steps are to:

1. Establish and maintain a regional group with a focus on construction workforce needs;
2. Build on the connections made through this project to put in place a network of anyone interested or invested in construction employment and training in the region;
3. Identify a short list of lower cost projects and put in place those that will have short term impact on meeting construction workforce demand, retaining capacity and pivoting staff and put these in place;
4. Scope and seek funding for a short list of bigger projects that will have short term impacts and longer-term returns to help the region meet its construction workforce demands;
5. Undertake further research or investigation about the construction workforce in Otago.

Regional Construction workforce group

One of the strengths of this project is that it was undertaken with people from across Otago with an interest in the Construction workforce and a real drive to facilitate change. Having people from all local councils along with central government, industry and iwi has given unique insights into what is happening at a local level.

Central Government is increasingly looking at ways that regions can take ownership of skill and workforce needs. The group in Otago is ahead of the game in this regard, and seen as a model for effective engagement. Moving forward, it has the potential to put in place change projects that go beyond what any one organisation could achieve on its own. This could be strengthened further by adding employers and workers - or their representatives, to the group.

Example: the Regional Skills Leadership Group (RSLG) will have a focus on all sectors in the region. Having a construction workforce group, which can help inform the RSLG on construction specific matters, would be incredibly valuable and help drive projects with immediate impact.

Creating a regional network

The most common theme during this project was connectivity. Employers, government officials, and other stakeholders identified the need for greater connections between people, businesses, agencies and social partners. One of the benefits of this project was that it built on existing connections and started to put in place networks of people with an interest in the Construction workforce. We were struck by the willingness of employers to share what they know and indicate their willingness to work collaboratively to build the sector.

Building on these connections and good will would have a positive impact on the sector overall and give the best chance for initiatives to be successful. In practice, this could involve creating regular communications, hosting functions or 'get togethers', or using the network to gain insights and trial initiatives.

Put in place projects with immediate impact

Some of the solutions identified in the main project document are relatively low cost and would have benefits that could be seen in the short term. Identifying and choosing some of these to put in place would both address construction workforce demand and serve as a springboard for larger projects. These projects would create visibility about the construction workforce and the work being done by a range of agencies to meet workforce demands.

Example: Identifying '*lifeboat*' jobs which allow people to pivot their skill set into another sector for a period of time. Motivated individuals could be retained in the region during periods of low construction activity without losing them from the workforce resulting in a skills and labour gap when the sector bounces back.

Scope and seek funding and buy in for bigger projects

Other solutions identified through this project are much larger in scale and can only really be successful with adequate funding and buy-in from a range of stakeholders. The proposed regional construction workforce group could scope and shortlist these projects with the aim of securing funding and buy-in for the ones identified as having the highest impact.

Example: A large scale Group Employment Scheme where a central organisation employs individuals who are then '*contracted*' out to horizontal or vertical construction companies. This model would provide continuity of employment and training to assist individuals to '*pivot*' between sectors and regions.

Undertake further research or investigation

During the course of the project, several areas of further research or investigation were identified that would provide insights into the construction sector on an ongoing basis. Some of these projects are short, stand-alone pieces of work while others are more focused on collecting and recording information. Progressing these projects would have value for employers and in the future would make it easier to measure the success of initiatives put in place following this project.

1. Better data at a detailed geographical level plus more consistent definitions of regions
2. More information about immigration – detailed levels, flows and post COVID-19 numbers
3. Research about the impact of immigration on the labour market and economy
4. Research on the mobility of construction workers – who moves, how often, where, permanent or short-term, etc.
5. More detailed training data such as coastal vs inland, infrastructure vs residential & commercial
6. Collect and disseminate information about construction workforce supply and demand on a regular basis.

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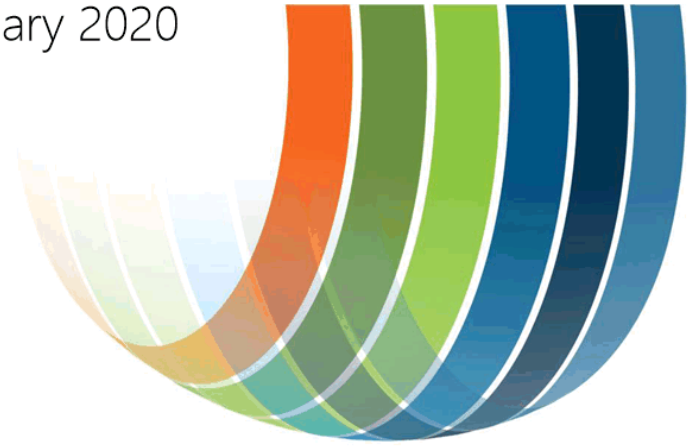
21

Construction activity and demand for workers in Otago: a 15-year outlook

for Dunedin City Council

February 2020



Infometrics
Economics put simply

Authorship

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Table of contents

Executive summary

The proposed construction of Dunedin's new hospital is estimated to cost $1.4b and will lead to a significant increase in demand for construction workers in the city. This upcoming construction project has acted as a catalyst for Dunedin City Council, in association with the Ministry of Social Development and Aukaha, to commission an investigation of labour demand pressures in the Otago construction industry over the next 15 years. BCITO and Infometrics have undertaken this research, consulting with a variety of stakeholders and industry players to understand the pipeline of construction activity and issues faced by the industry. Infometrics has modelled the effects of this pipeline on demand for construction workers.

Over 120 major construction projects have been identified that could take place within the Otago Region during the next 15 years. Most of these projects are scheduled for the next 5-8 years, which partly reflects a bias towards activity in the near-term when there is greater certainty for planning. Even allowing for some optimism bias in the planned projects, this pipeline still presents a significant boost to construction activity in the near term, particularly in Dunedin and Queenstown-Lakes.

Our modelling suggests that these projects could boost demand for construction workers in Otago by between 2,300 and 3,600 people between now and the end of 2025, an increase of 17-28% above business-as-usual levels. In Dunedin, demand could be lifted by more than 1,500 workers, with much of this increase being driven by the hospital build. Demand pressures look likely to be even more intense in Queenstown-Lakes, with major projects needing as much as 2,100 additional workers to progress in the near term.

Existing industry conditions vary significantly between the two areas. Construction activity in Dunedin appears to be close to business-as-usual levels, so the hospital construction and any other major projects are likely to simply boost labour requirements in the City. In contrast, construction activity in Queenstown-Lakes is currently highly elevated, particularly in the residential subindustry. Any easing in residential activity in Queenstown-Lakes has the potential to mitigate the labour demand pressures arising from the major projects in the District.

Our work suggests that some of Queenstown's demand for construction workers is also filled by labour from Southland. As a result, we note that the CBD redevelopment in Invercargill is likely to exacerbate demand pressures for workers over the next two years.

The implications for worker demand vary by occupation. For some occupations, such as electricians, there is a trend of increasing employment over time. This trend means that, even if the volume of work resulting from major projects eases in 5-8 years, many of the people recruited to work on these projects will be able to continue in the industry. This outlook favours permanent recruitment options.

Demand for some other occupations, such as construction project managers, is more heavily affected by the requirements of major projects. Any drop-off in activity over the medium term will have a bigger effect on worker demand in these occupations, suggesting that it might be more appropriate to bring workers in from outside the region temporarily to meet demand.

Although nationwide construction activity is forecast to peak within the next year, this outlook does not necessarily imply that significant spare labour resources will become available around the rest of the country. Canterbury provides the main exception, with further substantial declines in construction work expected in the region as activity continues to retreat from its post-quake highs. Construction employment in Canterbury is forecast to decline another 17% between 2020 and 2024, and these workers could potentially meet some of the demand pressures in Otago.

International migration has played a significant role in meeting demand for workers over the last decade. Roles in the construction industry remain prominent on Immigration NZ's skill shortage lists. Queenstown-Lakes and Dunedin are both relatively attractive destinations for migrants to settle, implying that foreign workers are another potential way to meet strong construction labour demand conditions in Otago.

An influx of workers from outside the region could create significant pressures in the housing market, as was experienced when the Otago Corrections Facility was built in Milton between 2004 and 2007. Dunedin's larger population and dwelling stock imply that the construction of the proposed hospital will have a less marked effect on the City's housing market than was observed in Milton 15 years ago. Nevertheless, stronger underlying economic conditions suggest a larger effect on the market than when Forsyth Barr Stadium was constructed in the wake of the Global Financial Crisis. The longer timeline of the hospital's construction means Dunedin's housing market could experience above-average rental and house price inflation for an extended period of up to five years.

We estimate that greater adoption of labour-saving technology could reduce labour requirements in 2035 for many construction occupations by between 10% and 30%. The current pipeline of projects suggests that labour demand pressures will be most intense in the near term, so there is likely to be limited scope for technology to address the industry's immediate labour requirements. Nevertheless, the scale of the hospital construction project provides an opportunity for innovative construction approaches to be utilised.

We emphasise that this report focuses primarily on quantifying potential demand for construction workers in Otago over the next 15 years. Although we also discuss some of the issues around the possible supply response to meet this demand, the topics we cover do not represent the full range of available options or solutions. BCITO's accompanying report provides more comprehensive coverage of the options to help reduce any gap between the future demand and supply of construction workers in Otago.

Business-as-usual conditions

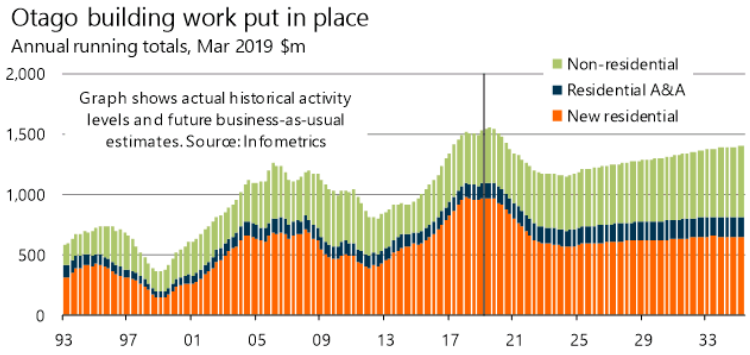
Establishing baseline levels of expected construction activity and employment in Otago over the next 15 years is a critical part of understanding future demand pressures in the industry. Our analysis suggests that construction activity is currently at cyclically high levels in Queenstown-Lakes and Central Otago, which are unlikely to be sustained over the medium term. Activity in Dunedin appears to be less elevated. Trends in construction employment under a business-as-usual scenario will broadly follow construction activity. However, we note that there is less scope for a decline in employment than in new construction work, given increasing demand for construction-related maintenance services as the population and building stock in the Region expand over time.

Construction activity

Overall results for Otago

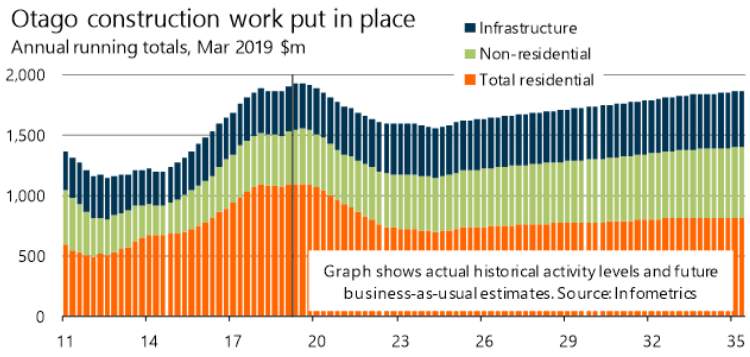
We have utilised a broad range of approaches to estimate business-as-usual (BAU) levels of construction activity in Otago's territorial local authority areas over the next 15 years. The summary results for Otago are shown in Graph 1 and Graph 2, with the approaches used in reaching these estimates detailed in *Appendix: Approaches to estimating BAU* (p59).

Graph 1



The most straightforward observation we can make from Graph 1 and Graph 2 is that construction activity in Otago currently appears to be at highly elevated levels. Between December 2012 and March 2019, there has been a 64% increase in total construction activity in the Region, equating to an average growth rate of 8.3%pa. This rate is well in excess of nationwide growth in construction activity, which has averaged 5.7%pa over the same period.

Graph 2



New residential construction has made the biggest contribution to growth in activity since 2012, increasing at an average of 13.8%pa and representing 72% of the lift in total construction since December 2012. Average growth rates for other building types in Otago over this period are 4.6%pa for residential alterations and additions (A&A), 5.6%pa for non-residential work, and 2.5%pa for infrastructure activity.

The fact that construction activity is currently at such unusually high levels is reflected in our BAU projections. Between June 2019 and June 2024, total construction activity in Otago could decline 19% under a BAU scenario if work returned to more "normal" levels. This drop would be entirely driven by a fall in new residential building work.

From 2024 onwards, a gradual upward trend in construction activity in Otago is anticipated under BAU conditions. This steady growth over the medium-term reflects the need for increased building work in line with an expanding population, a growing dwelling stock, and increasing economic activity.

Within Otago, we have estimated BAU levels of activity individually for each territorial local authority. This breakdown allows us to examine the differing trends between activity in Queenstown-Lakes and Dunedin, for example. These results are presented in the following sections.

Queenstown-Lakes

Growth in new residential building activity in Queenstown-Lakes is responsible for 73% of the increase in new residential building activity across the entire Otago Region since December 2012. Even more astoundingly, Queenstown-Lakes' new residential building activity accounts for 52% of growth in all construction activity across Otago since 2012.

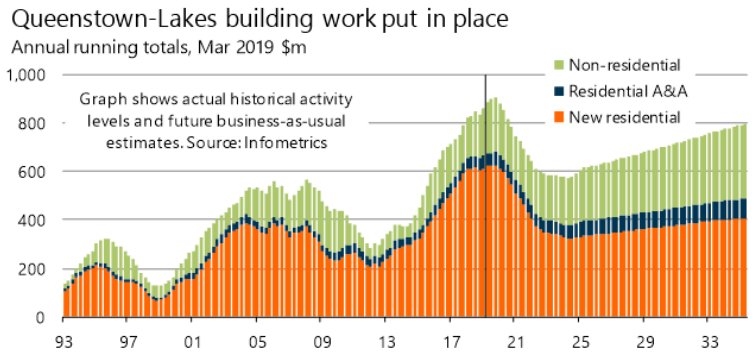
New dwelling consent numbers reiterate the extent of growth in residential building activity in Queenstown-Lakes. Annual dwelling consent numbers in the District totalled just 314 in 2011, but had more than quadrupled to 1,293 in the year to February 2018. This peak represented an increase of more than 50% on the previous record reached in May 2004.

This focus on Queenstown-Lakes' residential construction is not to say that non-residential activity has not grown as well. In fact, non-residential work put in place in the District has expanded by an average of 20%pa since December 2012, outpacing the

18%pa growth in new residential activity. However, the volume of new residential construction in Queenstown-Lakes is about three times the volume of non-residential work. In other words, the sheer size of the residential subindustry in Queenstown-Lakes means that its growth has far outweighed the influence of non-residential activity in the District.

Our assessment is that a drop of almost 50% in new residential work could take place over the five years to June 2024 if activity is to return to a BAU level (see Graph 3). Such a drop represents 82% of our estimated decline in total construction activity across Otago over the same period. When viewed in this light, prospects for residential construction activity in Queenstown-Lakes are a critical component of overall demand for construction workers in Otago.

Graph 3



Although non-residential activity in Queenstown-Lakes has grown substantially over the last seven years, our assessment is that activity levels are not as unusually elevated as in the residential subindustry. A 14% fall in non-residential work would take activity back down to BAU levels by the end of 2021. This relatively modest decline to return to BAU levels reflects the substantial growth in industry and economic activity that has occurred in Queenstown-Lakes. A significant expansion in the District's permanent population is leading to sustained growth in demand for commercial and industrial space.

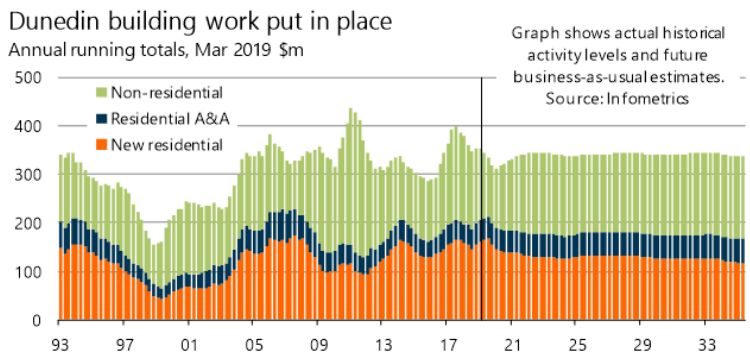
Dunedin

The difference between Queenstown-Lakes and Dunedin, in terms of construction activity, could not be much starker. Even with residential consent numbers in the City reaching a 24-year high in 2017, new residential building activity has only grown by an average of 5.2%pa since December 2012. New residential work put in place has so far failed to surpass the peak reached in 2007 before the Global Financial Crisis. Growth in residential A&A work has been even more muted.

Furthermore, in late 2018, the volume of non-residential work put in place dipped below its 2012 level, as recent significant building projects at the University of Otago were completed.

These results suggest that overall construction activity in Dunedin is currently not very far from BAU levels and, in the case of non-residential building, could even be below "normal" (see Graph 4).

Graph 4



Our estimates of BAU activity would result in an 18% decline in annual residential work put in place between June 2019 and June 2024. This decline would be almost entirely offset by a 24% increase in non-residential construction over the same period under BAU conditions.

Over the medium-term, BAU levels of construction activity in Dunedin are expected to hold steady. This lack of increase in construction activity primarily reflects expectations of slowing population growth and economic growth within the City.

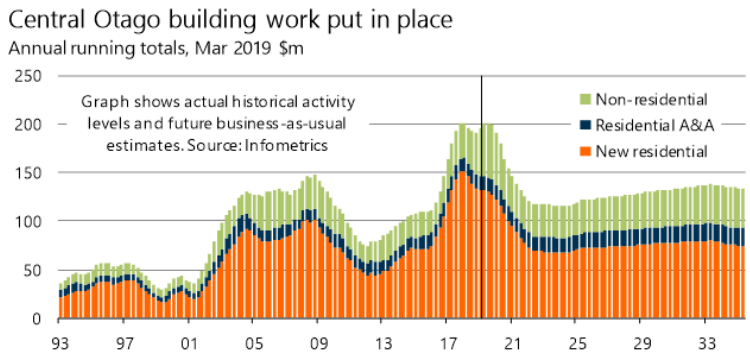
Central Otago

Changes in construction activity in Central Otago largely reflect the pattern of growth and contraction seen in Queenstown-Lakes' construction industry. In fact, since the end of 2012, growth in new residential building activity in Central Otago has slightly outpaced growth in Queenstown-Lakes. However, Central Otago's smaller size means that the District's increase in new residential building only represents about 12% of the lift in total construction activity across Otago during this period.

As is the case in Queenstown-Lakes, a softer housing market over the medium term, combined with slower population and economic growth, can be expected to cause a reduction of almost 50% in Central Otago's new residential building over the next five years if activity is to return to BAU levels (see Graph 5). Non-residential construction in Central Otago also appears to have more potential downside than in Queenstown-Lakes, with activity currently looking high relative to historic norms.

The fact that both residential and non-residential construction in Central Otago are well above BAU levels means that Central Otago could record a larger percentage fall in total activity than Queenstown-Lakes over the five years to June 2024. However, in terms of the volume of work and its contribution to overall activity in Otago, Central Otago's decline would only represent about one quarter of the anticipated fall in construction activity in Queenstown-Lakes.

Graph 5



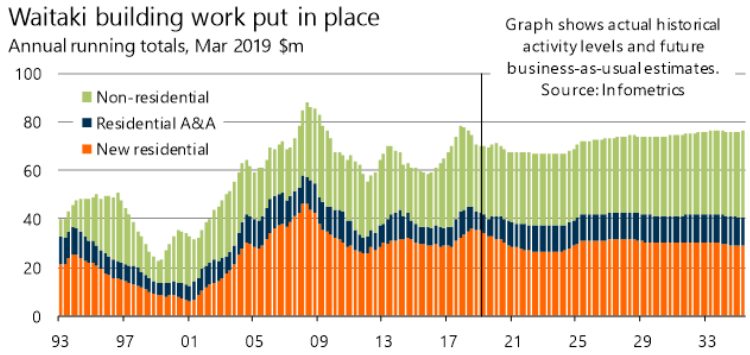
Over the medium-term, Central Otago's population growth and economic growth are projected to be slower than in Queenstown-Lakes. This relative performance is apparent in our BAU projections for construction work, with a stronger upward trend in activity predicted in Queenstown-Lakes than in Central Otago.

Waitaki

Growth in construction activity in Waitaki has been sedate during recent years. New residential activity lifted 24% between December 2012 and March 2019, but non-residential construction has been relatively steady, rising by just 1.7% over the same period. As a result, total construction (excluding infrastructure) in Waitaki has expanded just 9.2% since 2012.

This performance implies that construction activity in the District is currently close to "normal" levels. Prospects of a weaker housing market suggest that new residential construction could soften over the next 4-5 years, but the expected decline is reasonably modest. Residential A&A work and non-residential activity could record gradual increases, but the overall outlook for BAU construction activity in Waitaki is best characterised as "steady" (see Graph 6).

Graph 6

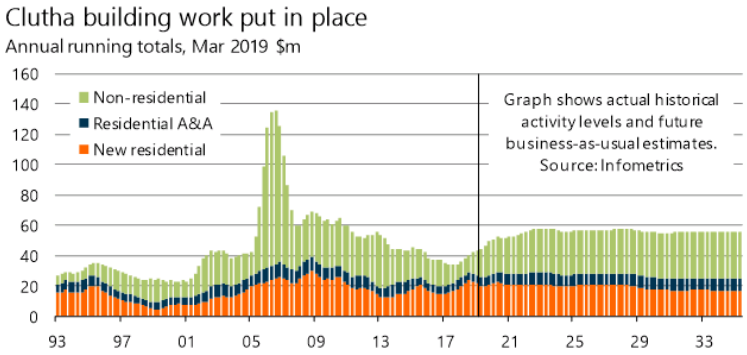


Clutha

Growth in Clutha's new residential construction activity over the last 6-7 years has been stronger than in Waitaki, with work put in place increasing by 56% (or an average of 7.9%pa) between December 2012 and March 2019. However, this increase has been outweighed by a 46% drop in non-residential activity in the District over the same period.

Our view is that residential construction work in Clutha is currently close to "normal" levels, but that non-residential activity is unusually low. Over the four years to June 2023, a 55% lift in non-residential work put in place would be sufficient to return activity to a BAU situation. This lift, combined with a small increase in residential construction work, implies a 30% increase in total construction (excluding infrastructure) in Clutha from current levels to activity that is consistent with BAU (see Graph 7).

Graph 7



Beyond 2023, there is minimal change in BAU construction activity in Clutha as the population starts to contract, the size of the dwelling stock plateaus, and average economic growth slows.

Infrastructure

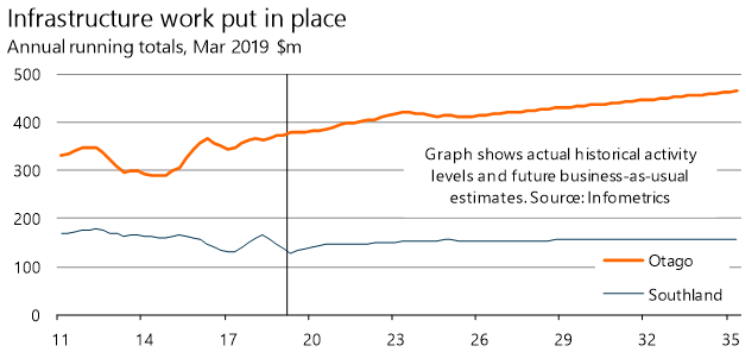
Data on infrastructure construction activity at a regional or local authority level in New Zealand is not readily available. However, since 2009/10, Infometrics has compiled data from central government agencies, local councils, and private sector companies to better understand the types and regional locations of infrastructure spending expected to take place. This data provides the basis for splitting Stats NZ's nationwide "other construction" figures from the national accounts into regional infrastructure spending.

In our view, infrastructure activity in Otago currently sits at close to BAU levels. Spending projections suggest moderate growth in activity, averaging 2.8%pa, over the four years to June 2023. Our BAU outlook shows a slight easing in infrastructure work over the following two years, before activity settles into a trend growth rate of about 1.2-1.3%pa over the medium-term (see Graph 8).

In contrast, we estimate that infrastructure spending in Southland is currently at its lowest level in the last decade and as much as 16% below BAU levels. Our projections

suggest that once this shortfall is recovered, infrastructure activity in the Region will hold steady, with virtually no change in BAU levels of work between 2024 and 2035.

Graph 8

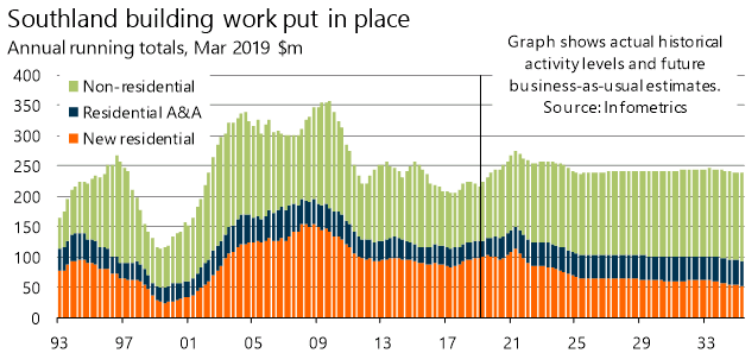


Southland

The volume of construction work in the Southland Region is, on average, about one quarter the size of activity across Otago. There is a degree of fluidity in the labour force between the two Regions, with Invercargill about 2½ hours by road from both Queenstown and Dunedin.

Unlike in Otago and across much of the rest of New Zealand, there has been little pick-up in residential construction in Southland over the last decade. New residential construction in the March 2019 year was up just 4.6% compared with December 2012, while a decline in residential A&A means that total residential work is virtually unchanged from seven years ago. Non-residential and infrastructure activity have also decreased since 2012.

Graph 9



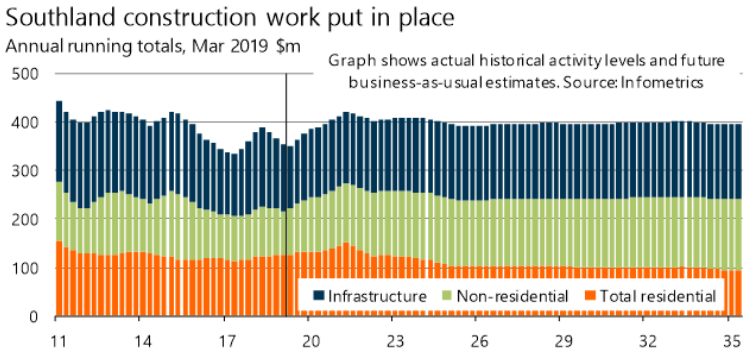
In this context, current construction activity in Southland is best typified as being below "normal", and our estimation of BAU levels implies a 20% increase in activity over the

two years to June 2021 (see Graph 9). This projected lift would be spread across all construction types. However, we note that cyclical factors and some "catch-up" for previous weakness are the main drivers of any near-term lift in new residential construction, rather than any improvement in underlying fundamentals such as population growth or household formation.

Beyond 2021, total construction activity in Southland under BAU conditions is expected to remain relatively steady. However, slowing population growth suggests a gradual decline in new residential building's share of total construction, slipping from 16% of activity in 2028 to 13% by 2035.

Graph 10 shows our BAU estimates for infrastructure activity in Southland alongside our residential and non-residential construction estimates.

Graph 10



Employment

Infometrics has detailed employment data by industry and occupation for territorial local authorities back to 2000. Employment within the construction industry for Otago is shown in Graph 11, as well as construction employment excluding employment in the house construction, other residential building construction, and heavy and civil engineering construction subindustries.[1]

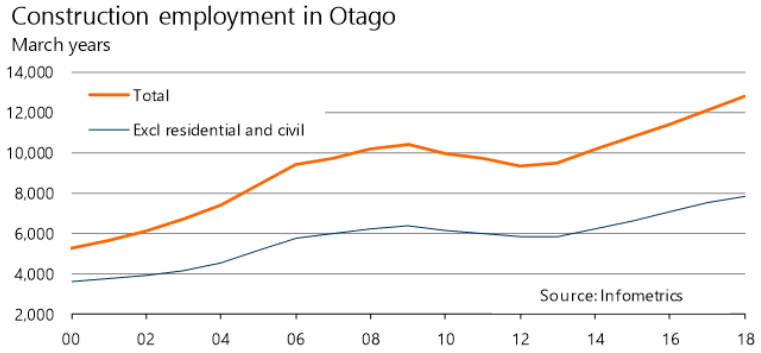
Except for the March 2010-2012 years, construction employment in Otago has grown consistently throughout the last two decades. This performance mirrors nationwide employment in construction. Since 2003, Otago's share of construction employment across New Zealand has held between 5.1% and 5.8% (see Graph 12).

Within Otago, Queenstown-Lakes' share of construction employment has lifted from 22.5% to 30.9% between 2003 and 2018 (see Graph 13). This increased share has come at the expense of Clutha (down from 8.7% to 4.9%), Dunedin (down from 45.8% to

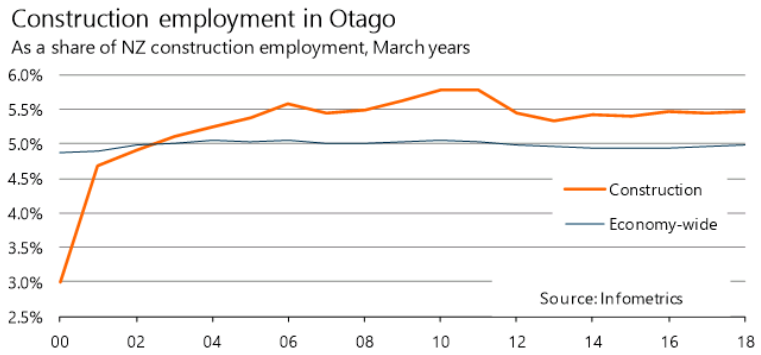
[1] The employment figures excluding the subindustries listed will still include employees working on residential or infrastructure construction. About 56% of total construction industry employment in New Zealand comes under the Construction Services industry, which includes subindustries such as Electrical Services, Painting and Decorating Services, and Plumbing Services. Employees in these industries could potentially be working on any type of construction activity.

43.2%), and Waitaki (down from 9.5% to 7.5%). Queenstown-Lakes' increased share of construction employment is consistent with the District's growing population and expanding share of construction activity.

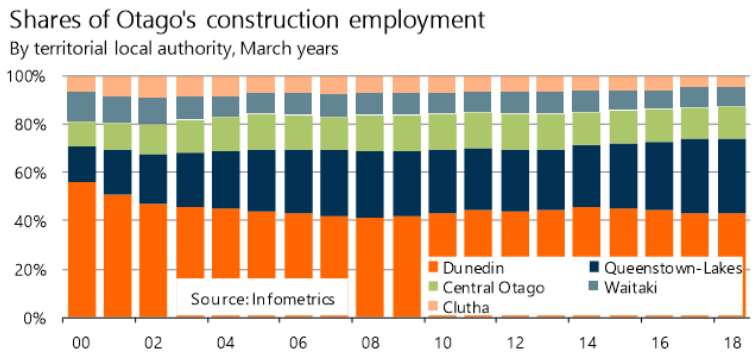
Graph 11



Graph 12



Graph 13



Infometrics

In our work modelling construction employment in Otago and Southland, we have found that employment in Southland is affected by construction activity taking place in Queenstown-Lakes. This finding is backed up by anecdotal evidence from conversations with people within the Region, who have reported that tradespeople in Invercargill can be willing to travel to Queenstown for work if there is limited activity in Southland. In terms of travel time by road, Invercargill is approximately two hours and 20 minutes from Queenstown. This travel time is about 10 minutes less than from Invercargill to Dunedin and 70 minutes less than from Dunedin to Queenstown. In this regard, the interlinkages between construction employment in Southland and activity in Queenstown-Lakes make sense.

Although we can could examine the employment data by detailed industry, this cut of the data tends to provide a muddied picture of employment trends. For example, the house construction subindustry includes a range of workers whose occupations are not specifically construction-related, such as chief executives or managing directors, office managers, and accounts clerks. Thus, in our view, it is more informative to examine employment data by detailed occupation.

The 56 largest occupations within the construction industry represent over 80% of total employment across the industry. However, 27 of these 56 largest occupations are not "construction specific" or, in other words, have less than half their economy-wide employment within the construction industry. The largest examples of these non-construction-specific occupations are labourers not elsewhere classified, chief executives or managing directors, and office managers.

Employment within the remaining 29 construction-related occupations in 2018 was equivalent to about 70% of total construction industry employment in New Zealand and 69% of total construction industry employment in Otago.[2] Across the territorial local authority areas within Otago, this figure ranges between 66% and 76%. As such, we believe that concentrating on these occupations provides an accurate trend of demand for workers across the broader construction industry.

Forecast outcomes

Our projections for construction employment in Otago and Southland under BAU conditions largely correspond to our baseline forecasts of construction activity in these Regions. The results for Otago are shown in Graph 14.

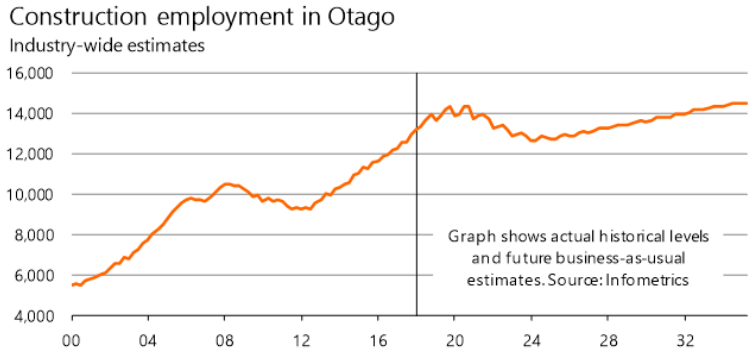
One notable feature of the historical data is that total construction employment tends to trend upwards over time. For example, the volume of construction activity (excluding infrastructure) in Otago in the year to March 2004 was similar to the volume of activity that took place in the March 2015 year (activity in 2004 was about 5% higher). Yet construction employment in Otago was more than 3,300 people (or 45%) greater in 2015 than it was in 2004.

This upward trend in employment over time reflects that a significant proportion of construction-related employment is associated with maintenance or similar work, rather than new construction. As the size of an area's population or building stock grows, more

[2] This occupational employment includes workers in these occupations who are not directly employed within the construction industry. For example, in Otago in 2018, there were 1,763 project builders employed within the construction industry and another 227 project builders employed in firms classified to other industries, such as manufacturing; administrative and support services; or professional, scientific, and technical services.

people are needed to carry out this maintenance work. Thus construction employment is influenced by both the size of an area's population (which tends to change only slowly over time) and construction activity (which tends to be more variable and cyclical in nature).

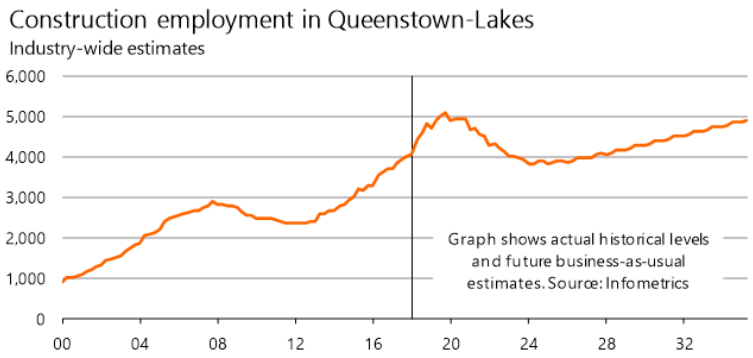
Graph 14



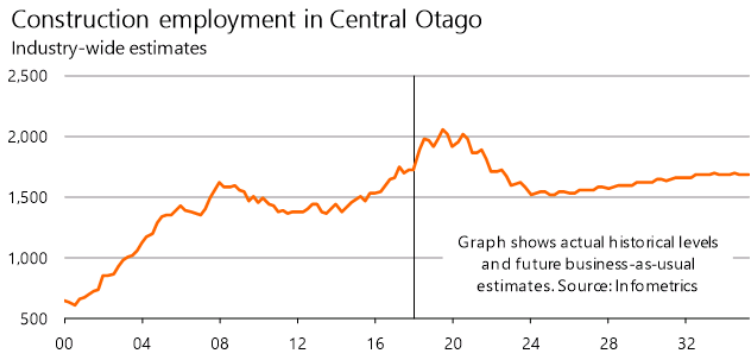
Our forecast of a cyclical slowdown in building activity under BAU conditions corresponds with a predicted 9.0% decline in construction employment under this outlook between 2019 and 2024. From 2025 onwards, construction employment in the Region is forecast to increase, in line with our forecast of an upward trend in both the population and BAU building activity. However, we note that, under this scenario, total employment does not surpass its 2020 peak until 2033. This outcome reflects that, in our view, construction activity in Otago is currently at highly elevated levels.

The key drivers of this expected decline in construction employment in the Otago Region are Queenstown-Lakes and Central Otago. Under BAU conditions, both districts are forecast to experience a decline of 21-23% in construction employment over the five years to December 2024. Even with an upward trend in employment predicted in these districts from 2025 onwards, neither area is projected to surpass its 2020 construction employment levels in the remainder of the forecast period (see Graph 15 and Graph 16).

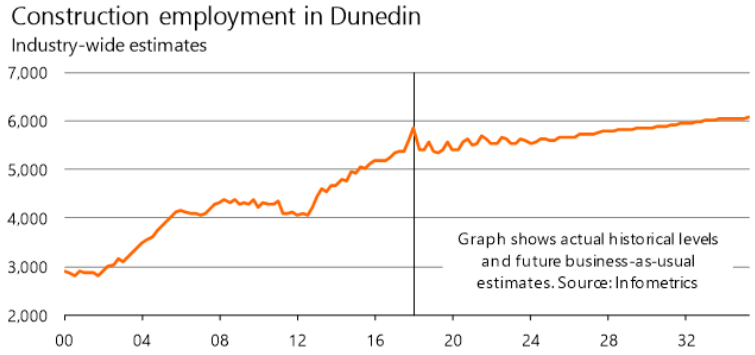
Graph 15



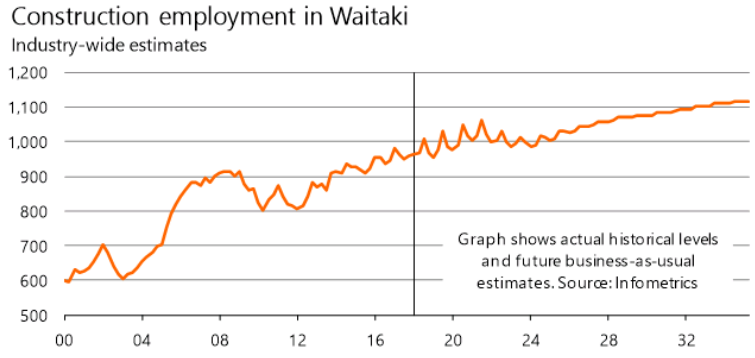
Graph 16



Graph 17



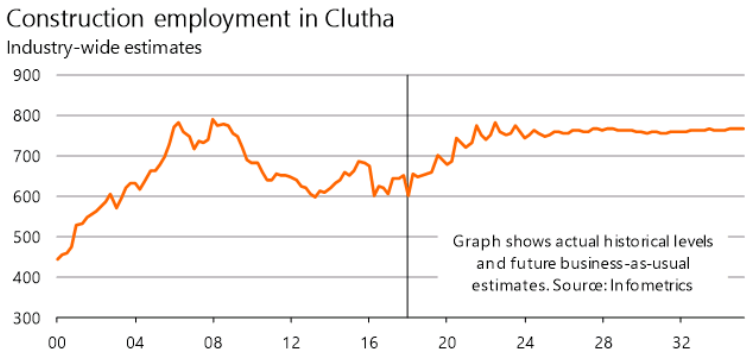
Graph 18



In contrast, construction employment levels in Dunedin, Waitaki, and Clutha do not appear to be as elevated and so are at less risk of falling in our BAU scenario (see Graph 17, Graph 18, and Graph 19). Indeed, in the near-term, Clutha's employment appears to be below "normal", which has the potential to drive faster construction job growth than

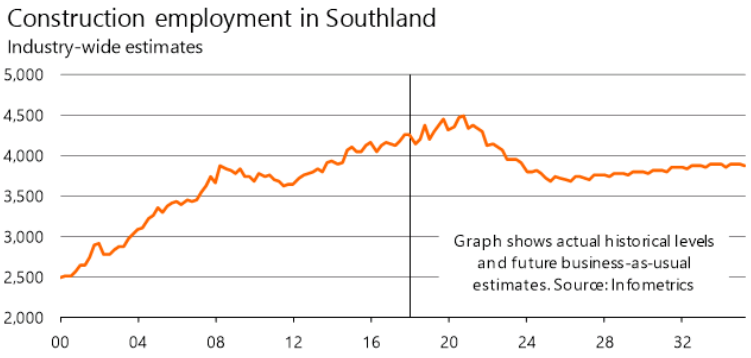
in other parts of Otago. A gradual upward trend in construction employment is projected to persist throughout the next 15 years across all three areas.

Graph 19



Our projection of a lift in BAU construction activity in Southland over the next couple of years is also reflected in our construction employment forecasts for the Region. Combined with the likelihood of Queenstown-Lakes continuing to experience strong demand pressures in the near-term, this outlook leads to a forecast of further growth in construction employment in Southland until 2021 (see Graph 20).

Graph 20



However, easing construction activity volumes in both Southland and Queenstown-Lakes over subsequent years can be expected to drive a decline in Southland's employment between 2021 and 2026. This fall in employment is not as marked as the ones anticipated for Queenstown-Lakes and Central Otago, reflecting that only a subsection of Southland's construction employment is driven by trends in Queenstown. Additionally, much of the employment within Southland is underpinned by maintenance work, rather than new construction activity, and so the underlying demand for tradespeople in the Region tends to be more stable than in high-growth areas such as Queenstown.

Southland's modest projected population growth over the medium term means that its upward trend in construction employment is relatively weak. Even by 2035, BAU construction employment in the Region is still forecast to be 12% below its 2021 peak level.

Major construction projects in Otago

Over 120 major construction projects are planned for Otago and Southland over the next 15 years, with the bulk of these pencilled in for the next 5-8 years. In calculating the potential employment effects of this work, we have applied a risk weighting to the projects to mitigate the construction industry's "optimism bias". We have also excluded some residential and infrastructure projects from our calculations as they better fit within our definition of business-as-usual activity. Even with these adjustments, demand pressures caused by major projects look likely to be particularly acute in Queenstown-Lakes until 2025 and in Dunedin until 2028. The effects on worker demand will vary by occupation, but there is a large group of occupations where workers could be vulnerable to job losses in future years if the pipeline of major projects shrinks, as the numbers currently indicate. We also examine the employment demands associated with the $1.4b replacement of Dunedin Hospital.

Identifying major projects

BCITO and Infometrics have compiled a list of more than 120 major construction projects scheduled to potentially take place in Otago and Southland over the next 15 years. This list of projects has been brought together using information from BCI New Zealand's LeadManager database alongside consultation with public sector stakeholders and private sector firms involved in the construction industry. The focus has generally been on projects with an estimated value of $10m or over.

Compiling this list of possible major projects has led to several challenges in terms of projecting future levels of construction activity and employment.

Optimism bias

Arguably the most important factor to bear in mind when viewing the projections of construction activity and employment is that there is typically a significant "optimism bias" when future projects are discussed. At any given point in time, there is likely to be a large number of potential projects in the planning pipeline, but it is unlikely that many of these projects will go ahead, at least in terms of the timeframes that developers or project backers are publicly asserting.

This issue is one that is regularly grappled with by BRANZ and Pacifecon when preparing the *National Construction Pipeline Report* for the Ministry of Business, Innovation and Employment.[3] In particular, the expected timing of private sector projects tends to be biased towards them being built sooner than actually occurs, creating a "hump" of expected projects in the near term, with fewer projects in later years when there is less

[3] See www.mbie.govt.nz/dmsdocument/6795-national-construction-pipeline-report-2019.

certainty about economic and market conditions. BRANZ and Pacifecon correct for this bias by smoothing project costs over a longer duration.

In preparing our projections of construction activity and employment, we have assigned a "risk weighting" to each construction project that effectively incorporates the likelihood of that project going ahead. The probabilities assigned to each project range between a 100% likelihood of going ahead for the new Dunedin Hospital or the Lakeview development in Queenstown, down to 20% for the Dunedin Harbour redevelopment project or the Pembroke retirement village in Wanaka. These subjective risk weightings have been prepared following consultation with relevant stakeholders about the projects.

In addition, there was a small number of possible construction projects for which information was available, but which we have chosen not to incorporate into our forecasts of activity or employment. All of these projects were in the infrastructure space, and were typically very large projects that have been proposed many years ago but have not progressed beyond a broad concept. Examples include the Lake Onslow / Lake Roxburgh hydro storage scheme or the Slopedown wind farm. Given the high level of uncertainty associated with both the viability and timing of these projects, as well as the significant potential effect their inclusion would have on our projections, we decided that the most sensible approach was to omit them from the forecasts at this stage. Should more information become available at a later date or any of the projects become more likely to go ahead, they can then be incorporated into the forecasts as appropriate.

Within, or on top of, business as usual?

Our methodology for estimating BAU levels of activity is detailed in *Appendix: Approaches to estimating BAU* (p59). However, in brief terms, our estimates are based on factors such as population growth and other demographic factors and/or the historic levels of activity relative to GDP. The determinants vary depending on which type of construction (residential, non-residential, or infrastructure) we are modelling.

For non-residential building, we have been able to further refine our estimates by removing large one-off consents from the historical figures. Our ability to remove these projects when calculating our BAU estimates effectively implies that any large non-residential projects that have been identified as likely to go ahead in the future lie over and above the BAU baseline.

However, the distinction between BAU and additional major projects is much less clear for residential and infrastructure work. For example, plans to build more than 2,000 homes at Hanley's Farm by the end of 2027 obviously reflect expected demand for new housing that will arise from population growth over that period (we estimate that underlying demand in Queenstown-Lakes will total almost 5,2000 dwellings between 2020 and 2027). It is unrealistic to add the dwellings at Hanley's Farm on top of existing estimates of "normal" levels of residential construction activity. As a result, we have assumed that 95% of these dwellings will fall within the BAU envelope of activity.

Construction of multi-unit dwellings, such as apartments or retirement villages, is more likely to create a spike in construction activity and employment compared with BAU, due to the "lumpy" nature of these projects, which typically see an above-average number of these types of dwellings constructed over a period of 1-2 years. As a result, we have generally assumed that a higher proportion of this type of residential construction lies outside BAU.

The lack of detail about historical infrastructure spending makes it even more difficult to assess what should lie outside our BAU estimates. For example, stormwater network upgrades scheduled for South Dunedin between 2022 and 2024 could be viewed as BAU activity given that this type of work is undertaken by local councils on a continuous basis. However, at an estimated cost of $35m, the size of this project suggests that at least some of the work is over and above BAU activity.

In terms of the infrastructure picture, reasonable estimates of "normal" spending levels by local government on various types of infrastructure can be made using the councils' previous annual plans and annual reports. However, this process is much more difficult for work that is not being funded by local government. Looking forward, it is difficult to know what proportion of the large projects identified for the next 15 years simply represent a "normal" level of activity. We have attempted to make sensible estimates of how much infrastructure work lies outside BAU activity, but stress that there is a high degree of uncertainty around these numbers.

Discussions with those involved in the infrastructure subindustry also highlighted concerns about the likelihood of increased spending associated with tougher freshwater standards being considered by the government. GHD estimates that the probable costs to upgrade wastewater treatment plants across New Zealand that are discharging to freshwater and ocean are between $2.5b and $3.8b,[4] some of which will be over and above councils' current planned spending. Beca estimates that an additional $3.0-4.4b will also be required to upgrade water supply networks nationally.[5] This potential additional spending is not accounted for in our modelling, and it represents a significant potential risk that infrastructure spending and the associated demand on labour and other resources is pushed even higher on a sustained basis over the medium term.

Construction activity attributing to the major projects

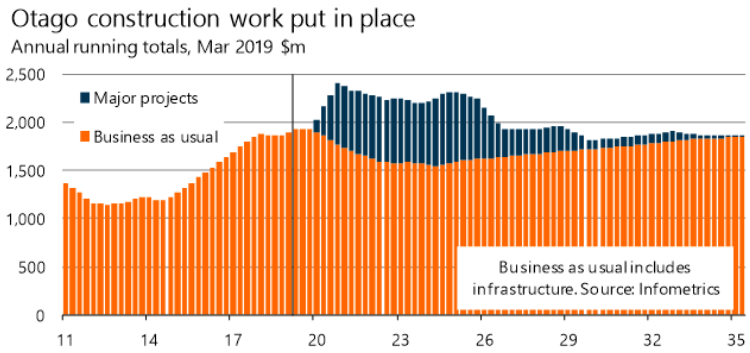
The expected volume of construction activity from major construction projects in Otago over the next 15 years is shown in Graph 21. The graph demonstrates that, even with our expectation that BAU levels of activity ease between now and 2024, the major projects that are expected to progress will keep activity at elevated levels over the next five years. It is only during 2025 and 2026 that total activity is expected to ease significantly. Even then, we note this result is possibly only caused by a lack of information about private sector projects that might take place over the medium term.

Within the Otago Region, the most acute demand pressures in the construction industry will be felt in Dunedin and Queenstown-Lakes. For Dunedin, this pressure mostly arises from the proposed $1.4b replacement of Dunedin Hospital between 2020 and 2028 (see Graph 22). The University of Otago also has a significant amount of construction planned. The University's $920m programme of work is spread over a 20-year period and so will place less concentrated demand on resources than construction of the

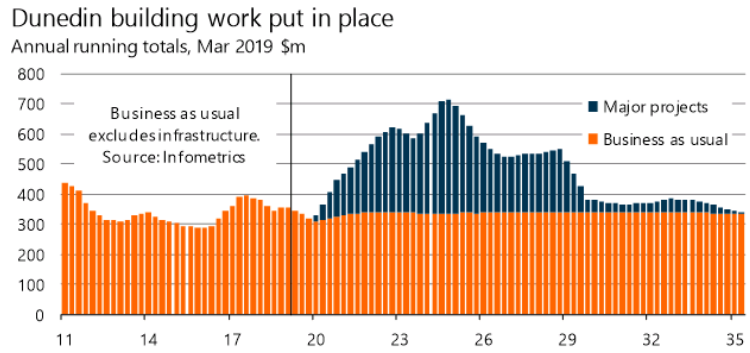
[4] www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-documents/$file/Report-3-Addendum-Cost-Estimates-for-Upgrading-WWTPs.pdf, p12.
[5] www.dia.govt.nz/diawebsite.nsf/Files/Three-waters-documents/$file/Additional-Analysis-on-Three-Waters-Drinking-Water-Work.pdf, piii.

Hospital. Nevertheless, any overlap of construction between the University's projects and the Hospital will create even more intense demand pressures in Dunedin.

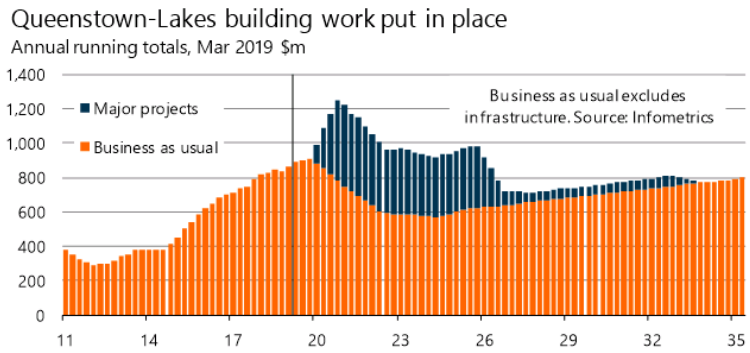
Graph 21



Graph 22



Graph 23



The nature of activity in Queenstown-Lakes is much more piecemeal, with a high proportion of construction projects in the pipeline originating from the private sector. Unlike Dunedin, Queenstown-Lakes is expected to undergo a significant decline in BAU activity levels over the next 4-5 years as activity retreats from current cyclical highs. If this reduction occurs, it is possible that future levels of construction activity could be similar to current activity levels, even once major projects have been included in the outlook (see Graph 23). This conclusion is obviously dependent on a decline in the area's BAU levels of activity.

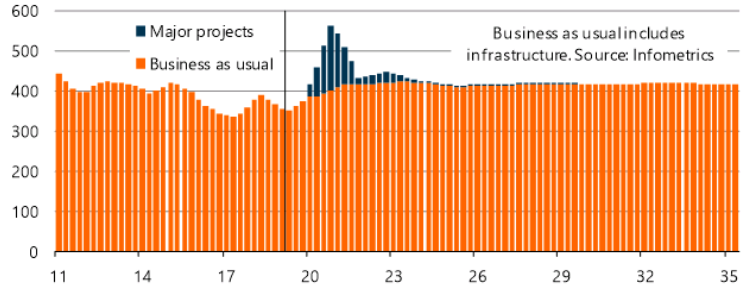
As is the case with the Otago Region as a whole, the volume of expected activity associated with major projects in Queenstown-Lakes falls away sharply during 2025 and 2026. This result potentially reflects the lack of certainty about private sector projects further out in the forecast period.

We also note the near-term demand pressures being created in Southland by the CBD redevelopment in Invercargill (see Graph 24). Demand for labour and other resources in Southland could have potential flow-on effects for capacity in the Otago Region, particularly in Queenstown-Lakes, where strong levels of construction activity have been partly facilitated by utilising labour from Southland.

Graph 24

Southland construction work put in place

Annual running totals, Mar 2019 $m



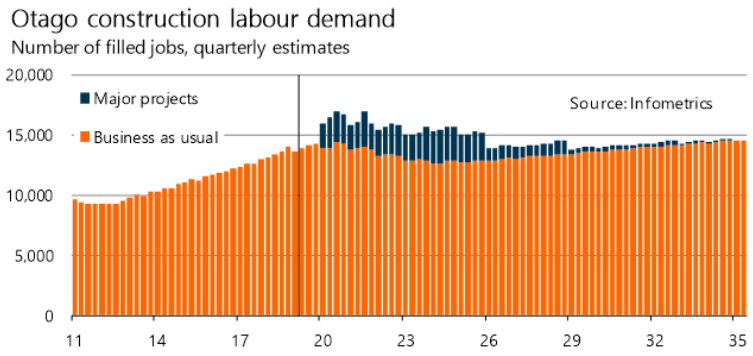
Employment results

With such a considerable volume of major construction projects pencilled in for the Otago Region over the next six years, the additional demand for labour associated with this work is very significant. Between now and the end of 2025, these major projects are expected to boost demand for workers in the construction industry in Otago by between 2,300 and 3,600 at any point in time (see Graph 25). This demand represents an increase of between 17% and 28% over business-as-usual employment.

It is important to note that these estimates of employment associated with major construction projects in Otago are demand-driven. The figures estimate the need for workers if the projects were to go ahead as indicated in our research and consultation with stakeholders. As such, the projections should not be treated as forecasts of what will actually happen to construction employment, but they are instead intended to highlight areas where demand pressures look likely to be particularly intense. Responses

to these pressures could include active attempts to boost the supply of labour through increased training or bringing in workers from outside the region, or delaying projects until labour shortages and capacity pressures are less of a constraint on activity.

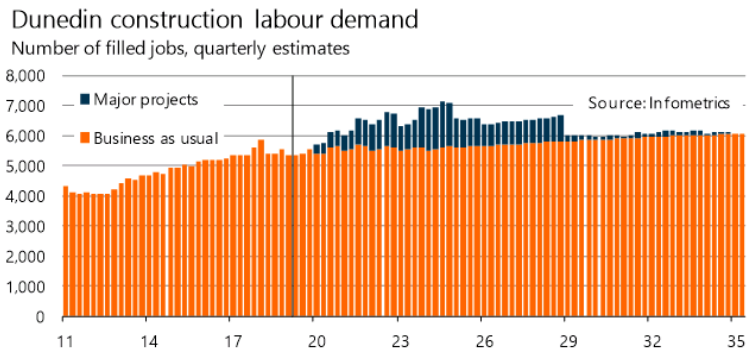
Graph 25



Within Otago, the two most critical areas of demand are Dunedin and Queenstown-Lakes. The forecast profiles of BAU activity differ across the two areas, as does the nature of the planned work that comes into our list of major projects. These differences imply that the timing and specific occupational stresses will vary between Dunedin and Queenstown-Lakes.

Under BAU conditions, construction activity in Dunedin is expected to trend gradually upwards throughout the forecast period. The lack of any significant cyclical downturn in this profile means the additional activity that is captured in our major project list will clearly add to demand for construction workers in the City.

Graph 26

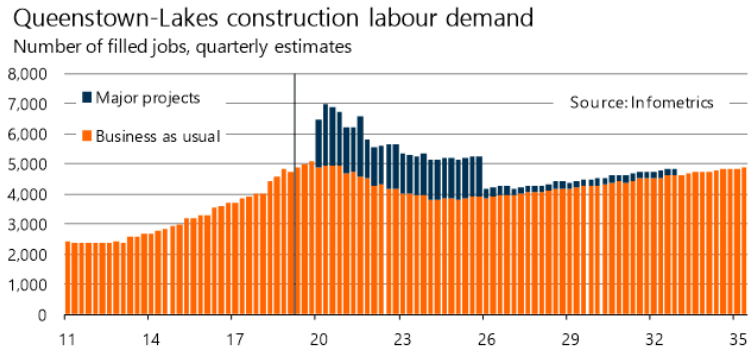


We have previously observed that the most significant additions to construction activity in Dunedin from our list of major projects are between 2021 and 2028. The associated spike in demand for workers is likely to be most pronounced in 2023/24, when work on both the major buildings at Dunedin Hospital is expected to be in full swing. At its peak,

this work, in combination with other major projects in the City, could boost demand for workers in the construction industry by more than 1,500 people (see Graph 26).

The need for additional workers in Queenstown-Lakes is set to be even more critical, with as many as 2,100 more workers required to meet major project demand within the next 18-24 months (see Graph 27). Looking forward, the pipeline of major projects in the District remains relatively large through until the end of 2025. However, the predicted decline in BAU construction work means that these demand pressures could become less intense by 2023. Even though major projects in Queenstown-Lakes are still expected to require almost 1,400 workers by that time, our projection is that total construction employment in the District will be just 5.5% higher than current levels.

Graph 27



If we examine specific occupations within the construction industry, we see three broad trends in the way that demand for workers will be affected by the major projects during the forecast period.

Occupations with a growth trend

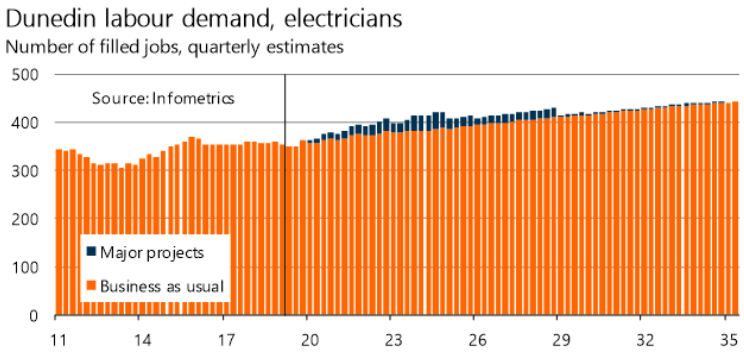
For the first set of occupations, our modelling work suggests that employment in these occupations is only moderately affected by changes in construction activity. In many cases, employment in these occupations is strongly influenced by the size of the population and building stock, and job numbers have tended to trend upwards over time in line with these variables. As a result, demand for workers in these occupations in 10-15 years' time is likely to surpass current levels and, in some cases, even exceed near-term demand levels when major projects are considered.

Occupations that fall into this grouping include electricians, plumbers, roof tilers, floor finishers, bricklayers, wall and floor tilers, glaziers, earthmoving plant operators, and paving plant operators. Our projections for electricians are shown for Dunedin in Graph 28 and for Queenstown-Lakes in Graph 29.

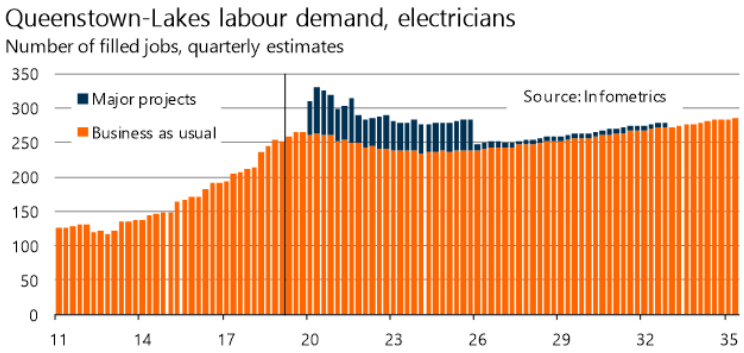
At the time of their biggest contribution in September 2024, the major projects in Dunedin are expected to add 27% to overall demand for construction workers in the City. At the same point, these projects are only expected to boost demand for electricians by 9.1%. And even when work associated with major projects in Dunedin

drops away in 2029, demand for electricians in the city is still forecast to be 15% above current levels.

Graph 28



Graph 29



In Queenstown-Lakes, the larger near-term spike in major projects leads to a more variable forecast of demand for electricians than in Dunedin. Nevertheless, this outlook is still smoother than for construction occupations in our other broad groupings.

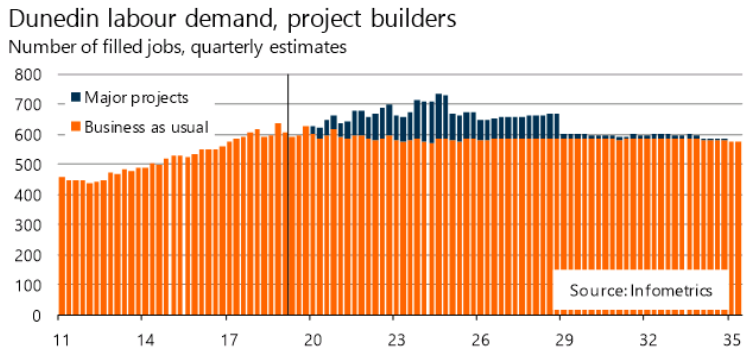
For the occupations in this grouping, these results imply that demand pressures and skill shortages associated with major projects are likely to be less intense than for other occupations. There is likely to be some weakening in demand conditions when the pipeline of major projects shrinks in the future. This outcome appears to be most pronounced in Queenstown-Lakes, but the potential weakening in Dunedin as well should not be overlooked. Notwithstanding this period of transition and short-term weakness, it is likely that many people who are recruited to work on projects over the next 5-8 years will be able to continue in the industry given demand conditions over the longer-term.

Occupations with moderate responsiveness to major projects

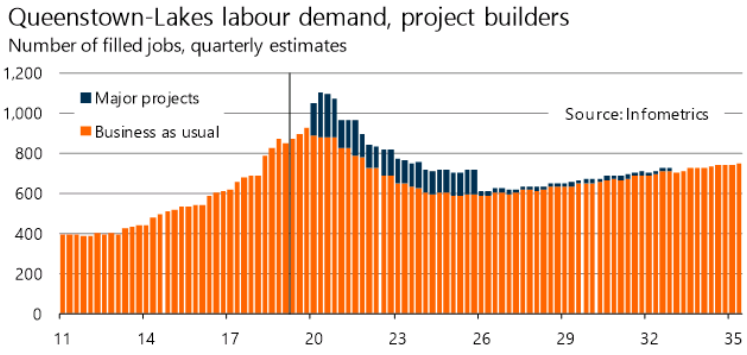
Demand for workers in this second set of occupations is more responsive to changes in construction activity than the first set. However, we estimate that the boost to demand for workers from the pipeline of major projects will still be below the average increase in employment across the construction industry. For these occupations, there is typically a baseline level of employment that can meet some additional demand for work before extra people need to be taken on.

Occupations that fall into this grouping include project builders, excavator operators, and drainlayers. Our projections for project builders are shown for Dunedin in Graph 30 and for Queenstown-Lakes in Graph 31.

Graph 30



Graph 31



For both areas, the lift in demand for project builders due to major construction projects is smaller than the boost to industry-wide demand for workers. In Queenstown-Lakes, the increased requirement for project builders averages 19% between 2020 and 2025, compared to 35% more workers across the entire construction industry. In Dunedin, the gap is much smaller, with a 14% boost to project builder numbers caused by major projects between 2020 and 2028, compared to a 15% boost in numbers across all construction industry workers.

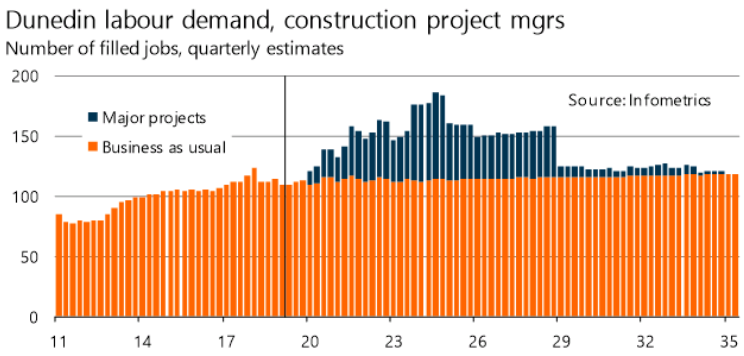
For these occupations, the results imply that demand pressures are likely to be strong, but not as intense as for some other occupations within the construction industry. People working in these occupations are potentially exposed to job losses in the future if the volume of construction work in the pipeline shrinks significantly.

Occupations with high responsiveness to major projects

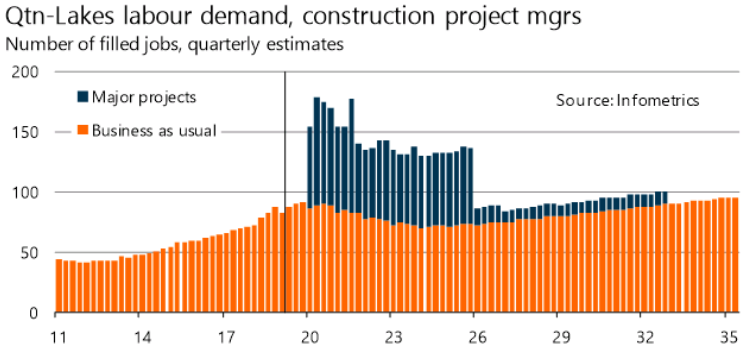
Our final grouping includes those occupations where demand pressures are likely to be felt most acutely. Our modelling shows that demand for workers in these occupations is highly responsive to changes in construction activity. Changes in employment associated with major projects are likely to be larger, in percentage terms, than changes in job numbers across the entire construction industry.

Occupations within this grouping include carpenters, construction project managers, solid plasterers, building associates, landscape gardeners, quantity surveyors, telecommunications technicians, scaffolders, concreters, fencers, electrical line mechanics, fibrous plasterers, drillers, and air conditioning and refrigeration mechanics. Our projections for construction project managers are shown for Dunedin in Graph 32 and for Queenstown-Lakes in Graph 33.

Graph 32



Graph 33



Major projects in Dunedin could lift required construction project manager numbers by as much as 63% in 2024, well above the 27% industry-wide lift in employment. In Queenstown, the outperformance of construction project managers is even greater, with potentially more than double the number required in the near-term if demand associated with major projects is going to be met.

For the occupations in this grouping, people are highly exposed to swings in construction activity that can lead to significant changes in demand for workers. Consequently, if a surge in demand associated with a large project (or projects) is not expected to be sustained over the long term, it might be more appropriate to temporarily bring in labour resources from outside the region to meet demand.

Other occupations

There are some occupations that do not neatly fit into these groupings and display different trends between Dunedin and Queenstown-Lakes. These occupations include painting trades workers, builder's labourers, and building insulation installers. The variation between Dunedin and Queenstown-Lakes most likely relates to the different mix of activity that makes up the major projects in each area. Demand for painting trades workers and builder's labourers is more responsive to the lift in activity caused by major projects in Queenstown-Lakes than in Dunedin. In contrast, we estimate that there will be a bigger shift in demand for building insulation installers caused by the major projects in Dunedin than in Queenstown-Lakes.

The replacement of Dunedin Hospital

The sheer magnitude of the estimated $1.4b replacement of Dunedin Hospital means that the project's effects on demand for construction workers deserves its own separate discussion.

In our modelling, we have separated the project into two discrete components.

- The Ambulatory Services Centre is expected to be constructed between mid-2020 and the end of 2024, at an approximate cost of $300m.
- The Acute Services Building is expected to be built between the June 2021 quarter and the end of 2028, costing about $1.1b.

For each building, we have split the work over four stages.

- Demolition, site clearance, and site establishment
- Foundations
- Structure and façade
- Internal works and completion

The results of our modelling of demand for construction workers are shown in Graph 34.[6] Table 1 splits out selected occupations where the numerical labour demand requirements of the hospital build are largest.

The greatest labour demand for the project is expected to be during late 2023 and throughout 2024. This peak in demand is driven by both buildings being in relatively labour-intensive phases – the Ambulatory Services Centre will be undergoing internal works and completion, while construction of the structure and façade of the Acute Services Building will be underway.

Graph 34

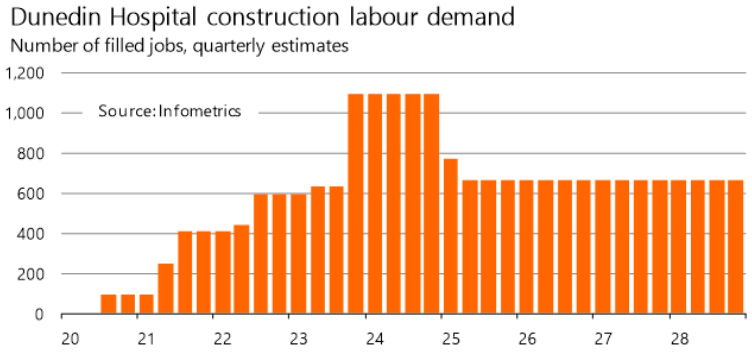


Table 1

Dunedin Hospital construction labour demand
Number of filled jobs, selected quarterly estimates

	Dec 21	Dec 24	Dec 27
Project builders	26	131	71
Carpenters	21	108	60
Construction project managers	16	64	36
Quantity surveyors	8	41	23
Builder's labourers	11	28	11
Electricians	9	12	18
Solid plasterers	0	12	20
Building associates	8	21	10
Scaffolders	0	43	0
Other	311	639	417
Total	411	1,099	666

Although Table 1 shows the occupations where we expect the greatest numerical effects on labour demand to occur, it risks missing some key areas where demand pressures will

[6] Our modelling does not attempt to fully replicate the typical "S-curve" associated with the timeline of construction projects. For example, it is likely that activity and employment will taper off more gradually in the latter part of 2028 as the Acute Services Building nears completion.

be particularly intense. For example, we estimate that the maximum number of scaffolders required for construction of the hospital at any point in time is 43, with an average of just 10 workers across the project's 8½-year timeline. However, these figures look far more significant when one considers that the number of people working as scaffolders in Dunedin under BAU conditions is forecast to be about 15, on average, between now and 2028. In other words, at its peak, construction of the new hospital could require an increase in scaffolder numbers in the city of 250-300%.

Table 2 details the 10 occupations with the most significant boost to construction labour demand in Dunedin caused by the hospital build. In some cases, such as quantity surveyors or construction project managers, both the absolute numbers required and the percentage increase to the BAU workforce are significant. But there are other occupations with a relatively small existing workforce that will require a sizable increase in numbers. Examples of these occupations include concreters and cement and concrete plant workers.

Table 2

Dunedin Hospital construction labour demand

Number of filled jobs, selected occupations

	Average, Sep 20 - Dec 28		Maximum, Sep 20 - Dec 28	
	Number	% of BAU employment	Number	% of BAU employment
Fencers	4	91%	8	160%
Scaffolders	10	66%	43	298%
Landscape gardeners	6	49%	9	81%
Quantity surveyors	21	42%	41	84%
Construction project managers	34	29%	64	58%
Fibrous plasterers	5	28%	9	49%
Solid plasterers	11	26%	20	47%
Cement and concrete plant workers	3	22%	9	66%
Concreters	5	22%	15	68%
Drillers	4	20%	10	59%

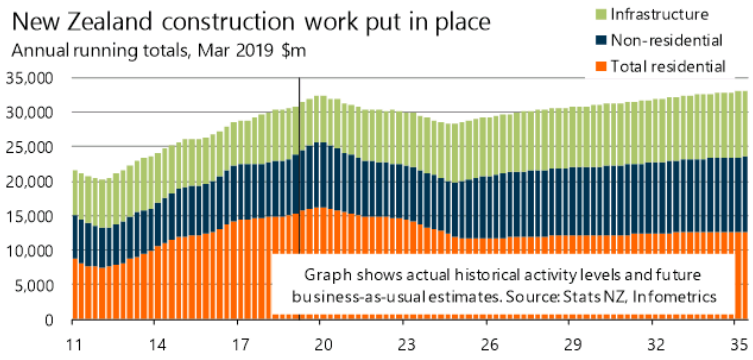
Nationwide construction activity and employment

Nationwide construction activity has expanded significantly since 2012 and is at a cyclically elevated level. Both residential and non-residential activity are forecast to ease over the next 2-5 years. However, demand for construction-related services associated with the larger population and building stock mean that this drop is unlikely to translate into any significant decline in construction employment. This outlook holds true for Auckland, despite the region's risk of a larger-than-average decline in activity once the current housing undersupply is addressed. In Canterbury, activity will continue to fall away from its post-quake highs, and there is potential for these spare labour resources to be utilised in Otago.

Construction activity

Total construction activity in New Zealand has expanded almost 50% since March 2012, with the volume of work now 11% higher than the previous peak recorded in early 2008. During this seven-year period, residential construction activity has more than doubled, while non-residential building work has increased 45% (see Graph 35). Growth in infrastructure activity has been more modest, although by mid-2018, the volume of infrastructure work had surpassed its previous peak reached in 2009.

Graph 35



The extent of this growth throughout much of the last decade provides important context for the construction activity outlook over the next five years. Infometrics forecasts declines in both non-residential and residential construction between 2019 and 2022.

A softer economic outlook, including slower growth in employment and spending, are predicted to drag non-residential activity down by about 15% over the next 2-3 years.

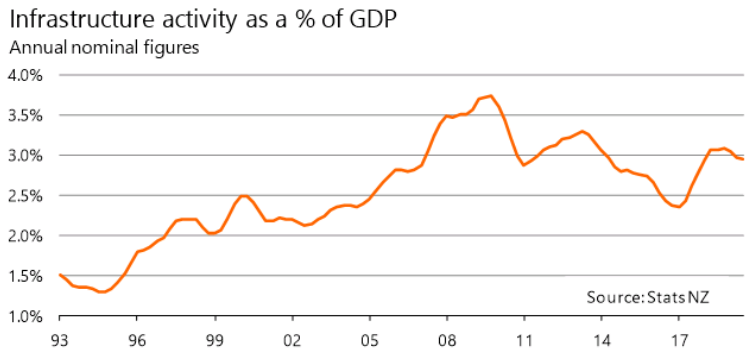
Easing population growth and an overvalued housing market are expected to place moderate downward pressure on house prices and slow the rate of new residential development. An undersupply of housing in some parts of the country, such as Auckland is likely to limit the extent of the residential downturn, with activity forecast to decline by an average of 3.4%pa over the three years to December 2022. However, unlike non-residential construction, declines in residential activity are expected to persist during 2023 and 2024 as these housing shortages are gradually addressed and underlying demand for new dwellings continues to ease.

Residential work put in place is forecast to bottom out during 2025. Population growth is expected to slow gradually over the medium term, averaging 0.8%pa between 2025 and 2035, and this trend will constrain longer-term growth in residential construction activity. Increases in alterations and additions work will outpace new residential building.

Our forecasts suggest that nationwide non-residential activity will be below "normal" by the middle of this decade and market conditions could be right for another pick-up in the construction of commercial and industrial space. Our medium-term outlook shows a gradual upward trend in non-residential work.

In contrast to the residential and non-residential subindustries, infrastructure activity is expected to increase over the next five years, with growth averaging 3.4%pa between June 2019 and June 2024. This forecast growth reflects the extent of infrastructure projects in the pipeline and the underinvestment in infrastructure that has occurred in recent years. Infrastructure investment was up at 3.7% of GDP in 2009 and 3.3% of GDP in 2013, but had dropped as low as 2.3% of GDP in early 2017 (see Graph 36).

Graph 36



Nevertheless, there are risks to this forecast growth in infrastructure activity. The election of the Labour-led government in 2017 resulted in changed infrastructure spending priorities, and the new government's projects have taken longer to get underway than was initially anticipated. Although these issues are expected to be resolved as projects move through the planning, consent, and design phases, the relatively slow progress to date indicates a risk that activity could continue to be weaker than expected in the near term.

Local government funding constraints also present downside risks to our infrastructure investment forecasts. Many local councils are already grappling with high debt levels

and are unable to take on further substantial borrowing. Councils' ability to put up rates to cover any funding shortfalls is also limited by a lack of public appetite for further rates increases. Since 2003, local authority rates across New Zealand have risen at an average of 5.6%pa, well in excess of overall consumer price inflation, which has averaged 2.1%pa.

Over the longer-term, we expect infrastructure activity to gradually increase, reflecting a mix of demand pressures caused by moderate population growth and the need to replace existing assets.

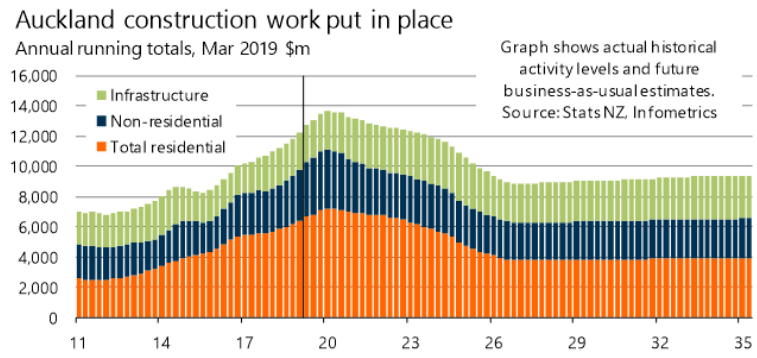
In overall terms, our nationwide construction forecasts predict a 12% decline in activity between the end of 2019 and the second half of 2024. Work is then forecast to slowly rise in subsequent years, although the economy's cyclical nature means that actual activity is likely to be less smooth than our trend forecasts would suggest. However, notwithstanding any cyclical ups and downs, it is worthwhile to note that total construction activity is not forecast to surpass its 2019 peak again until 2033. In other words, nationwide construction work is currently at an unusually high level, and once activity starts to ease, demand pressures are likely to be less intense for an extended period.

Although the nationwide outlook provides a good overview of future activity, additional insights can be gained by looking at forecasts for Auckland and Canterbury. Demand pressures in these two regions could have significant implications on the availability of construction workers for projects in Otago.

Auckland

Auckland accounted for 40% of total construction activity in the March 2019 year, up from 31% in 2010. Rapid population growth in the region over the last decade has led to strong demand for housing, and residential consent numbers have risen substantially in response to the region's housing shortage. Strong economic growth has fuelled an increase in non-residential activity, while major infrastructure projects have also been a key feature of the construction landscape.

Graph 37



Even with construction activity in Auckland forecast to peak in 2020, demand pressures are likely to remain relatively intense in the region between now and 2023 (see Graph 37). It appears unlikely that there will be any significant spare capacity in the region's

construction sector over the next 2-3 years. We note that a 25% reduction in non-residential activity in Auckland is forecast between December 2019 and June 2022, although the capacity effects of this decline are likely be mitigated by a 19% lift in infrastructure work over the same period.

Auckland's population growth is forecast to be slower over the medium term, averaging 1.2%pa between 2025 and 2035, compared to 1.9%pa over the last decade. This slower growth suggests that, once Auckland's current undersupply of housing is rectified, that residential construction activity is likely to hold at lower levels than we have seen in recent years. Over the medium term, this conclusion possibly implies softer demand pressures for construction workers in Auckland compared with the current peak in activity.

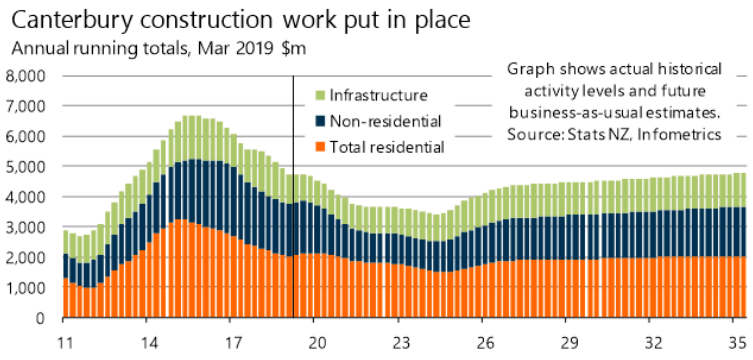
Canterbury

Construction activity in Canterbury in recent years has obviously been heavily influenced by rebuilding work following the 2011 Christchurch earthquake. Total activity in the region rose 150% over the four years to September 2015, accounting for three quarters of total nationwide growth in construction work during this period.

Residential and infrastructure activity in Canterbury both peaked in the first half of 2015, while non-residential work reached its highest level in the second half of 2016. By March 2019, total activity had contracted 29% from its peak. There is now considerable spare capacity in the region's construction industry, even allowing for the fact that some international workers have returned overseas, some workers (both domestically and internationally sourced) have moved to other regions such as Auckland, and some people who were temporarily drawn into the post-quake construction workforce have left the industry.

Construction activity in Canterbury is forecast to contract another 27% over the five years to June 2024 (see Graph 38). The bulk of this decline is expected in the non-residential subindustry, reflecting the fact that the residential subindustry is further through its "correction" phase as construction activity levels retreat from their post-quake highs. The likelihood of further spare labour capacity developing in the Canterbury construction industry has important potential implications for the Otago industry.

Graph 38



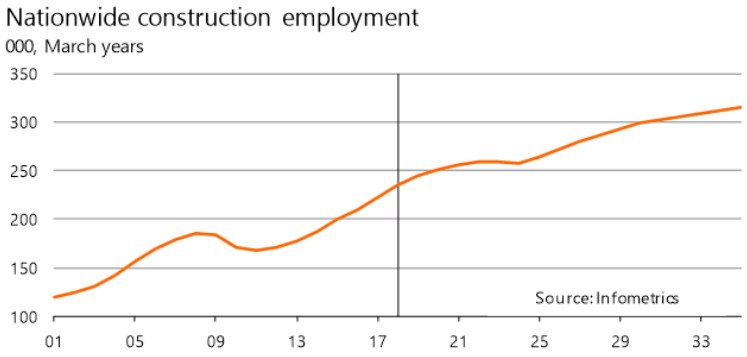
Infometrics

Our forecasts show a recovery in construction activity in Canterbury between 2024 and 2027. This pick-up comes about because construction activity in Canterbury is likely to be below "normal" in the near term given the unusually high investment levels in the region's housing and commercial building stock following the earthquake. However, the timing of any future sustained recovery in activity in Canterbury is uncertain, and the risk to our forecast is that this pick-up is delayed beyond 2025. Such an outcome would effectively imply softer demand for construction workers in Canterbury for a longer period.

Employment

Despite the expected decline in construction activity nationally between 2019 and 2024, employment in the construction industry is not expected to follow suit. Apart from a small dip during 2024, nationwide construction employment is forecast to increase throughout the next 15 years (see Graph 39). This trend reflects increasing demand for construction-related services associated with building maintenance as the population and building stock continue to expand.

Graph 39



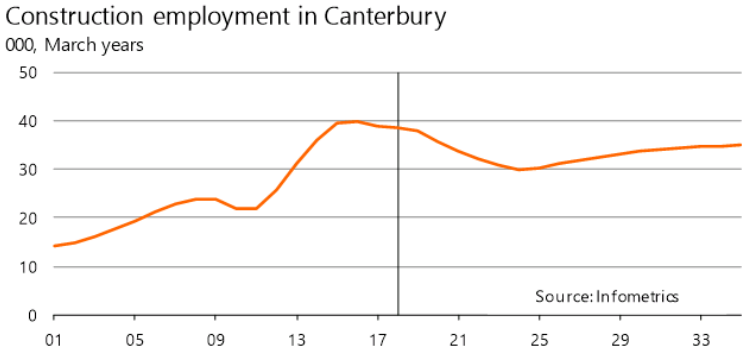
The rate of employment growth over the medium term is expected to be slower than we have seen in previous years, when there has been very strong growth in construction activity at times. For example, total employment in the construction industry expanded by 80% (an average of 4.0%pa) between 2003 and 2018. In comparison, growth is forecast to total just 25% over the 15-year period between 2020 and 2035, equating to an average growth rate of 1.5%pa.

We have seen that both Canterbury and Auckland are expected to experience larger declines in construction activity over the next few years. This outlook raises the possibility that spare labour resources could develop within each of the two regions as construction work slows.

Our data for Canterbury shows that construction employment peaked in 2016 and had eased an estimated 4.5% by 2019. This relatively small decline in employment to date can be partly explained by the expanding population and building stock and increased maintenance requirements noted above. However, it is also likely that firms have been slow to adjust to the shrinking market and have avoided laying off staff as much as

possible. With further declines in construction activity forecast over the next four years, pressure on construction businesses in Canterbury is expected to intensify, leading to more substantial job losses (see Graph 40).

Graph 40

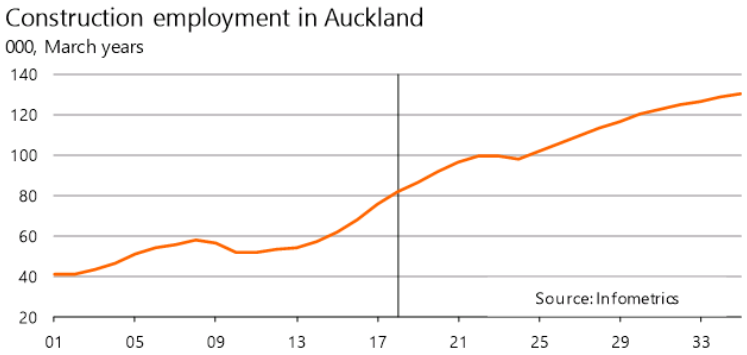


Between 2020 and 2024, construction employment in Canterbury is forecast to drop by another 17% (almost 6,000 workers), taking employment to its lowest level since 2012. Even with a gradual trend of recovery in subsequent years, construction employment in the region in 2035 is still predicted to be below its 2020 level.

We believe that, over the next five years in particular, Canterbury shapes as a potential source of construction workers for other regions where demand for workers is continuing to increase.

Auckland's forecast decline in construction activity is less pronounced than Canterbury's drop-off, an outcome that is also reflected in our forecasts for construction employment in the region. Throughout the 15-year forecast period, Auckland is only expected to suffer a fall in construction employment once, during 2024 (see Graph 41).

Graph 41



The fact that Auckland is expected to avoid any significant decline in its construction labour force is indicative of the region's population growth. Although Auckland's population growth is predicted to slow over the medium term, it is likely to remain above the nationwide average. This continuing increase in the number of people and buildings in the region will sustain demand for workers. As a result, Auckland looks unlikely to develop significant spare labour capacity in the construction industry and does not appear to be a potential source of workers for other regions with high demand, such as Otago.

The role of migration

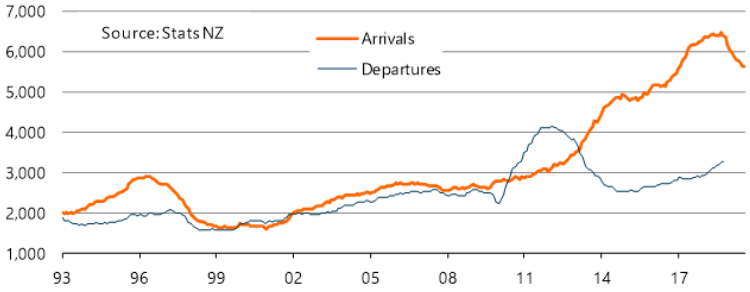
Immigration has played an important role in meeting labour demand in New Zealand over the last decade. Earthquake rebuilding work in Christchurch is a clear example where foreign workers have contributed to the construction industry. Government policy changes in recent years have aimed to reduce net migration, while still allowing employers to access workers from overseas through a more targeted approach. Changes to work visa rules, combined with the attractiveness of Queenstown to people from overseas, imply that foreign workers could help meet demand for labour in the area's construction industry. The urban nature of Dunedin suggests that foreign workers could also play a role in meeting demand for labour in the City if required.

Workers from overseas have played a growing role in the New Zealand labour force throughout the last decade as net migration pushed up to record highs. This trend was particularly prevalent in the construction industry, partly driven by demand for labour associated with rebuilding work following the 2011 Christchurch earthquake. Stereotypically, builders and labourers from Ireland and the Philippines made a significant contribution to the rebuild. There was also a sizable number of people from western European countries, including France and the UK, who took up highly skilled roles such as structural engineers.

Graph 42

International migration flows of construction workers

Annual running totals based on arrival and departure cards



Graph 42 shows international arrival and departure numbers for a grouping of selected construction occupations[7] over the last three decades. Annual arrival numbers for people in these occupations more than doubled between the end of 2011 and September 2018, boosted by strong demand for workers in the industry, initially as a result of earthquake rebuilding work in Christchurch. Weaker business conditions in

[7] The occupations included in this grouping are construction, distribution and production managers; architects, designers, planners and surveyors; building and engineering technicians; bricklayers, carpenters and joiners; floor finishers and painting trades workers; glaziers, plasterers and tilers; plumbers; electricians; and construction and mining labourers.

Australia's mining industry are also likely to have helped increase arrival numbers, given that many construction workers moved to Australia in search of work when construction activity fell away in the wake of the Global Financial Crisis.

With New Zealand's construction activity forecast to peak during 2020, one might expect that the capacity constraints within the industry at a nationwide level will start to ease. However, we note that demand for workers within the industry is influenced by both the volume of construction activity taking place and the size of the population or building stock. A significant proportion of work in subindustries such as plumbing relates to maintenance, rather than the construction of new buildings. So with the drop-off in nationwide construction activity over the next few years expected to be relatively mild, it is possible that skill shortages will persist, maintaining pressure on training numbers and encouraging businesses to consider looking overseas to fill vacancies.

Government migration policy changes

The previous National government made changes to migration policy during 2016 and 2017. The residence visa approvals target was lowered in late 2016, while conditions for work visas were tightened in the second half of 2017.

In 2018, the current Labour-led government added restrictions on international students who want to remain in New Zealand and work when their study is completed. These changes have been followed by the announcement in September 2019 of the replacement of six work visa categories with a single temporary work visa by 2021.

The most recent work visa changes are particularly pertinent for Dunedin and Otago as they represent a significant change from previous migration policy. *Appendix: Government migration policy* (p79) details the requirements for employing migrant workers under the new visa, which will differ between Dunedin and the rest of Otago.

For people being paid at or over the median wage (currently $25/hr), there will be virtually no restrictions on employing migrant workers in Otago outside Dunedin, and migrants will be able to renew their visa after three years. In contrast, employers in Dunedin will only be able to hire migrant workers if their job is on a skill-shortage list or they have met the labour market test showing they have not been able to recruit New Zealanders to do the job.

At this stage, the clear divide between Dunedin and the rest of the Otago implies that construction firms in Queenstown, for example, will be able to employ migrant workers much more easily than construction firms in Dunedin. This disparity might be reduced by the inclusion of construction occupations on the skill-shortage list for Dunedin that will be created when the new system is implemented.

The government has also indicated that a sector agreement might be drawn up for the construction industry to make it easier for firms to employ migrant workers, particularly in lower-paid roles. Such an agreement would help further reduce the difference in rules around migrant workers between construction firms in Dunedin and Queenstown.

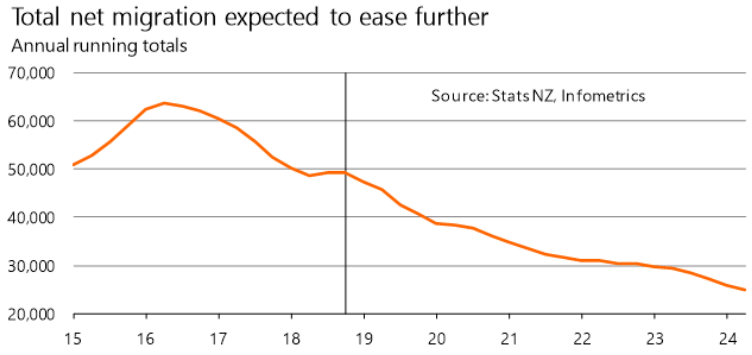
The nationwide migration outlook

We expect that slowing economic growth in New Zealand will drag net migration lower over the next 3-4 years. Softer employment growth will make New Zealand a less attractive destination for immigrants. With Australia's economic growth also expected to

pick up during 2020, the net outflow of New Zealanders is likely to continue increasing, as has been the case since the end of 2016.

We forecast that total net migration will gradually ease towards a net inflow of 25,000-30,000 people per annum by 2024 (see Graph 43). This lower level reflects reduced residence approval numbers, some weakness in foreign education due to the global economy and domestic policy changes, greater restrictions on work visas (including more "churn" as lower-skilled people on work visas are forced to leave after three years), and a greater outflow of New Zealanders heading to Australia.

Graph 43



Nevertheless, the risks to this forecast are on the upside. Despite both Labour and NZ First campaigning on reduced migration numbers in the lead-up to the 2017 election, the immigration policy changes implemented to date have been relatively muted. For example, the work visa changes announced in September 2019 have potentially made it a little more difficult for foreign migrants to settle and work in Auckland and other key cities, but the policy arguably places less restriction on foreign migrants looking to settle and work around the rest of the country.

The government's planned changes to work visa rules are detailed in *Appendix: Government migration policy* (p79). This Appendix also contains a list of construction occupations currently included on Immigration NZ's various skill shortage lists, providing an indication of how open central government policy is presently to allowing the construction industry to source workers from overseas.

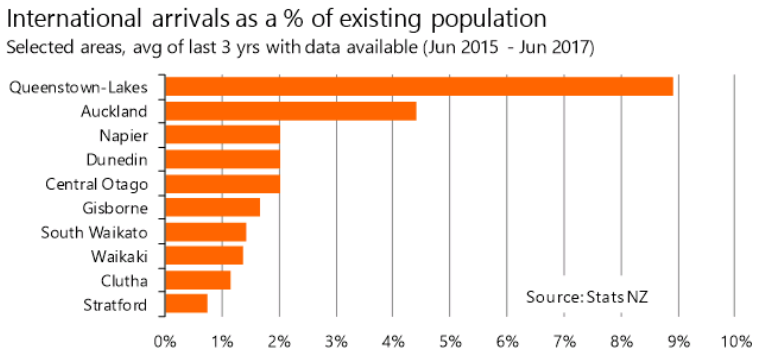
Migration's role in Otago

The propensity of migrants moving to New Zealand to settle in different parts of the country varies greatly. Relative to the size of its population, Queenstown-Lakes attracts more than double the number of permanent and long-term arrivals of the next-ranked local authority, Auckland (see Graph 44). The other areas that attract a relatively high number of immigrants as a proportion of their population tend to be the larger urban centres or areas where tourism makes a significant contribution to economic activity. As a result of these drivers, Dunedin and Central Otago also rank relatively highly.

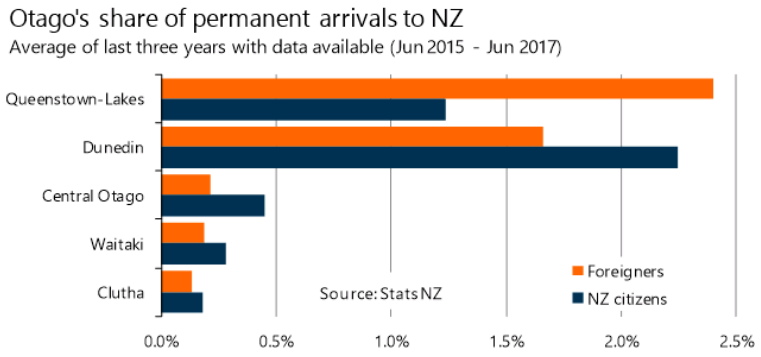
If we separate out New Zealand citizens returning after living overseas for more than a year, we see that Queenstown-Lakes' share of total foreign migrants is significantly

higher than its share of returning Kiwis (see Graph 45). For all other local authority areas in Otago, their shares of returning Kiwis are higher than their shares of foreign migrants, although these results are skewed by the high propensity of foreign migrants to initially settle in Auckland. If we concentrate only on immigrants choosing to settle outside Auckland, then we find that, within Otago, only Central Otago appeals significantly more to returning New Zealanders than to foreign migrants (see Graph 46).

Graph 44

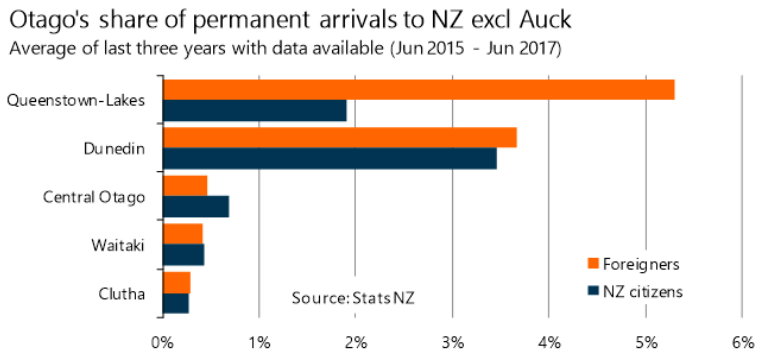


Graph 45



These results suggest that, subject to broader migration policy settings, Queenstown-Lakes and Dunedin should experience little difficulty in attracting foreign workers if required.

Graph 46


Otago's share of permanent arrivals to NZ excl Auck
Average of last three years with data available (Jun 2015 - Jun 2017)
Queenstown-Lakes
Dunedin
Central Otago
Waitaki
Clutha
Source: Stats NZ
Foreigners
NZ citizens
0%
1%
2%
3%
4%
5%
6%

Potential effects of automation on demand

Automation and the increased adoption of technology are important considerations when forecasting demand for workers over the next 15 years. Demand for workers in many construction roles is likely to be reduced as businesses use more labour-saving equipment over the medium term. This adoption of technology is likely to occur gradually, meaning that the ability to address near-term demand pressures might be limited. Nevertheless, the scale of the Dunedin Hospital project provides scope for innovative construction approaches to be utilised.

In our 2018 report *From education to employment: Megatrends affecting NZ's working environment*,[8] Infometrics examined the potential effects of automation on New Zealand's labour force over the next 20 years. The report's focus was on the possible job losses associated with the rapid uptake of technology in the workplace, the disruptive effect of those changes for workers, and the likely creation of new roles as the mix of occupations within the economy evolves.

Having done this work, we are able to estimate the possible effects of automation on specific occupations within the construction industry. Our other modelling work for this project shows there are likely to be considerable labour demand pressures in Otago's construction industry in coming years. By incorporating the effects of automation, we can gain insights into which roles have the greatest potential for those demand pressures to be alleviated by technological advancements.

The variation in the effects of technology on different occupations reflects that some roles require a greater degree of human input, or judgment, than others. Table 3 shows our estimated levels of employment for construction-related occupations across Otago in 2035 under BAU conditions and under a scenario with more rapid adoption of technology.

The following key points can be extracted from Table 3.

- With the adoption of increased technology, over half the potential jobs in 2035 under BAU conditions could be disestablished for occupations such as paving plant operators, earthmoving plant operators, and excavator operators.
- There are also many occupations where automation could see between 10% and 30% of roles disestablished by 2035. For some occupations, such as cement and concrete plant workers or bricklayers, this increased use of technology could see the number of employees decline over the next 15 years.
- Increasing demand for construction-related services means that there are some occupations where technology could play a significant role in reducing labour

[8] https://static.infometrics.co.nz/Content/Infometrics_Megatrends_2018.pdf, p9-14.

requirements, but employment in 2035 is still projected to be higher than it is currently. These occupations include builder's labourers and wall and floor tilers.

- There are several occupations where automation potentially has a limited or negligible effect on employment. It is even possible that the adoption of technology across the broader economy could lead to an increase in employment in some roles, as labour resources are freed up from having to take on low-level tasks and are able to be diverted towards more highly skilled activities. We have denoted these occupations with "NA" in Table 3.

Table 3

Employment, BAU vs accelerated automation

Number of filled jobs, construction occupations

	2019	BAU 2035	Automation 2035	Difference from 2019	Difference from 2035 BAU
Paving plant operator	48	52	22	-54%	-58%
Earthmoving plant operator	64	53	24	-63%	-55%
Excavator operator	232	262	119	-49%	-55%
Driller	61	75	53	-13%	-29%
Concreter	65	75	58	-11%	-23%
Roof tiler	138	159	126	-9%	-21%
Fencer	139	158	126	-9%	-20%
Cement/concrete plant worker	37	40	32	-14%	-20%
Builder's labourer	679	858	691	2%	-19%
Bricklayer	120	125	104	-13%	-17%
Floor finisher	147	170	142	-3%	-16%
Painting trades worker	546	622	521	-5%	-16%
Wall and floor tiler	84	101	85	1%	-16%
Fibrous plasterer	96	79	69	-28%	-13%
Solid plasterer	225	224	196	-13%	-13%
Landscape gardener	182	203	183	1%	-10%
Glazier	81	103	93	15%	-10%
Carpenter	715	899	814	14%	-9%
Scaffolder	64	80	77	20%	-4%
Electrician (general)	822	1,012	978	19%	-3%
Telco technician	72	85	83	15%	-2%
Plumber (general)	419	476	NA	NA	NA
Drainlayer	127	148	NA	NA	NA
Building associate	166	196	NA	NA	NA
Aircon/refrigeration mechanic	51	67	NA	NA	NA
Project builder	1,773	1,560	NA	NA	NA
Construction project manager	276	349	NA	NA	NA
Quantity surveyor	141	197	NA	NA	NA
Electrical line mechanic	59	70	NA	NA	NA

The rate at which technology is adopted across the economy is determined by a range of factors but, from an individual business' point of view, arguably the single most

important consideration is the relative cost of technology versus labour as an input to production. In simple terms, if the cost of a machine over its expected productive life is lower than the cost of paying workers to produce the same output, then a business is probably going to be willing to invest in the machine. Of course, there are other factors such as financing costs, confidence in the technology, confidence in the economic outlook, and the rate of technological obsolescence that can all affect the decision-making process. But in the long run, the relative costs of production are the key driver of the decision to invest in capital equipment or labour.

With an unemployment rate of 4.2%, New Zealand's labour market is currently reasonably tight. In general, forecasters expect the labour market to remain tight over the medium term, with slowing population growth and the aging population keeping a lid on the number of unemployed people. Conditions are likely to be conducive for upward pressure on wages given the relatively tight labour market.

In an environment of technological advancement and rising wage costs, there is likely to be a considerable incentive for firms to invest in labour-saving equipment to facilitate their growth and remain competitive.

This process of technological adoption is likely to be a gradual one. In contrast, one of the clear outcomes from our modelling of construction activity and worker demand in Otago is that, given the major projects in the pipeline, labour demand pressures will potentially ramp up very rapidly in the near term. At an industry-wide level, greater adoption of technology is likely to play more of a role in alleviating these pressures over the medium term than in the short term.

Nevertheless, even with technology only being gradually adopted, there is potential for large projects to influence the rate of uptake. For example, the magnitude of the Dunedin Hospital replacement and its labour requirements provide scope for innovative construction solutions to be utilised earlier than might otherwise have been the case. Once this technology has been introduced, it is more likely to be reused or replicated for other projects in Dunedin, Otago, or around the rest of New Zealand.

The effects of major construction projects on the housing market

The Otago Corrections Facility and Forsyth Barr Stadium are two major construction projects that have taken place in Otago within the last 20 years. These projects offer potential insight into the flow-on effects of significant demand for construction workers on the area's housing market. This section examines each of these projects and concludes that there is potential for a shortage of housing in Dunedin to drive up rents and house prices in the city. The effects are likely to be less marked than they were in Clutha when the prison was built between 2004 and 2007. However, the longer construction timeline associated with Dunedin Hospital could see the city's housing market remain tight for longer.

Otago Corrections Facility, Clutha

Data shows that the construction of the Otago Corrections Facility near Milton had clear effects on the area's housing market. These effects are evident in both rental data and house sales and prices data.

Rental inflation

We have benchmarked residential rental inflation in the Clutha District against rental inflation in three other groupings of territorial local authorities.

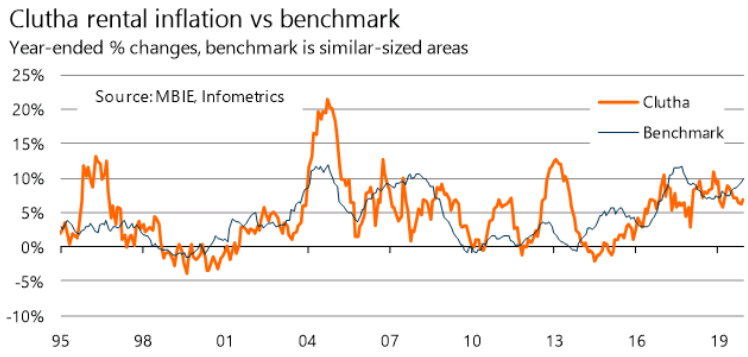
- Neighbouring areas: Central Otago, Dunedin, Southland District, and Gore
- Similar-sized areas (as at 2006): Hauraki, Rangitīkei, Tararua, and Central Otago
- Areas with similar levels of urbanisation (as at 2006):[9] Kaipara, Hauraki, Matamata-Piako, and Western Bay of Plenty

This benchmarking process allows us to abstract from any strength in rental inflation due to factors that are not specific to the Clutha District. For example, housing demand throughout much of New Zealand was relatively strong during the middle part of last decade due to above-average population growth and an international surge in demand for coastal property. We do not want to confuse the effects of these demand factors with pressures caused by demand associated with construction workers for the Otago Corrections Facility.

Graph 47 compares rental inflation in Clutha against the second of the benchmarks outlined above. We have chosen the second benchmark for this comparison because it is, in general, the most closely correlated with rental inflation in Clutha.

[9] Defined as the ratio of the population in the area's largest urban centre to the total population of the territorial local authority

Graph 47



Graph 47 shows several periods when rental inflation in Clutha varies significantly from benchmark rental inflation. These other divergences mean it is impossible to be definitive about the effects of the prison construction on Clutha's rental market. Nevertheless, we note that rental inflation in Clutha was substantially higher than the benchmark between January 2004 and September 2005, averaging 18.1%pa, compared to 8.6%pa across our benchmark of similar-sized areas.

Data at an area unit level confirms this upward pressure on rents. Rental inflation in the Milton area unit averaged 10.1%pa between June 2002 and June 2007, compared to 5.9%pa nationally, and got as high as 16%pa during 2004. In the surrounding Bruce area unit, which is largely rural, rental inflation averaged 13.0%pa between June 2003 and June 2007, compared to 5.6%pa across all New Zealand, peaking at 31%pa during 2004.

The temporary nature of this outperformance by rental inflation in Clutha is also confirmed in later data. Over the two years to December 2007, rental inflation in the District eased to an average of 5.5%pa. Although this rate of increase was still relatively strong, it failed to keep pace with the average growth of 9.7%pa recorded across our benchmark areas. In other words, the strong rental inflation that continued throughout 2006 and 2007 in other provincial parts of New Zealand was not seen in Clutha, with demand for rental accommodation appearing to wane as the prison construction neared completion.

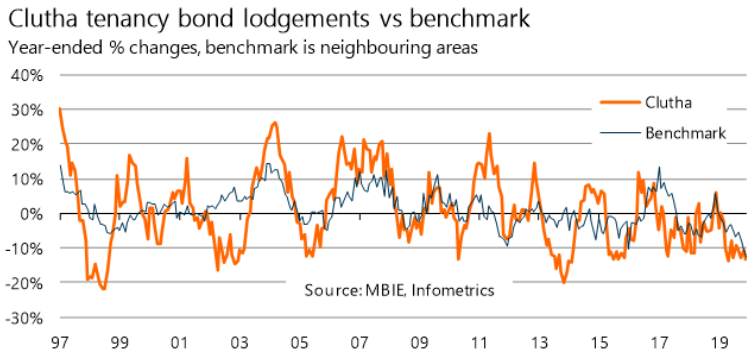
Rental bond numbers

Tenancy bond lodgement numbers provide moderate evidence of a surge in demand for rental accommodation in Clutha around the time of the prison construction. Growth in bond numbers in Clutha was higher than in our chosen benchmark (neighbouring areas) between October 2003 and October 2004, peaking at more than 27%pa in March 2004 (see Graph 48). After a soft patch throughout much of 2005, growth in bond numbers picked up again and was stronger than in neighbouring areas between November 2005 and March 2008.

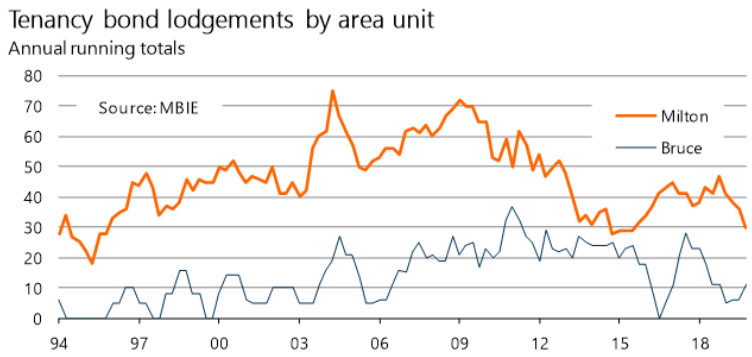
Area unit data provides more definitive evidence of a surge in letting activity during 2004. The number of bonds lodged in the Milton area unit rose from 40 in the March 2003 year to 75 in the June 2004 year (see Graph 49). The Bruce area unit recorded a

similar lift from five bonds in the September 2003 year to 27 in the September 2004 year.[10]

Graph 48



Graph 49



The decline in bond lodgement numbers in Clutha between the second half of 2004 and the second half of 2005 is consistent with the area's stock of rental accommodation being occupied by construction workers. It is also consistent with the strong rental inflation recorded during this period, with other people who were looking for rental accommodation in the area forced to pay higher rents due to the reduced supply of available properties.

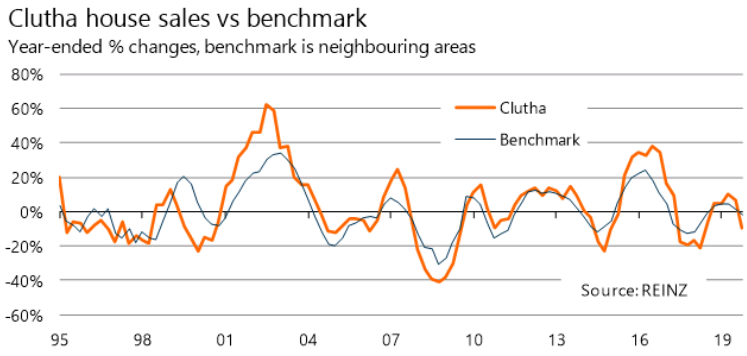
House sales

House sales data also provides moderate evidence of an increase in purchaser demand for housing around the time of the prison's construction. The annual total of house sales

[10] We note that the figure for the Bruce area unit in the September 2003 year is probably understated. The Ministry of Business, Innovation and Employment suppresses bond data for any quarter where fewer than five bonds were lodged. However, this suppression does not alter the fact that there was still an increase in bond numbers in the Bruce area unit over the following year.

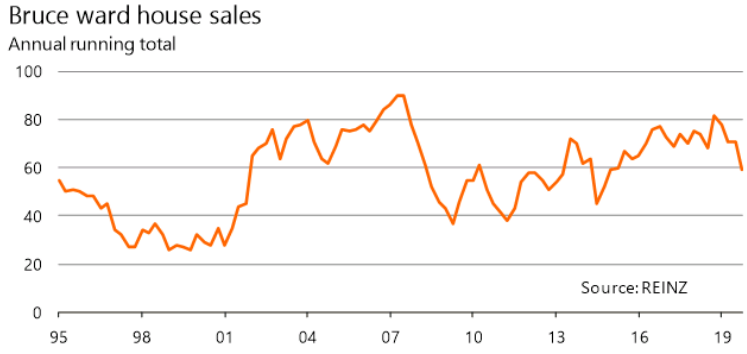
in Clutha increased from 136 in September 2000 to 367 by March 2004, although we note that about half of this lift occurred before Milton was announced as the proposed site for the new prison in about June 2002. Nevertheless, over the four-year period between June 2000 and June 2004, growth in house sales in Clutha averaged 26.1%pa, compared to growth of 13.7%pa across our benchmark of neighbouring areas (see Graph 50).

Graph 50



House sales volumes within the Bruce ward[11] follow a similar pattern to activity in the broader Clutha District. The annual sales total lifted from 28 in March 2001 to 68 by June 2002 and reached a peak of 80 in March 2004 (see Graph 51). Sales volumes edged down during the remainder of 2004 but recovered to a peak of 90pa by mid-2007. The timing of this latter pick-up in sales suggests that contractors sold properties once the prison's construction was completed – a thesis that can be tested by looking at house price movements in the area.

Graph 51

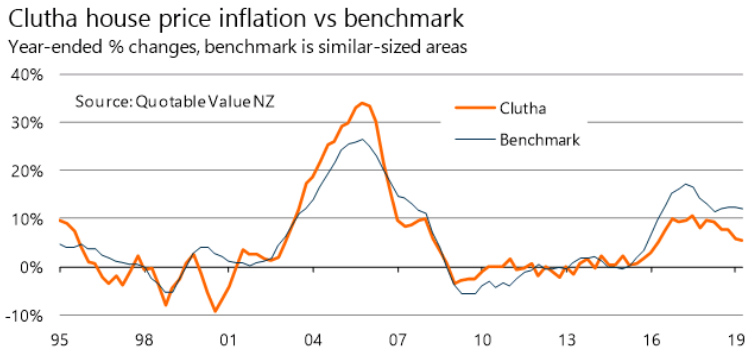


[11] The Bruce ward covers a slightly smaller geographic area than the Bruce area unit, but also includes the Milton area unit.

House prices

House price inflation in Clutha averaged 23.1%pa over the four years to September 2006, peaking at 33.9%pa in the final quarter of 2005 (see Graph 52). During this period, house price inflation in the District was consistently stronger than across our benchmark of similarly sized areas, where it averaged 19.8%pa.

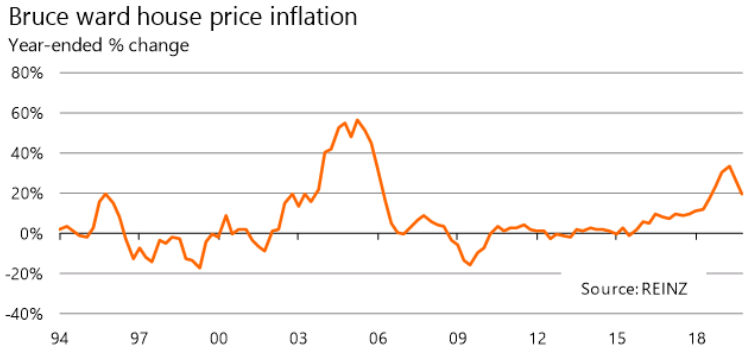
Graph 52



The gap between these two rates of growth is relatively small, and reflects that provincial areas throughout New Zealand were experiencing a period of very strong house price inflation. Nevertheless, the fact that annual price growth in Clutha was running 7-9 percentage points above our benchmarks in late 2005 and early 2006 suggests that the District was encountering demand conditions that were unusually strong, even in the context of the wider national picture.

The effect of the prison's construction on demand for housing appears to be confirmed by the fact that the Real Estate Institute of NZ's (REINZ) house price index for the Bruce ward rose at an average of 32.6%pa between June 2002 and June 2006. Year-end house price growth peaked at an astonishing 56.4%pa in June 2005 (see Graph 53).

Graph 53



Backing up our assessment of the prison's construction on the housing market, house price inflation in Clutha had slowed to 8.3%pa by June 2007. Although house prices were still increasing, the rate of growth had slipped well below house price inflation in our similarly sized benchmark areas, which was still up at 14.4%pa as the tail end of the property boom continued in provincial parts of New Zealand. In the Bruce ward, a small decline in house prices was recorded in early 2007. These results are consistent with an increase in the number of houses for sale as construction on the prison was completed. A larger correction in property values was probably averted by the housing needs of people moving into the area to work at the newly completed prison.

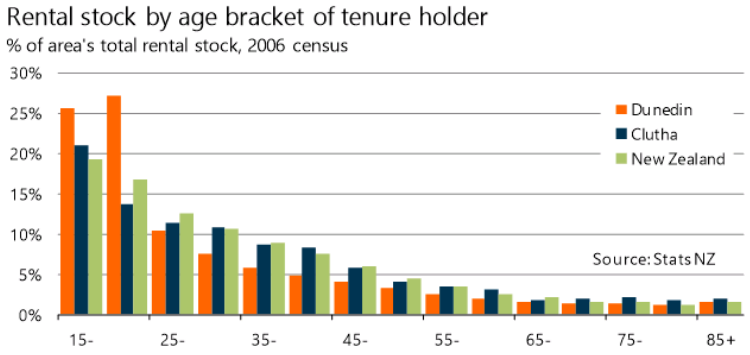
Forsyth Barr Stadium, Dunedin

The Otago Corrections Facility and Forsyth Barr Stadium were construction projects of relatively similar sizes (approximately $239m and $269m respectively in March 2019 prices). Although the effects of the prison construction project in Milton are clearly apparent in housing market data, it is not as easy to see the effects of the stadium construction project in Dunedin. There are three reasons for this difference.

Firstly, if we assume that there were similar workforce requirements across the two projects, the influx of workers would have had a much more noticeable effect on the Clutha housing market than on the Dunedin market. The relative size of the two areas clearly backs up this conclusion. Clutha's population of 17,400 and dwelling stock of 7,800 homes in December 2004 is less than one-sixth the size of Dunedin's population (122,400) and dwelling stock (48,300) in June 2009.

Secondly, rental housing makes up a larger share of the housing stock in Dunedin than in Clutha (31.4% in Dunedin in 2006, compared with 28.2% in Clutha). Even more important than the difference in the size of the rental stock is the nature of that housing. Graph 54 shows that 53% of rental housing in Dunedin at the 2006 census was occupied by people aged 15-24, reflecting the City's large student population. In contrast, the comparable figure for Clutha was 35%, which is close to the nationwide average. Although renters in the age bracket between 15 and 24 years old could also include young workers, we believe that trends in Dunedin's rental market are likely to be dominated by demand from students.

Graph 54



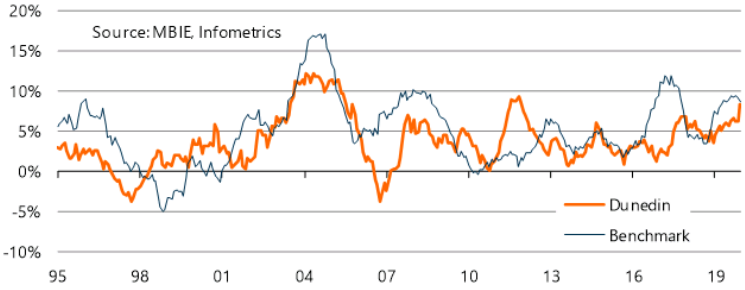
Thirdly, economic conditions and activity in the construction sector were very different in the 2005-2007 period, when the prison was built in Clutha, and 2009-2011, when the stadium was built in Dunedin. Construction activity in Otago was already at a record high in the second half of 2004, before construction on the prison started, and increased another 15% over the 15 months to March 2006. This growth resulted in strong demand pressures and a need for more workers, particularly in Clutha, where activity trebled over the same period.

In contrast, building activity in Otago had already dropped 9.6% in the year before work began on Forsyth Barr Stadium in mid-2009, and declined a further 13.8% by the time the stadium was completed in the second half of 2011. Although construction activity in Dunedin expanded almost 20% during this two-year period, the demand pressures caused by the stadium's construction were much less intense than would have been the case if economic conditions were more "normal" and the Global Financial Crisis had not occurred.

Graph 55

Dunedin rental inflation vs benchmark

Year-ended % changes, benchmark is neighbouring areas

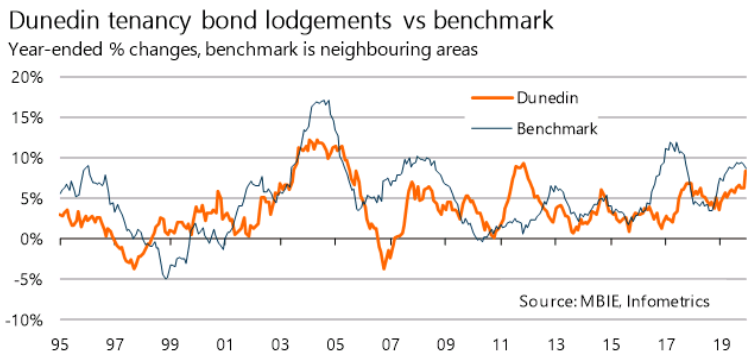


The lack of any clear effect of the stadium's construction on Dunedin's housing market, due to the reasons we have outlined, means we are not going to provide in-depth coverage of the housing market variables around the time of construction. However, we offer the following summary observations.

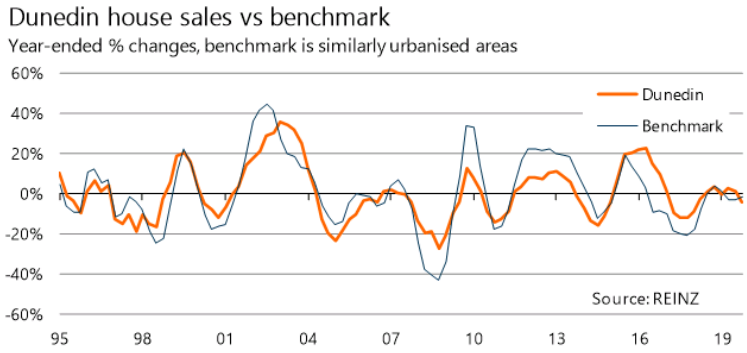
- Average rents in Dunedin rose 5.6%pa between August 2008 and July 2012, compared to 2.1%pa in neighbouring areas (Waitaki, Central Otago, and Clutha). Looking at other periods, this variation in rental inflation against our benchmark is not unusual (see Graph 55). We also note that the demand pressures caused by the stadium's construction would no longer be a contributing factor to above-average rental inflation from mid-2011 onwards.
- There was no discernible increase in bond lodgement numbers around the time of the stadium's construction (see Graph 56).
- House sales volumes in Dunedin were less variable between 2008 and 2011 than in our benchmark areas (similarly urbanised areas: Auckland, Palmerston North, Upper Hutt, and Invercargill). Despite activity in Dunedin being less variable, sales activity generally followed the same trend as in the other areas (see Graph 57).

- House price growth in Dunedin rebounded from -7.7%pa in March 2009 to 5.3%pa by June 2010. This pick-up was not mirrored in neighbouring areas, which recorded an average 1.4% drop in house prices over the year to June 2010 (see Graph 58). Although the correlation between house prices in Dunedin and our various benchmarks is generally strongest with the City's neighbouring areas, the 2010 rebound in price growth was seen in other urban centres around the country. As such, the 2010 result appears to reflect a divergence between the performance of house prices in urban and provincial areas in the wake of the Global Financial Crisis, rather than any unusual strength in Dunedin's house prices.

Graph 56

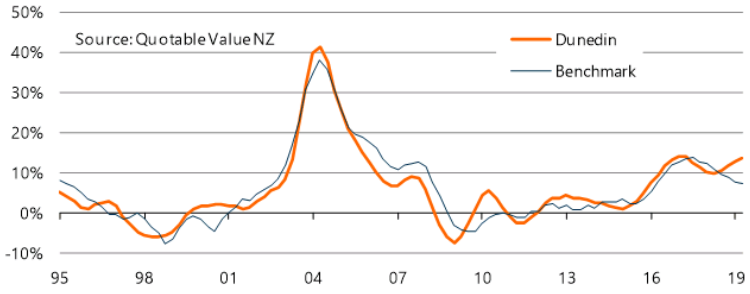


Graph 57



Graph 58

Dunedin house price inflation vs benchmark
Year-ended % changes, benchmark is neighbouring areas



Implications for Dunedin's Hospital build

It would be easy to look at the performance of Dunedin's housing market when Forsyth Barr Stadium was constructed and conclude that the upcoming hospital build could have a similar negligible effect on the market. However, the vast difference between current economic conditions and those that prevailed between 200 and 2011 means that a more noticeable effect on Dunedin's housing market cannot be ruled out this time around.

Perhaps most critically, we have seen an acceleration in Dunedin's house price inflation since mid-2018 that has not occurred in any of our comparable benchmarks. REINZ price data, which is more up-to-date than Quotable Value's index that is shown in Graph 58, suggests that this divergence has continued throughout the second half of 2019. Anecdotally, this pick-up in house price growth is being linked to pre-emptive demand for housing ahead of the hospital's construction, although there is no firm evidence to back up this assertion.

We note that, to date, the growth in house prices has not been matched by any unusual pick-up in sales volumes, which would normally be the case.

Rental data for November and December 2019 also shows a sharp pick-up in rental inflation in Dunedin. On a month-to-month basis, rental data can be quite volatile, so we are cautious about reading too much into the numbers yet. Nevertheless, any increase in rental inflation that is sustained into 2020 would be consistent with the city's rental stock already starting to be squeezed in anticipation of accommodation demand associated with the hospital's construction.

In our view, the much larger size of Dunedin's housing stock, compared to the housing stock in Milton or the Clutha District, implies that the effects of additional housing demand arising from the hospital's construction are likely to be more muted in Dunedin. However, we believe that the very weak economic conditions between 2009 and 2011 dampened the effect of Forsyth Barr Stadium's construction on the city's housing market. There already appears to be early evidence of a noticeable pick-up in house price and rental inflation in Dunedin.

Our modelling shows that employment associated with the replacement of Dunedin Hospital is expected to gradually increase from mid-2020 to mid-2022, with a substantial spike in worker numbers between late-2023 and the end of 2024 when construction of both hospital buildings is at full pace. Bearing this timeline in mind, there is potential for rental and house price inflation in Dunedin to be sustained at above-average levels through until 2023 as worker demand for accommodation in the city continues to increase. During the next 4-5 years, we estimate that house price inflation in Dunedin could be maintained at 2-3 percentage points above the nationwide average. Rental inflation of up to five percentage points above the national average is also possible.

Once the Ambulatory Services Centre is completed at the end of 2024, a reduction in worker numbers once could take some heat out of the city's housing market. However, we note that total worker numbers between 2025 and 2028 are estimated to be similar to the numbers required during 2023 in the lead-up to peak demand for workers. As a result, any significant weakness in Dunedin's housing market is unlikely to occur until 2028/29, as construction of the Acute Services Building is completed.

The size of any housing market correction in Dunedin in 2029 will be determined by the extent of the market's boom during the first 3-4 years of construction. The magnitude of any lift in residential building activity that accompanies this housing boom will also affect how much of an oversupply the Dunedin housing market has as worker demand for accommodation declines once the hospital's construction has been completed.

Appendix: Approaches to estimating BAU

This section details our approach to estimating business-as-usual levels of residential and non-residential construction activity for the local authority areas in Otago, and infrastructure activity at a region-wide level. Our residential projections consider a wide range of variables including population growth, household formation rates, the size of the dwelling stock, and the size of the economy in each area. Benchmarks for non-residential activity are more limited, and we have primarily compared construction work to the size of the economy. The size of the economy, along with population growth, are our key variables for creating a benchmark of infrastructure activity.

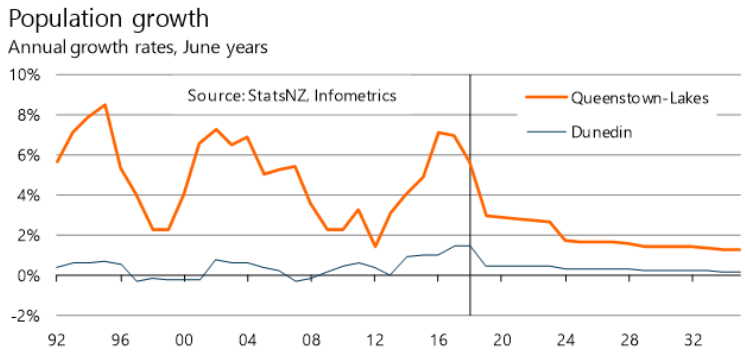
In detailing our range of approaches in the following sections, we have particularly focused on the implications for activity in Dunedin and Queenstown-Lakes. These areas are the two largest contributors to construction activity in Otago, but also demonstrate very different trends in activity. Queenstown-Lakes has a smaller population and economic base than Dunedin but is growing more rapidly on both counts. This divergence has important implications for construction activity in the District over time.

Residential consents

A: Population growth

An expanding population is the most obvious driver of increased demand for housing and the need for new residential construction activity. Graph 59 shows historical and projected population growth for Dunedin and Queenstown-Lakes.

Graph 59



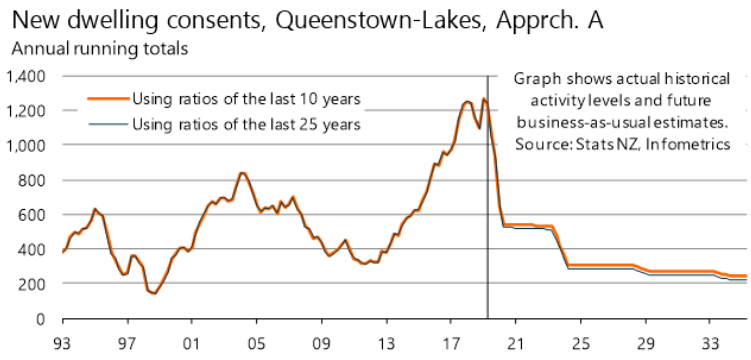
The population projections are based on Stats NZ's updated 2013 base subnational medium population projections, published in 2016. Subsequent to releasing these projections, Stats NZ has published subnational population estimates up to June 2019.

Where these estimates differ from the projections previously published, we have amended the future projections to reflect the higher or lower starting points. In other words, we have effectively assumed that the population growth rates projected by Stats NZ in future years remain appropriate.

In choosing Stats NZ's medium projections, we recognise that population growth across New Zealand has generally been higher than expected over recent years. We have considered using Stats NZ's high population projections or a hybrid of the high and medium projections. However, given recent revisions to nationwide population estimates, changes to the methodology for estimating net international migration, and the absence of final population data from the 2018 census, we are comfortable with using Stats NZ's medium projections, with its assumption of a net international migration flow into New Zealand of 15,000 people per annum over the medium term.

We have then translated this projected population growth into demand for new dwellings based on the historic gap between growth in the population and the total dwelling stock,[12] as well as allowing for some scrappage of existing dwellings or non-construction of new consented dwellings. For Queenstown-Lakes, this assumption results in significantly lower rates of residential construction over the medium term (see Graph 60) due to the sharp drop-off in population growth to below 2.0%pa from 2024 onwards. The effects of this weak population growth are exacerbated by the fact that growth in the District's dwelling stock historically has generally been weaker than population growth. This gap reflects Queenstown's evolution from a holiday area with a high proportion of dwellings that were not permanently occupied to a town with a larger resident population.

Graph 60

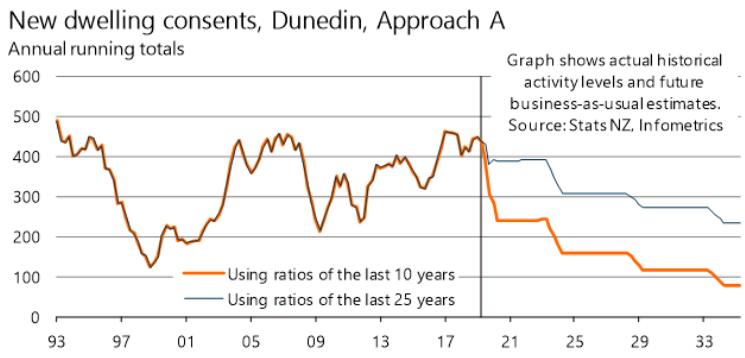


For Dunedin, weaker population growth is the clear driver of lower residential consent numbers over the medium term, although the range of activity is relatively wide depending on whether we look at the average scrappage rate and the gap between

[12] Where we have based our projections on historic gaps or ratios, we have generally looked at the figures over two different time periods: the full period of available data (often back to the early 1990s), and the last 10 years. The inclusion of both time periods means that we are using the long-term average, but can also pick up instances where more recent data suggests that the relationship might have changed compared to what might have prevailed in the 1990s, for example.

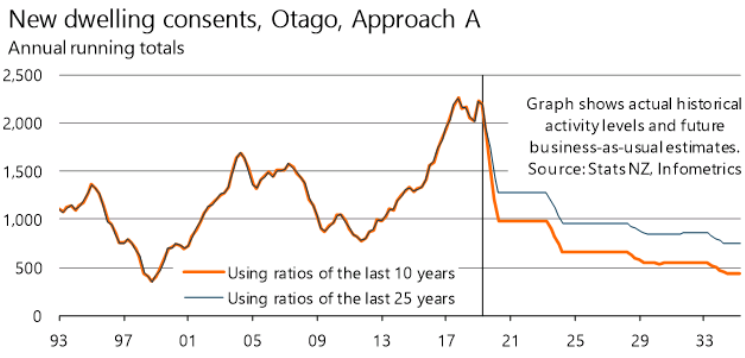
growth rates in the City's population and dwelling stock since 1992/93 or only over the last ten years (see Graph 61).

Graph 61



Overall results for Otago under Approach A, estimated by following this process for each of the five territorial local authority areas in the Region, are shown in Graph 62.

Graph 62



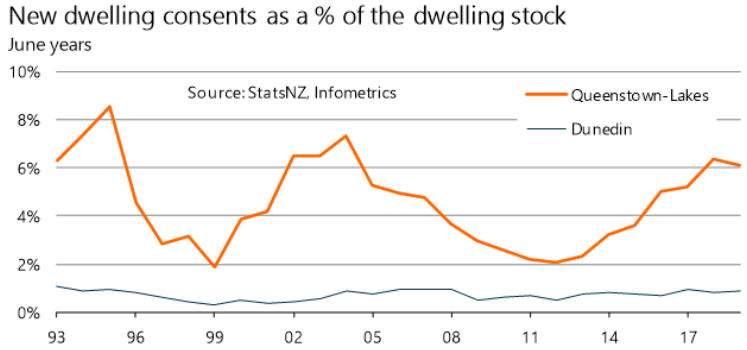
B: The dwelling stock

A key shortcoming of the methodology in the previous section is that it assumes the residential build rate is simply a function of population growth. Although population growth tends to be the biggest and most variable driver of demand for new residential building, there are other factors that contribute to underlying demand as well. These factors include changes in:

- the occupancy rate – the number of people per household
- the vacancy rate – the proportion of unoccupied dwellings
- the scrappage rate – the proportion of existing dwellings that are demolished.

These factors, along with the effect of population growth, can be implicitly captured by looking at the residential build rate compared to the size of the existing dwelling stock. This ratio for Dunedin and Queenstown-Lakes is shown in Graph 63.

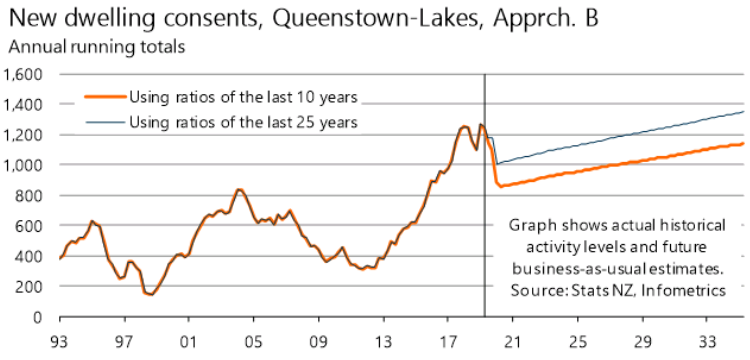
Graph 63



We have taken the historical average of this ratio and applied it to current and future estimates of the dwelling stock in each area. These estimates of the dwelling stock have been generated by combining Statistics NZ's projections of growth in household numbers with our own estimates of the current occupied and total dwelling stock. We have assumed that the vacancy rate remains unchanged throughout the forecast period, while the occupancy rate is able to change in line with shifts in the demographic make-up and age profile of the population.

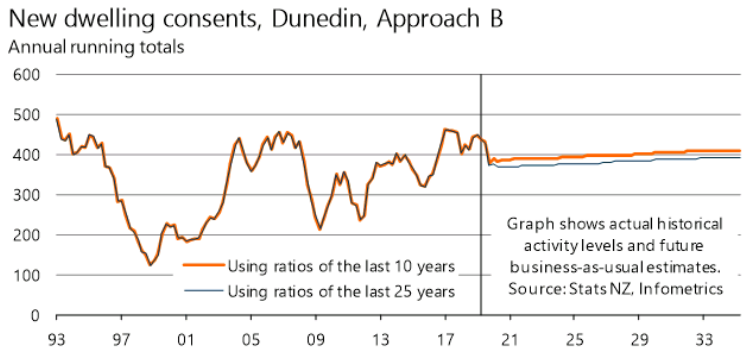
In contrast to the methodology of Approach A, Approach B does not adequately allow for future population growth to be different to historical population growth. For example, over the 15 years between 2020 and 2035, Graph 64 shows that Approach B implies dwelling consent numbers totalling between 15,200 and 18,000 in Queenstown-Lakes, well above what would be required to cater to growth in household numbers implied by Stats NZ's projections of slowing population growth.

Graph 64



Graph 65 shows that this issue is less problematic for areas such as Dunedin, where less of a change in population growth is anticipated over the next 15 years.

Graph 65

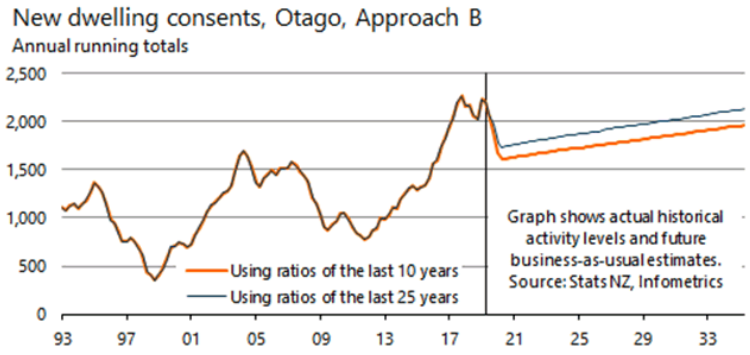


Any errors caused by the simplifying assumptions under Approach A tend to cancel out the errors caused by the simplifying assumptions under Approach B. We are thus comfortable that, taken together, the two sets of numbers give a reasonable outlook for new dwelling consent figures over the medium term.

In the case of Queenstown-Lakes, we also note that some of Stats NZ's population projections over the last 20 years have been overly conservative. Thus we believe it is prudent to include a scenario within our range where the implied growth rates of the population and household numbers are significantly higher than allowed for by Stats NZ's projections.

Overall results for Otago under Approach B, estimated by following this process for each of the five territorial local authority areas in the Region, are shown in Graph 66.

Graph 66



C: Household formation

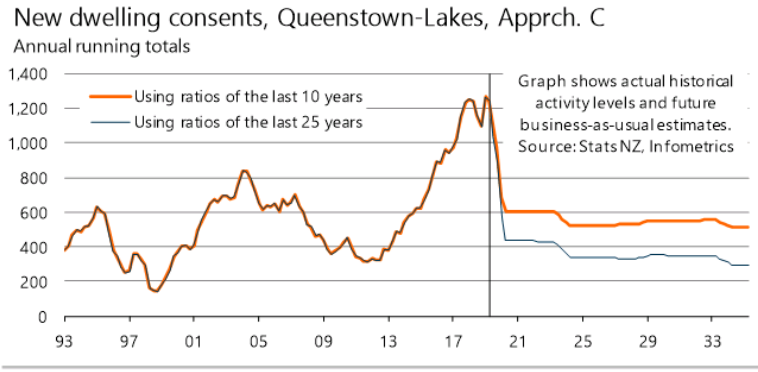
Population growth provides some indication of underlying growth in housing demand, but demographic changes and cyclical influences can also affect the need for new dwellings to be built. For example, New Zealand's aging population implies that the occupancy rate is likely to continue declining in coming years, as the share of households represented by older couples increases relative to the share of younger couples with children. Factors such as housing affordability and economic conditions can also influence the occupancy rate, with high housing costs encouraging people to "crowd" together more to try and reduce the average housing costs that they face.

By definition, estimation of a BAU scenario will not capture these cyclical factors that might lead to crowding. These factors would be expected to wax and wane over the course of the economic cycle and even out over the medium term. However, demographic factors such as the aging population will be incorporated within Stats NZ's projections of household numbers.

As we have outlined previously with Stats NZ's population projections, we have amended Stats NZ's medium household projections to reflect higher or lower starting points based on our own modelling and estimates of household numbers. Looking forward, we effectively assume that the growth rates in household numbers projected by Stats NZ in future years remain appropriate.

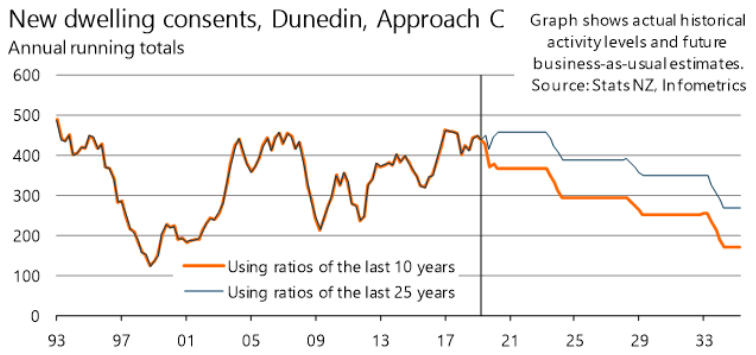
In Approach C, we assume an increase in the number of unoccupied dwellings as the dwelling stock expands, to keep the vacancy rate constant, as well as allowing for a scrappage rate in line with historical averages. The results for Queenstown-Lakes are shown in Graph 67, with household numbers in the District increasing by about 6,000 between 2020 and 2035 as population growth slows. This growth corresponds to an increase of about 7,250 in the total dwelling stock once unoccupied dwellings are considered and is significantly smaller than the BAU numbers calculated Approach B.

Graph 67



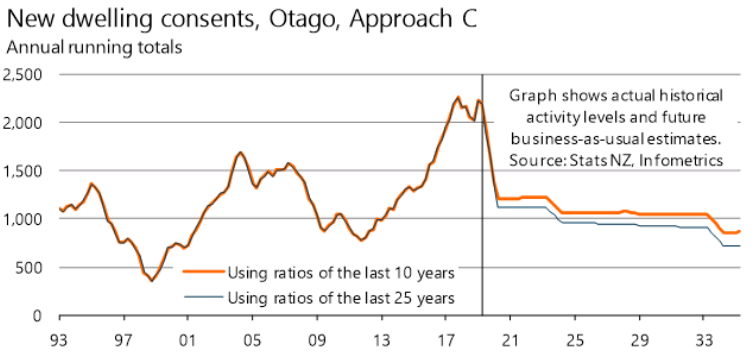
Projections for residential consent numbers in Dunedin are similar under Approaches B and C between now and 2028. It is only beyond 2028 that slower projected growth in household formation rates start to have a more significant effect on new dwelling requirements in Dunedin (see Graph 68).

Graph 68



Overall results for Otago under Approach C, estimated by following this process for each of the five territorial local authority areas in the Region, are shown in **Error! Not a valid bookmark self-reference.**.

Graph 69

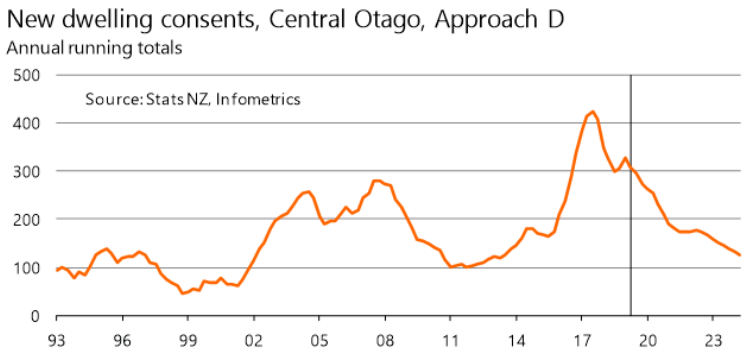


D: Infometrics' existing forecasts

Infometrics currently publishes quarterly forecasts of construction activity, including new dwelling consent numbers, out to mid-2024. Strictly speaking, these forecasts cannot be viewed as providing a BAU projection, given that they take economic and other cyclical conditions into account, particularly in the near term. However, the nature of the forecasts also implies that they contain information that is potentially useful in augmenting the BAU calculations previously undertaken.

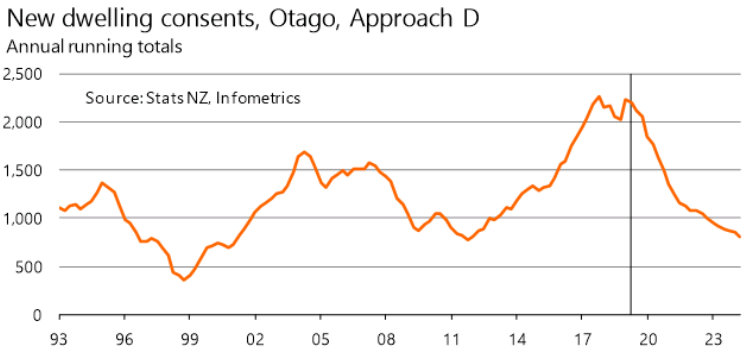
For example, if we take the average of the dwelling consent numbers under Approaches A, B, and C, Central Otago's implied BAU new dwelling numbers in the year to June 2020 would be just 156, down about 50% from the 310 consents in the June 2019 year. Although a forecast drop in consents might be appropriate given softer economic growth, a weaker housing market, and slowing population growth, it is questionable whether such a large decline in activity is realistic. Infometrics' forecasts predict a more moderate drop in consent numbers of 18% over the June 2020 year (see Graph 70).

Graph 70



Infometrics' overall forecasts for Otago, summing up the five territorial local authority areas in the Region, are shown in **Error! Not a valid bookmark self-reference.**.

Graph 71

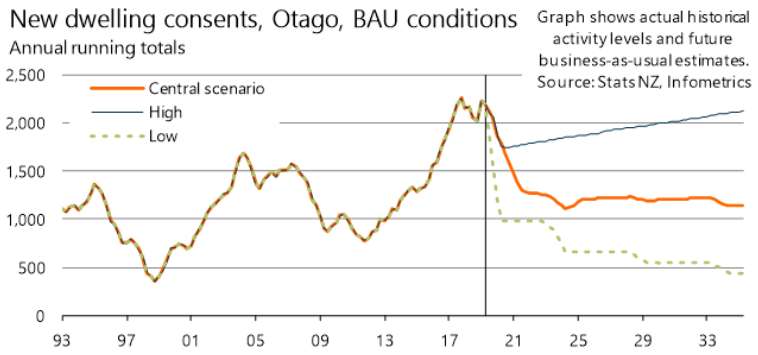


Final results

We have taken the average consent numbers under each of the four Approaches outlined above to estimate a central BAU scenario for dwelling consent numbers in Otago and Southland over the next 15 years. Additionally, within the two years to June 2021, where Infometrics' quarterly forecasts are more than 10% higher than this average BAU figure, we have chosen to adopt the higher forecast figure. This decision ensures that our final BAU scenario adequately accounts for cyclical factors that could underpin "higher-than-normal" demand for new housing in the near term.

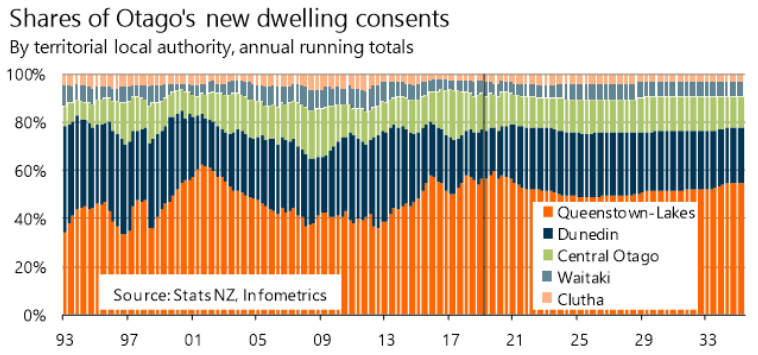
The results are shown in Graph 72. From 2023 onwards, new residential consent numbers in Otago can be expected to settle at between 1,100 and 1,240pa under business-as-usual conditions. This level is substantially lower than the recent peaks of more than 2,200 new dwellings per annum. This outlook does not imply that consent numbers will not be higher (or lower) than "normal" at times over the next 15 years, but clearly indicates that recent consent numbers are unsustainably high.

Graph 72



The projected geographic mix of dwelling consents in Otago over the medium term is expected to slightly favour Queenstown-Lakes more than has been the case in the past. Having averaged a share of new dwelling consents in Otago of 47-50% over the last two decades, Queenstown-Lakes is expected to account for 49-55% of consents between 2023 and 2035 (see **Error! Not a valid bookmark self-reference.**). The share of Otago's consents in Dunedin and, to a lesser extent, Central Otago, are expected to be a little below the averages of the last two decades.

Graph 73



New residential work put in place

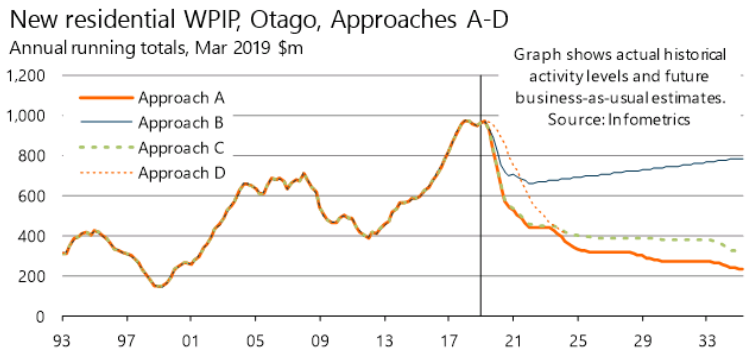
Although dwelling consent numbers are easy to interpret, we are ultimately interested in estimating the volume of building activity that is likely to take place under BAU conditions. Taking the consent numbers generated using each of the Approaches previously outlined, we have converted these consents into building work put in place using our standard modelled relationships between consents and completed building work.

For Approaches A, B, and C, we have made assumptions about the split of new dwellings between standalone houses, apartments, retirement units, and townhouses, flats, and other units. These assumptions are based on historic ratios for each local authority area.

The assumptions have little effect on the final volume of work that is undertaken, but they do have some effect on how quickly projects progress from consent to completion on average. For example, the construction of standalone houses is typically completed more quickly than construction of larger multi-unit developments.

Graph 74 shows the residential work put in place projections for Otago under Approaches A, B, and C, as well as the figures published in Infometrics' forecasts that are consistent with the consent numbers included in Approach D.

Graph 74



We have augmented these sets of BAU figures with one additional Approach for estimating new residential work put in place under "normal" conditions, as detailed below.

E: New residential building and total economic activity

The size of the construction sector within an area's overall economy can potentially provide a useful benchmark for future activity levels. The variation between slower-growing areas and places with rapid population growth is very apparent in the numbers (see Graph 75). Over the last decade, new residential building work put in place has been equivalent to almost 18% of GDP on average in Queenstown-Lakes. The comparable ratios for Dunedin, Waitaki, and Clutha are all between 1.8% and 2.4% of GDP.

As a region or country's economy becomes more mature and there is less need for expansion of its building stock, construction is likely to become a smaller part of overall economic activity. Over a forecast horizon of 15 years, we would not expect there to be any major change in the ratio of construction activity to GDP. Nevertheless, we note that this Approach generates higher work put in place estimates than the other Approaches, particularly for Queenstown-Lakes.

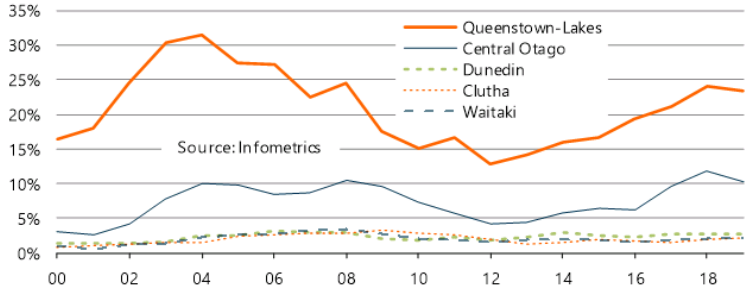
Infometrics has existing forecasts of GDP by local authority area out to 2024. From 2024 onwards, we have assumed that GDP per capita grows in line with its historic average. The results for new residential work put in place under Approach E for Queenstown-Lakes and Dunedin are shown in Graph 76.

Overall results for Otago under Approach E, estimated by following this process for each of the five territorial local authority areas in the Region, are shown in Graph 77.

Graph 75

Value of new residential WPIP as a % of GDP

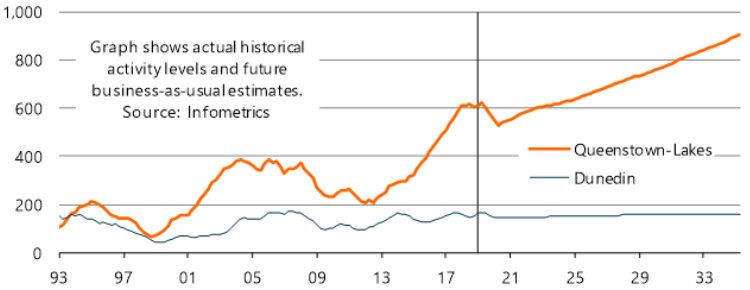
March years



Graph 76

New residential work put in place, Approach E

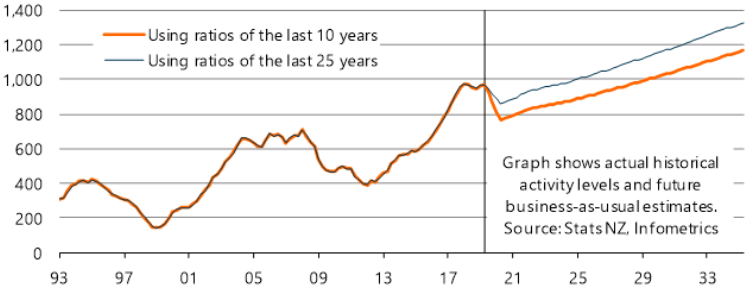
Annual running totals, Mar 2019 $m



Graph 77

New residential work put in place, Otago, Approach E

Annual running totals, Mar 2019 $m

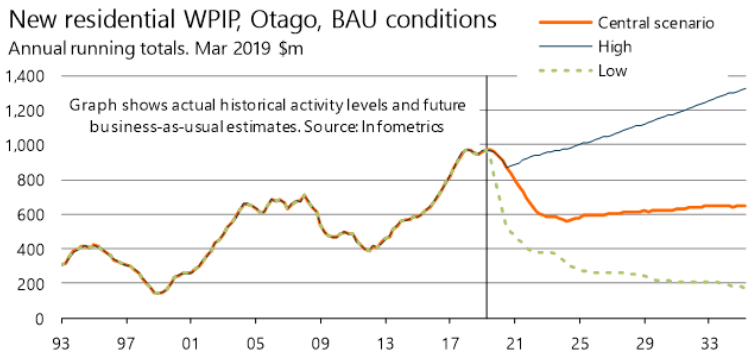


Final results

Taking the BAU estimates for new residential work put in place for Approaches A-E for each territorial local authority provides us with the range of aggregate figures for Otago

shown in Graph 78. The inclusion of Approach E adds a slight upward trend to our central BAU estimates for new residential construction activity in Otago from 2024 onwards. However, the key feature to note about our central BAU estimates is that, even at their high point in 2033, activity levels are still expected to be about 33% lower than the peak recorded in 2018. The figures reiterate that residential construction activity in Otago is currently at unusually and unsustainably high levels, and it would take an extreme set of assumptions to not expect substantial spare capacity in the region's residential construction workforce to become available within the projection period.

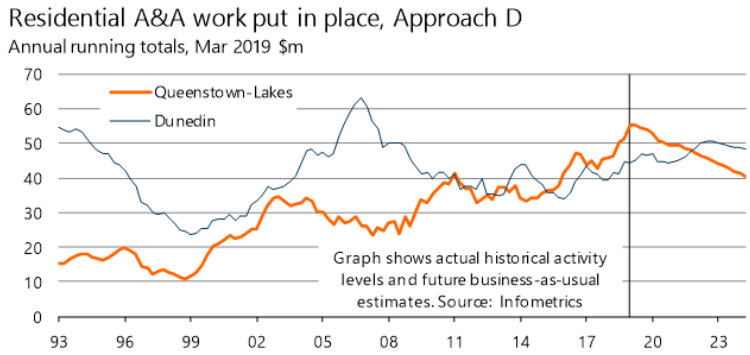
Graph 78



Residential alterations and additions work

Residential alterations and additions (A&A) work represents about 14% of total residential building work in Otago over the last decade. A&A work put in place data only captures activity that requires a building consent. Other maintenance, repair, and renovation work possibly represents a similar volume of work to activity that has gone through the consent process.

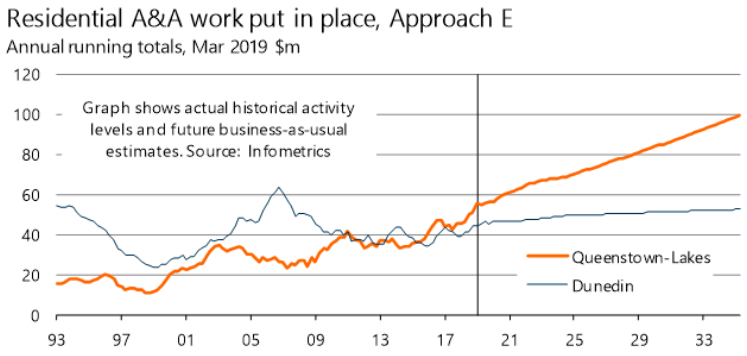
Graph 79



We have utilised Approach D (Infometrics forecasts) and Approach E (A&A work put in place compared to overall economic activity) to estimate BAU activity levels for

residential A&A activity in Otago. The results for Queenstown-Lakes and Dunedin are shown in Graph 79 and Graph 80.

Graph 80

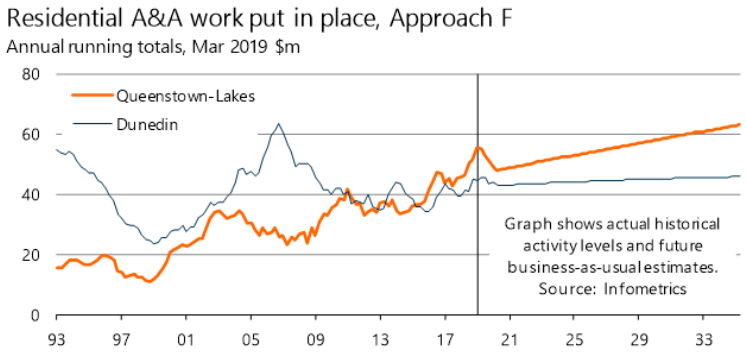


F: Residential alterations and additions and the dwelling stock

The size of the dwelling stock can be expected to have an influence on the volume of residential A&A work that takes place. As the dwelling stock in an area expands, one would also expect more A&A activity to occur.

In general, future growth in the dwelling stock across Otago is expected to be slower than economic growth. As a result, projections of A&A activity using Approach F are lower than those using Approach E (see Graph 81).

Graph 81

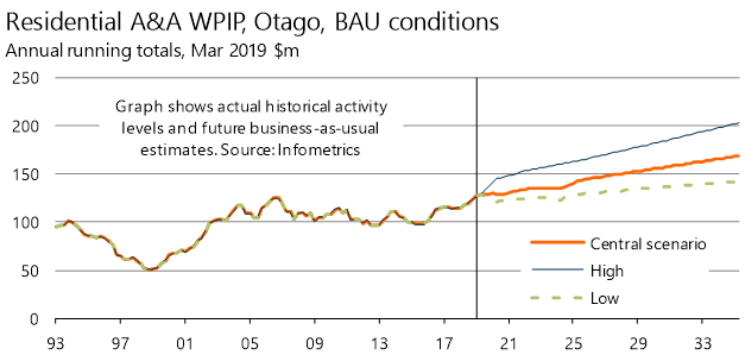


Final results

In summary, there are fewer benchmarks for estimating residential A&A work. However, A&A activity is typically less variable than new residential building work, and it also makes up a much smaller share of total construction activity.

The range of BAU estimates for A&A work in Otago is shown in Graph 82. The key point to note from this graph is that, under all scenarios, A&A activity in Otago is expected to trend upwards over the medium term. Our central scenario sees an average growth rate of 1.7%pa between 2019 and 2035, with average growth ranging from 0.7%pa at the lower end of the range to 2.9%pa at the top end.

Graph 82

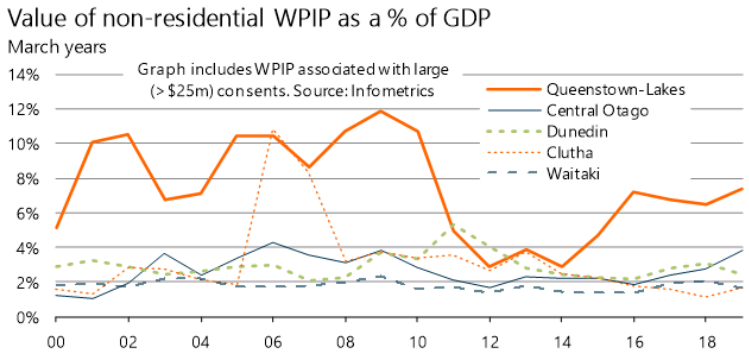


Non-residential work put in place

The range of possible approaches to project non-residential construction activity is more limited than for residential building. The best benchmark against which to compare non-residential construction is economic activity. Construction will ebb and flow throughout the economic cycle, but the underlying drivers of demand for additional commercial or industrial space are factors such as employment or industrial production, which will generally move in line with GDP over the medium term.

We have adapted Approach E, as outlined above for residential work put in place. We have estimated both non-residential building consents and non-residential work put in place based on their historical ratios with GDP mapped against expected economic growth in the Otago territorial local authorities over the next 15 years (see Graph 83).

Graph 83



As part of this process, we have removed several high-value consents (over $25m) from the data to try to ensure that the BAU ratios are not skewed by large one-off projects.[13] This correction process is not perfect because large projects are often consented in multiple stages and, therefore, only some or none of the project is captured in the over-$25m category. The construction of the Otago Corrections Facility near Milton between 2005 and 2007 is an example of a large project (approximately $176m) with no consents over $25m, while the $206m construction of Forsyth Barr Stadium in Dunedin between 2009 and 2011 only included two large consents totalling $91m.

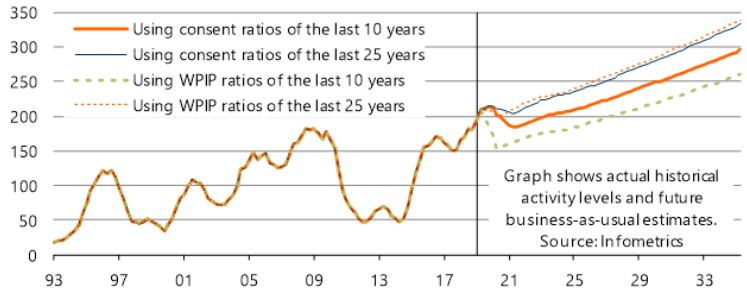
To further safeguard against large projects skewing the numbers, we have used the median historical ratios of annual consents and work put in place to GDP, rather than the average historical ratios that we utilised for residential activity. This choice generally leads to slightly lower BAU ratios for non-residential work than using the average historical ratios.

In the case of consents, we have then converted consents into work put in place based on our standard models that allow for lags between the two measures of building activity. For each local authority area, we have used different weightings for each of the nine non-residential building types, based on their historical shares of building. For example, farm building has historically made up 27-33% of non-residential building consents in Clutha but only 2.2-2.3% of non-residential consents in Queenstown-Lakes. Queenstown-Lakes' rapidly expanding economy has meant that other building types such as accommodation (23-35% of consents) and retail building (21-25% of consents) have played a much more significant role in activity.

Graph 84

Non-residential WPIP, Queenstown-Lakes, Approach E

Annual running totals, Mar 2019 $m



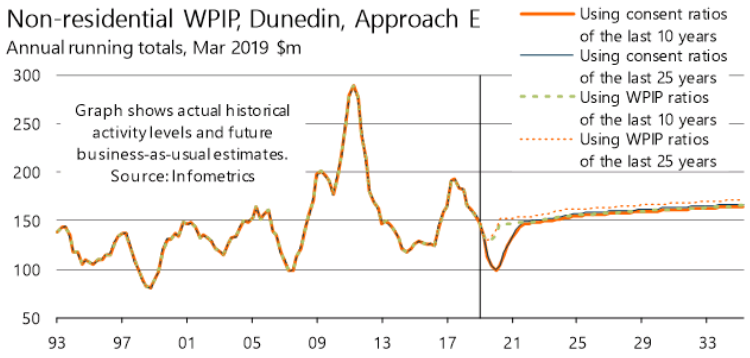
The range of results using Approach E for Queenstown-Lakes is shown in Graph 84. Each projection has a steady upward trend at about 3.4%pa over the medium-term as the District's economy is expected to grow. The main points of difference relate to the base

[13] Details of these large consents were sourced from Stats NZ and included a $26m education building in Dunedin in 1998, consents totalling $90.8m associated with Forsyth Barr Stadium in Dunedin in 2009 and 2010, a $35m consent for work at Dunedin Town Hall in 2010, a $35m education building in Dunedin in 2015, two education building consents totalling $107.5m in Dunedin in 2016, and a $25m consent for Wakatipu High School in Queenstown in 2016. Consents for a $37m factory building in Invercargill in 1996 and a $25.8m consent at Fonterra's Edendale dairy factory in 2008 were also removed from the Southland numbers.

level of activity, which is higher using the 25-year averages than the averages of the last 10 years, and how quickly activity settles back from current levels to BAU levels.

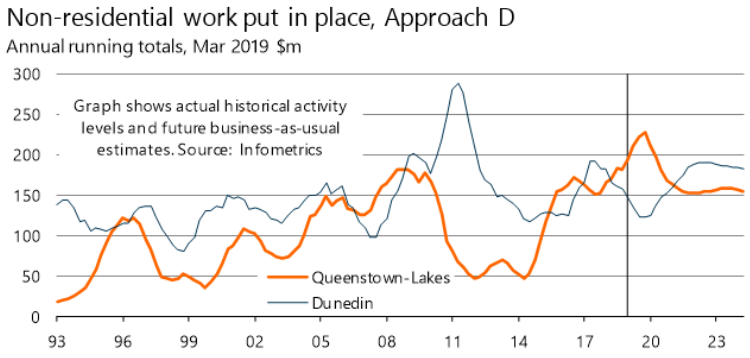
Graph 85 shows that, unlike Queenstown-Lakes, there is minimal variation in BAU levels of non-residential construction activity in Dunedin over the medium-term. In the near-term, estimates using the ratio of non-residential consents to GDP are considerably lower. This fall is due to a substantial decline in consent values, from $220m in the June 2017 year to just $65m in the June 2019 year, indicating a lack of new activity currently in the pipeline. Assuming more "normal" consent levels in coming quarters results in a rebound in the estimates of work put in place by 2022, with limited growth of 0.8%pa in the volume of activity over the longer-term.

Graph 85



As is the case with our residential projections, we have also utilised Infometrics' forecasts of non-residential work put in place out to mid-2024. These forecasts offer additional information about cyclical drivers in the near-term that might push construction activity away from the levels that would otherwise be expected as BAU. We have stripped out four specific large projects that were included in these forecasts to ensure that they fairly represent underlying demand conditions for non-residential construction in Otago and Southland. The forecasts for Queenstown-Lakes and Dunedin are shown in Graph 86.

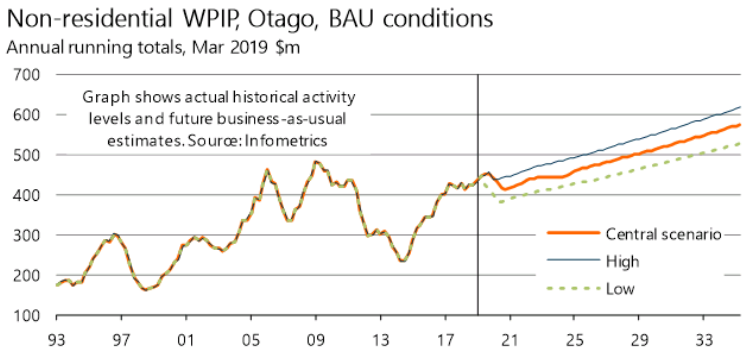
Graph 86



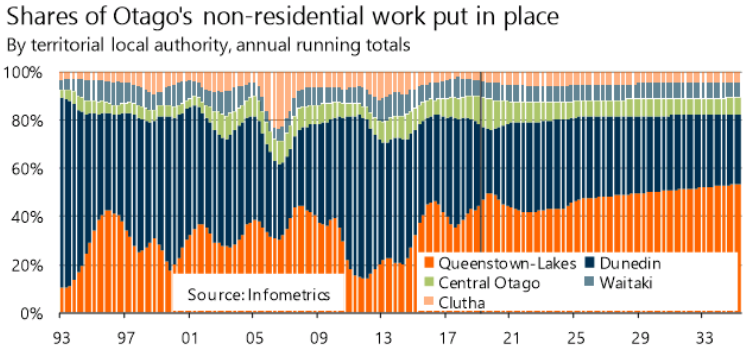
Final results

Taking the average work put in place figures generated by Approaches D and E for non-residential building across each of the territorial local authorities in Otago provides us with the BAU estimates shown in Graph 87. Non-residential construction activity in the region is currently at a historically high level and, under the central scenario, can be expected to ease during 2020 and early 2021. Nevertheless, this decline of about 8% from its peak level in 2019 is modest compared to the estimated 15% fall in residential work put in place over the same period. Put another way, non-residential activity under BAU conditions could be expected to hold below current levels through until 2024, but any drop is likely to pale in comparison beside the expected 37% decline in residential work over this five-year period.

Graph 87



Graph 88



Over the longer-term, non-residential construction activity is expected to trend upwards under BAU conditions, growing at an average of 2.2%pa between 2025 and 2035. This increase will primarily be underpinned by activity in Queenstown-Lakes, reflecting ongoing faster expansion in the District's economy and population than in other parts of Otago. Queenstown-Lakes' share of total non-residential activity in Otago is expected to lift from 47% to 53% over the decade to 2035. Graph 88 shows that Queenstown-Lakes'

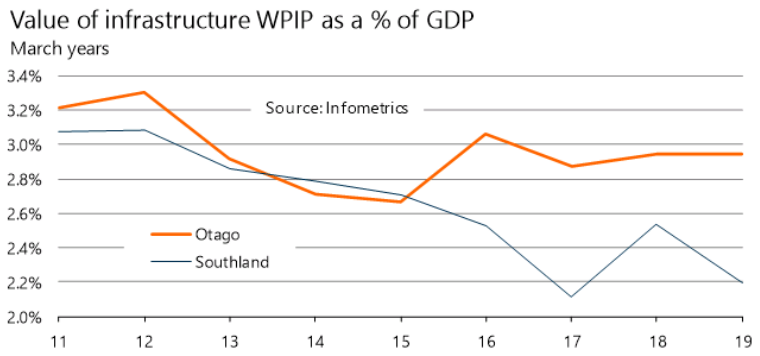
is expected to sustain a much larger share of Otago's non-residential work than has been the case in the past.

Infrastructure

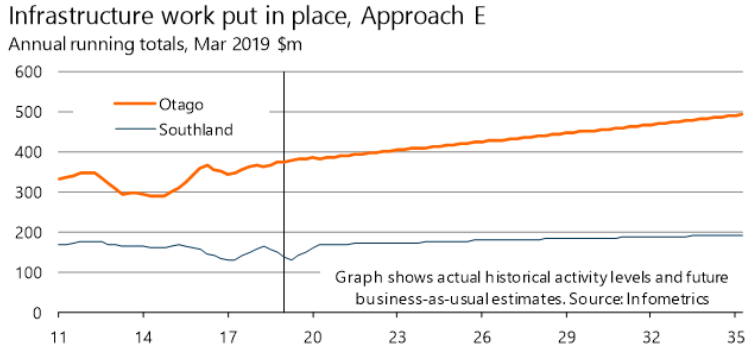
Information on infrastructure activity in New Zealand below a nationwide level is very limited. However, over the last decade, Infometrics has compiled data from central government agencies, local government, and private sector companies to gain insights into infrastructure spending at a regional level. This work has enabled us to estimate a regional split of "other construction" spending published by Stats NZ in the national accounts.

As is the case with non-residential building, the range of benchmarks against which infrastructure spending can be measured is relatively limited. Graph 89 shows our estimates of infrastructure spending for Otago and Southland over the last decade relative to regional GDP. It is reasonable to expect that, as an economy expands, the amount of infrastructure needed to service the economy will increase, requiring expenditure on expanding or upgrading infrastructure networks. Spending on maintenance will also increase as the stock of infrastructure expands over time.

Graph 89



Graph 90



We have repeated Approach E, outlined above for residential A&A and non-residential building, to estimate a future scenario for infrastructure spending in Otago and Southland given our assumptions about the regions' economic growth. Graph 90 shows that, under this Approach, infrastructure activity in Otago could be expected to increase by an average of 1.7%pa over the next 15 years, with slower growth of 0.8% predicted for Southland.

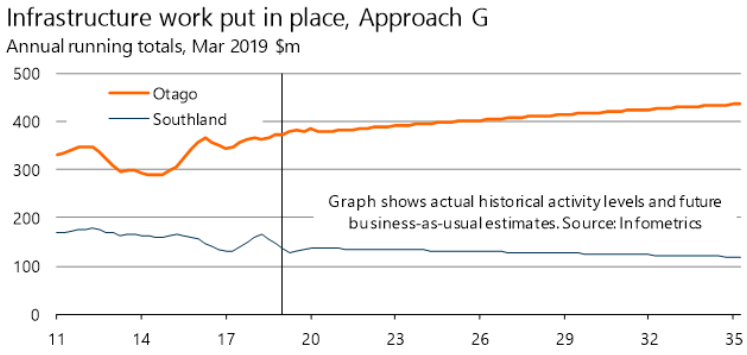
G: Infrastructure and population growth

Another possible determinant of infrastructure spending is population growth. The infrastructure needs associated with an expanding population have been clearly experienced in New Zealand over recent years. The housing and transport needs of an increasing number of people ultimately require more investment in water and wastewater networks, roading, and other network infrastructure.

We have looked at average growth in infrastructure expenditure in Otago and Southland since 2011 and compared it to average population growth in the two regions. We recognise that this time period is relatively short in the context of infrastructure spending, with planning and construction timelines often lasting many years. Spending decisions are unlikely to be made immediately in response to changes in population growth, and the assets being constructed are generally intended to last for decades. Nevertheless, the average growth rates in infrastructure spending and population growth are reasonably similar over time, even if they don't tend to move together in any individual year.

With population growth expected to slow over the medium-term, this Approach suggests smaller increases in infrastructure spending in Otago over the medium term and hints at possible declines in infrastructure spending in Southland (see Graph 91).

Graph 91

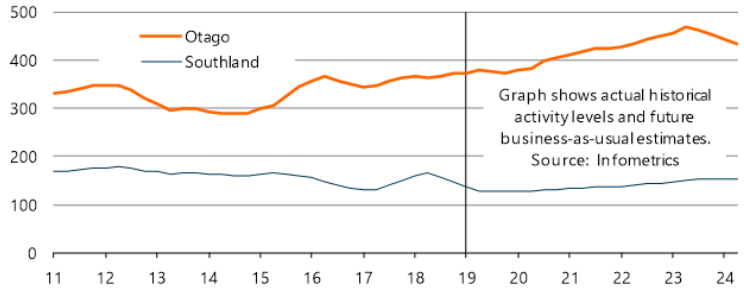


As with residential and non-residential construction, we have also utilised Infometrics' forecasts of infrastructure activity out to mid-2024 (Approach D). These forecasts consider cyclical conditions and planned spending baselines where information is available. They are also able to allow for any "catch up" in infrastructure spending that might be required following the unexpectedly strong population growth across much of the country in recent years. The forecasts for Otago and Southland are shown in Graph 92.

Graph 92

Infrastructure work put in place, Approach D

Annual running totals, Mar 2019 $m



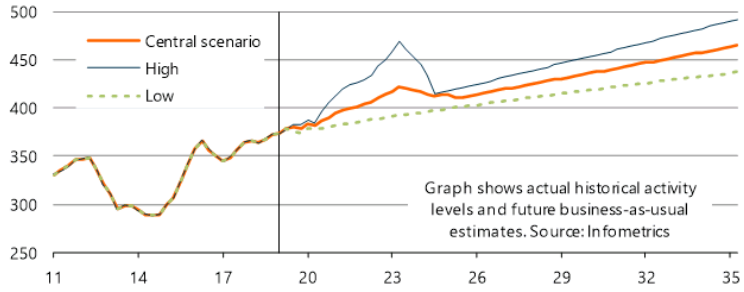
Final results

Taking the average results across Approaches D, E, and G for infrastructure spending provides us with the BAU estimates for Otago shown in Graph 93. In the near-term, there is significant variation across the different approaches, with our independent forecasts suggesting there needs to be some catch-up in infrastructure spending to make up for underinvestment in previous years. This outlook drags up our estimate of BAU activity, with average growth of 3.5%pa expected between June 2020 and June 2023.

Graph 93

Infrastructure WPIP, Otago, BAU conditions

Annual running totals, Mar 2019 $m



After a lull in growth between 2023 and 2025, an upward trend in BAU infrastructure activity can be expected in Otago over the medium term.

Appendix: Government migration policy

Changes to immigration policy announced by the government in September 2019 will see employers in Dunedin that are looking to hire foreign workers subject to different rules from employers in other parts of Otago and Southland. This section provides more details of the government's new work visa rules. It also records the construction-related occupations currently included in Immigration NZ's skill shortage lists as an indication of what might be included in future lists as the government reconfigures its approach to temporary work visas.

The new rules for employers offering jobs to migrant workers vary depending on whether the pay rate is at or above the nationwide median wage (currently $25 per hour) or below the median wage. The rules also vary by type of labour market region, with the country split into three categories: cities, higher supply regions, and lower supply regions.

Cities

Dunedin is classified as a city. Employers offering a job in a city that pays at or above the median wage must:

- check that the job that is on a skill-shortage list, or
- show they meet a labour market test by providing evidence that the job has been advertised and the advertising included the rate of pay, or
- show that the pay for the job is 200% or more of the median wage.

The migrant worker they employ can get a visa for up to three years.

Employers offering a job in a city that pays below the New Zealand median wage must show they meet the new strengthened labour market test.

The migrant worker they employ can get a visa for up to 12 months. The worker can renew their visa but can only work in New Zealand for up to three years. At the end of that time, they must leave New Zealand. If they want to return, they must spend at least 12 months outside New Zealand first before they apply for another work visa.

Lower supply regions

The rest of Otago (and Southland) is classified as a lower supply region. Employers offering a job that pays at or above the median wage do not have to show they meet a labour market test. The migrant worker they employ can get a visa for up to three years and then renew their visa.

Employers offering a job in a lower supply region that pays below the New Zealand median wage must show they meet the new strengthened labour market test.

The migrant worker they employ can get a visa for up to three years. At the end of that time they must leave New Zealand. If they want to return, they must spend at least 12 months out of New Zealand first before they apply for another work visa.

Skill shortage lists

At the time of writing, the following construction-related roles appeared on Immigration NZ's Long Term Skill Shortage List. These are occupations where there is a sustained and ongoing shortage of highly skilled workers both globally and throughout New Zealand.

- Construction project manager
- Project builder (including building project manager and site foreman)
- Quantity surveyor
- Surveyor
- Electrician
- Electric line mechanic

There is also a wide range of occupations in Immigration NZ's Construction and Infrastructure Skill Shortage List. These are occupations in critical shortage in the construction industry across New Zealand. Some of the occupational shortages are listed only for specific regions, while others are nationwide. The following occupations apply to Otago.

- Construction project manager (foreman) (roading and infrastructure)
- Building inspector / building surveyor
- Surveying technician (spatial science technician / land surveyor's technician)
- Surveying or spatial science technician (building information modelling professional)
- Civil engineering draughtsperson
- Electrical engineering draughtsperson
- Carpenter and joiner
- Carpenter
- Joiner
- Fibrous plasterer
- Solid plasterer
- Roof tiler
- Plumber (general)
- Roof plumber

- Cabler (data and telecommunications)
- Telecommunications cable jointer
- Telecommunications technician
- Scaffolder

These lists will be revised or reconfigured with the government's changes to temporary work visas. The government will continue to have regional skill shortage lists for the cities, including Dunedin, and is set to form Regional Skills Leadership Groups to provide advice on the skills needed in different regions. The Regional Skills Leadership Groups are expected to be established by mid-2020 and will take a broad view of demand for labour and skills and how that can be met by the immigration, education, and welfare systems.

Before 2021, the government also plans to negotiate sector agreements with industries that employ large numbers of migrant workers. These agreements will be designed to provide employers more certainty about hiring migrant workers and reduce compliance costs compared with the normal recruitment process. The agreements are intended to concentrate on industries where workers are generally paid below the median wage.

Although construction has not been identified as one of the six sectors that the government will negotiate with initially, it is listed as a "likely candidate" for a sector agreement by Immigration NZ.