

Te Waihanga
January 2021

Glossary

Acronym	Full name
Bn	Billion
BRANZ	Building Research Association of New Zealand
COVID-19	2019 novel coronavirus
CCNZ	Civil Contractors New Zealand
GDP (E)	Gross Domestic Product (expenditure method)
GDP (P)	Gross Domestic Product (production method)
GFC	Global Financial Crisis
MBIE	Ministry of Business, Innovation and Employment
Mn	Million
NZUP	New Zealand Upgrade Programme
NZQA	New Zealand Qualifications Authority
Our Survey	C-19 Recovery Survey
RBNZ	Reserve Bank of New Zealand
RICs	Royal Institution of Chartered Surveyors
RMA	Resource Management Act
Stats NZ	Statistics New Zealand
The Sector	The infrastructure-related construction sector

Acknowledgements

The New Zealand Infrastructure Commission (Te Waihanga) and Deloitte gratefully acknowledge the assistance of both public and private sector stakeholders who contributed their insights to this report, through interviews and Te Waihanga's targeted COVID-19 Recovery Survey.

Te Waihanga conducted a targeted survey of the impacts of COVID-19 on the infrastructure-related construction sector and opportunities to support recovery. The survey data used in this report could not have been collected without the co-operation of multiple organisations which agreed to distribute the survey on our behalf, and those organisations which responded to the survey. These organisations came from a broad range of sectors and service providers across the lifecycle of an infrastructure project including:

- Telecommunications
- Energy
- Water
- Airport
- Transport
- Residential Property
- Social Infrastructure
- Engineering
- Architecture
- Building Materials
- Professional Advisory

We also acknowledge AECOM's assistance in the distribution of the survey and provision of sector specific insight.

Insights received from AECOM, the survey and stakeholder interviews were critical to the analysis and insights presented in this report.

Executive summary

This report is based on a series of interviews with sector peak bodies in the infrastructure-related construction sector, and a targeted survey of individual firms to understand the impact of COVID-19 on the Sector.

The New Zealand Infrastructure Commission (Te Waihanga) commissioned Deloitte to undertake a COVID-19 recovery study of the infrastructure-related construction sector (the Sector).

Infrastructure investment is not just being relied upon to deliver economic stimulus, it is critical to the long-term wellbeing of New Zealanders. A strong infrastructure-related construction sector is essential to delivering New Zealand's infrastructure pipeline. Insights gained from this report will support Te Waihanga as it engages with the Sector and looks to fulfil its mandate to lift infrastructure planning and delivery to a more strategic level.

This report has been informed by a new COVID-19 Recovery Sector Survey (our survey or C-19 Recovery Survey) and interviews with key peak bodies over September to October 2020, augmented with existing research, sector surveys and data published in November and December 2020.

The Sector encompasses horizontal, vertical and residential construction as well as related construction activities. The focus of this report is on horizontal and vertical construction. Horizontal construction is construction of a non-building type such as roads, bridges, utilities and other civil works. Vertical construction comprises of building types other than residential structures, including hotels, offices, retail outlets, industrial buildings and social infrastructure such as prisons, schools and hospitals.

State of the Sector prior to COVID-19

The Sector is a major contributor to economic activity in New Zealand, accounting for 6.9% of GDP and 10% of total full-time equivalent jobs in 2019. Prior to COVID-19, the Sector's growth also outpaced that of the broader economy with vertical construction growing at an annual rate of 4.9% and horizontal construction 4.2%, compared to average annual GDP growth of 3.5% between 2015 and 2019.

However, the Sector was not without its challenges. Access to appropriate skills and low relative productivity have hampered historical output, along with increasing cost of materials and local council funding challenges. The cyclical nature of Government infrastructure investment has also made it difficult for the Sector to plan and invest.

The outlook for the Sector was relatively positive prior to COVID-19. Demand for the Sector is derived from the pipeline for infrastructure, so this report uses this as an indicator for the outlook. In the Ministry of Business, Innovation and Employment's (MBIE) 2019 National Construction Pipeline forecast, horizontal infrastructure was forecast to increase gradually from \$7.6bn in 2018 to a peak of \$8.3bn in 2024. Similarly, the immediate demand for vertical infrastructure was expected to be strong and reach a peak of \$9bn in 2021, before declining to \$7.2bn in 2024.

COVID-19 impacts thus far

The impact of COVID-19 has made 2020 the most turbulent year in recent history for the Sector. The COVID-19 pandemic necessitated significant public health and economic policy responses centred on addressing the human impacts of the health crisis. Yet, measures aimed to slow the spread of the virus resulted in an unprecedented decline in construction activity.

The restrictions associated with Alert Levels Three and Four had an immediate impact on the Sector and exacerbated existing challenges. Construction activity declined by 27% over Q2 2020 as the Sector felt the effect of lockdowns and restrictions. While the Sector had the highest proportion of supported jobs from the wage subsidy, productivity, an already well-known issue in the Sector, dropped to its lowest levels in 10 years.

Liquidations have also been well below historic averages. The Sector may, however, see an uptick in insolvency activity as the wage subsidy and other government support is wound up, albeit with a lag. Based on historic trends, this insolvency catch-up in 2021 could be approximately 13% higher relative to 2019.

Respondents to our survey reported disruptions to their supply chains, citing challenges with importing and distributing materials, availability of skilled resources, and the lack of certainty around the timing of future projects. **Although survey respondents and interviewees expressed many common concerns, the impact of COVID-19 has not been uniform across the Sector.** Our research and analysis indicate that the vertical construction sector has been harder hit than horizontal construction. The table below presents a summary of key metrics.

Indicator	Horizontal sector	Vertical sector
GDP- change from Q2 2020 relative to Q2 2019	-16%	-29%
GDP- change from Q3 2020 relative to Q3 2019	5%	-7%
A decline of more than 10% in turnover in Q3 2020 (% of respondents)	16%	36%
Hours worked - change from Q1 to Q2 2020	-12.6%	-14.6%
Underutilisation (Sep 2020 and Sep 2019)	+0.7 (4.1 to 4.8)	+0.9 (3.5 to 4.4)
Projects delayed or stalled in Q2 2020 (% of respondents)	71%	79%
Price discounting behaviour in Q2 and Q3 2020 (% of respondents)	44%	62%
Decline in business capital investment due to COVID-19 (% of respondents)	44%	50%
Decline in training investment budgets due to COVID-19 (% of respondents)	50%	45%
Decline of more than 5% in Q3 in the value of 12-month forward order book relative to pre COVID-19 levels (% of respondents)	37%	50%
Decline in more than 5% in business activity in Q3 relative to pre COVID-19 levels (% of respondents)	21%	38%

Source: Deloitte based on the C-19 survey and Statistics New Zealand customised data

The impact on revenue was more severe for those in the vertical construction sector. Over a third of our survey respondents operating in vertical construction expected turnover to decline by 10% to 20% in Q3 2020. The peak bodies interviewed noted that firms operating with a heavy reliance on local government, or vertical construction for the retail/tourism/travel sectors, were likely to be hardest hit. Further impacting firms' finances was a perceived increase in price discounting in order to secure work. Reflecting this backdrop, the majority of survey respondents confirmed projects had been delayed or stalled.

The impact of COVID-19 restrictions on the Sector also caused significant delays in many construction projects and flow-on consequences for subcontractor's plans and work flow. Further, local authorities as key spenders on infrastructure experienced additional funding challenges, driving reductions or deferrals in expenditure. Many local authorities were impacted by a fall in revenue as a result of the economic downturn. These additional funding uncertainties and constraints have been cited in interviews as contributing to delays or cancellations in projects and/or maintenance activities.

Firms have responded to reduced work and higher pipeline uncertainty by decreasing hours and more than 40% of businesses surveyed expected to decrease business capital investment and training budgets. During Q2 and Q3 2020 the majority of businesses surveyed indicated they observed price discounting behaviour to secure work (62% in vertical construction and 44% in horizontal construction).

There are however promising signs the Sector is on a road to recovery. The Sector bounced back in Q3 2020, with a quarterly change in GDP relative to the previous year of 5% in horizontal construction and -7% in vertical construction. Businesses operating in the Sector also bounced back after Q2 and Q3 2020 and are now performing well relative to pre-COVID levels. For example, in assessing the movements in the NZX for companies in the Sector, both enterprise values and enterprise multiples show a positive change in November 2020 relative to November 2019. Sector confidence is also improving. The ANZ commercial construction indicator moved from -32 in August 2020 to 12.5 in November 2020, still some way below the February 2020 level of 26, but well above overall business confidence. Leading indicators, such as steel and ready-mix concrete volumes, are also strong. Spare capacity in the steel sector is expected to be back at pre-COVID levels by December 2021 and ready-mix concrete volumes are rebounding strongly; already back at pre-COVID levels in Q3 2020.

The road ahead

A strong sector will be essential to the COVID-19 recovery, ranking amongst the top in its ability to boost economic activity and create jobs. This means that the final impact it has on economic output is greater than the initial injection of spending. A weak sector will struggle to deliver the infrastructure required.

Overall, **employment weakness** is expected in the coming months as the wage subsidy rolls off. The impact on employment will differ across the lifecycle of a construction project. For example, based on stakeholder interviews, we expect architects and engineers to be initially affected, while workers further along in the building process will be better protected by a pre-COVID pipeline of work in the near future.

The impact of the pandemic on the Sector is far from over and will persist into the future, but we expect the Sector to bounce back faster relative to the Global Financial Crisis (GFC). It took the Sector five years to recover from the GFC. We expect the rebound to be faster because the impact on the Sector during the COVID-19 pandemic is being more driven by restrictions, rather than underlying demand and supply structure issues. There are four key factors that will impact the recovery of the Sector.

Recovery factors applied to infrastructure-related construction



The recovery of each sub-sector will be different. We expect the demand outlook over the next five years in **horizontal construction** to exceed the 2019 National Construction Pipeline forecast. Delivery of this pipeline may be constrained by the capacity of the Sector to deliver, particularly in key sub-sectors that are receiving the bulk of stimulus funding, and the ability of the Sector to access required skills and labour.

The demand outlook for **vertical construction** has been impacted more severely by COVID-19. We expect a dramatic drop in activity relative to the 2019 forecast before a recovery back to previously anticipated levels in 2025. Stimulus initiatives will provide some support to vertical construction but are unlikely to make-up the shortfall in demand associated with the cancellation of private sector developments.

The demand outlook suggests capacity in horizontal construction may be constrained, while there is likely to be excess capacity in vertical construction. Survey respondents indicated 52% of horizontal and 33% of vertical firms can increase capacity by 10% to meet demand if there is an increase in volumes of work; only 8% of horizontal firms can increase capacity by 30% and 14% of vertical firms. This indicates that the Sector likely has the ability to sufficiently increase capacity to respond to the increase in demand for horizontal construction. The excess capacity in vertical construction likely presents a risk that capability and capacity could be lost over the coming years, potentially creating a challenge in the future.

Opportunities to address challenges amplified by COVID-19

The pandemic has revealed vulnerabilities in the Sector that existed prior to the pandemic. The findings of this report suggest challenges amplified by COVID-19 need to be considered as part of an action plan to capitalise on the opportunity that the current infrastructure stimulus presents for the recovery of the economy, and the Sector itself.

The table on the following page summarises the key challenges identified through interviews and our survey, how the challenge existed prior to COVID-19, how the challenge was amplified by COVID-19 and Deloitte's views on opportunities to address the challenge.

COVID-19 presents the opportunity to redefine the way we plan, pay for, and build infrastructure over the next three decades.

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Key themes, challenges, and opportunities identified in this report

Themes	What is the challenge?	Challenges prior to COVID	How COVID amplified this challenge?	Opportunities to address this challenge
Pipeline certainty	Pipeline uncertainty is a key driver of low confidence. The pipeline needs to be complete (have the appropriate mix of projects), certain (forecast spend, and timing is accurate) and strategically robust (projects are strategically aligned and represent value for money).	<ul style="list-style-type: none"> • A lack of a 'single source of the truth' • Tendencies for signalled projects/activity to be delayed • The influence of the electoral cycle on the direction of infrastructure activity, particularly for flagship projects 	<ul style="list-style-type: none"> • One of the greatest concerns many survey respondents shared was the disruption of forward work and the associated uncertainty in the longer-term pipeline • Projects delayed as a result of COVID-19 	<ul style="list-style-type: none"> • Improving the robustness of project selection • Ensuring the pipeline addresses the project lifecycle and all sub-sectors • Achieving appropriate project mix • Collaboration across purchasing and delivery agencies • Identifying and progressing projects that support the widest range of firms
Local government funding	Local authorities are key spenders on infrastructure; however, funding challenges are driving reductions or deferrals in expenditure.	<ul style="list-style-type: none"> • Existing funding challenges related to; maintaining services in areas with declining populations, a requirement for higher asset performance, and replacing assets that are at the end of their useful life 	COVID-19 has impacted some local government's revenue streams and are contributing to delays and cancellations in projects and/or maintenance activities	<ul style="list-style-type: none"> • Available funds either need to be used more judiciously to ensure maximum benefit, or alternative sources of funding needs to be sought • Improve asset management capability • Recognise the important role of maintenance activities
Improve procurement	Procurement processes are adding cost and delay, contributing to a new 'race to the bottom' on pricing in response to COVID-19 uncertainty.	<ul style="list-style-type: none"> • Purchasing entities do not always appropriately consider whole-of-life costs • Inefficient procurement processes • Procurement processes do not always allocate risks to the party best positioned to manage them 	COVID-19 made procurement challenges more pressing: <ul style="list-style-type: none"> • Survey respondents indicated that they have seen price discounting as a result of COVID-19 • Margins for sub-contractors were harder hit than head contractors 	<ul style="list-style-type: none"> • Consistent and expedited procurement processes to help reduce costs and get work to market faster • Increased use of collaborative models • Providing clear and robust plans to procure the work • Consider the ongoing impact of COVID-19 when allocating risks
Workforce and skills	Border closures are constraining access to talent that was already in demand. There is a shortage of work-ready employees and limited ways to transition working adults to the Sector in order to retain jobs.	<ul style="list-style-type: none"> • The range of skills needed are not home-grown, nor in abundant supply • The country's immigration and visa processing systems can be time-consuming and opaque when seeking to obtain border exemptions • Developing people with the right knowledge and skills takes time 	<ul style="list-style-type: none"> • With the overseas workforce drying up, local firms are finding it increasingly difficult to source the right people • There is a ready supply of potential labour within the market as a result of redundancies in other sectors, however, a mechanism is required to support the transition of these workers • Demand for skills is not limited to New Zealand. Other countries are competing for the same talent 	<ul style="list-style-type: none"> • Streamlining and clarifying border exemptions • Targeted micro-courses aimed at transitioning workers into infrastructure-related construction

Source: Deloitte

About this report

In a year marked by turbulence, it is time to reflect on the impact of COVID-19 on a sector integral to drive infrastructure as a stimulus – and to lifting our long-term wellbeing.

The COVID-19 pandemic has had a profound effect on the New Zealand economy. We have entered a period of uncertainty and variable activity. Border closures, along with ongoing restrictions globally, continue to impact all sectors to varying degrees. The infrastructure-related construction sector (the Sector) has not been immune to this, with COVID-19 creating new challenges and exacerbating or accelerating existing challenges.

Given the far reaching and meaningful impacts of the pandemic and Alert Levels Four and Three on the economy, the New Zealand Infrastructure Commission (Te Waihanga) engaged Deloitte to assess both the impact of COVID-19 on the Sector and the outlook for recovery.

This report addresses four questions in relation to the Sector:

- What was the state of the Sector pre-COVID-19?
- What impact has COVID-19 had on the Sector in the Q2 and Q3 2020?
- What could recovery look like over the next five years?
- What are the key challenges facing the Sector as it moves through recovery?

The intention of the report is to provide further insight into the current state of the Sector and what recovery could look like. These findings will provide Te Waihanga with information that can support the delivery of its remit to lift infrastructure planning and delivery to a more strategic level and improve the long-term economic performance of the nation.

This report focuses on the impacts of the COVID-19 pandemic only and excludes longer term sector considerations of technology and climate change, which will be addressed in Te Waihanga's forthcoming 30-year strategy. We also acknowledge the significant ongoing work around the reform of the Resource Management Act (RMA) and Local Government, including Three Waters. This report will not attempt to address these specific reforms.

Te Waihanga is committed to lifting infrastructure planning and delivery to a more strategic level and, by doing so, improving New Zealanders' long-term economic performance and social, cultural and environmental wellbeing. Te Waihanga is determined to capture the best elements of the recovery of the Sector and is supporting initiatives through the Construction Sector Accord and engaging in its own primary research.

Defining the Sector

Infrastructure is a system of inter-connected physical structures which consume capital to produce services that enhance wellbeing. Examples of infrastructure include transport, three waters, energy, telecommunications, social infrastructure such as schools and hospitals, commercial and residential property.

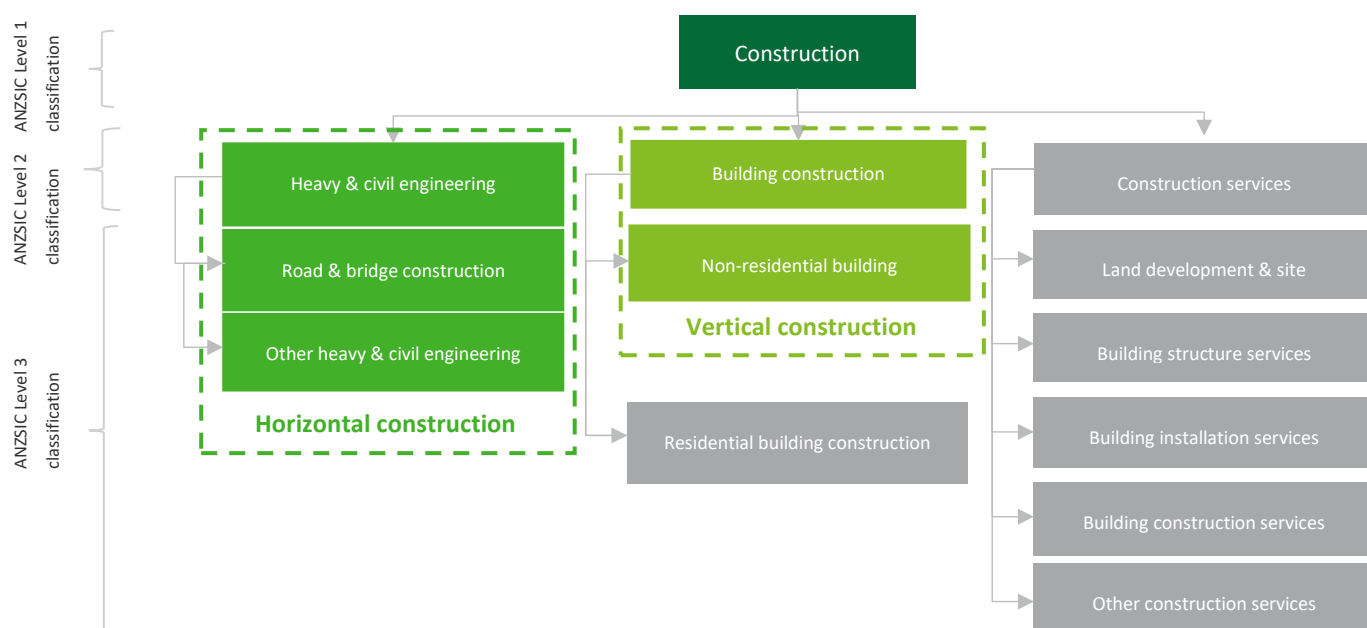
The Sector includes three sub-sectors: horizontal, vertical and residential construction. The Sector also captures construction related activities.

The focus of this report is on the horizontal and vertical sub-sectors but refers to residential construction and construction related activities where relevant.

Horizontal construction is construction of a non-building type such as roads, bridges, utilities and other civil works. Vertical construction comprises of building types other than residential structures, including hotels, offices, retail outlets, industrial buildings and social infrastructure such as prisons, schools and hospitals.

The standard industrial classifications used by Statistics New Zealand (Stats NZ) define construction as comprising heavy and civil engineering construction, building construction and construction services. Building construction is disaggregated into non-residential and residential construction. The figure below illustrates how this report maps the infrastructure-related construction sub-sectors to the standard industrial classifications.

Figure 1 ANZSIC industrial classifications and the definitions used throughout this report



Source: Deloitte based on Statistics New Zealand

Approach

Deloitte developed a tailored approach to identify the impact and shape of recovery for the Sector. To complement existing research and literature, several primary research methods were used to analyse the Sector.

Table 1 Primary analysis conducted during this project

Analysis	Description
Sector survey (referred to as the C-19 Recovery Survey)	Deloitte and Te Waihangā conducted a targeted new survey on the impacts of COVID-19 on the Sector and opportunities to support recovery. The survey was distributed from September to October 2020 to businesses across all regions, sizes, maturities, and operations. Businesses answered questions about pre COVID-19 revenue, location, maturity, along with questions ranging from COVID-19 impacts in Q2 and Q3 2020, roadblocks to recovery, capacity to meet flagged stimulus, and suggested recovery measures. See Appendix B for more detail.
Collaboration across agencies	We collaborated with a number of agencies to gain insights and customised data on the Sector, including MBIE, Statistics New Zealand, Immigration New Zealand, the Companies Office and Te Waihangā.
Stakeholder consultations	We conducted interviews with representatives from sector peak bodies across all the segments of the Sector. These interviews were designed to understand the impact of COVID-19 on firms along with infrastructure supply and demand, opportunities and challenges, overall sentiment in the market and possible stimulus initiatives to support recovery. See Appendix A for more detail.

Source: Deloitte

This report is organised to reflect the impact of COVID-19 on the Sector and recovery over the next five years:

Part A: The COVID-19 context

- **The Sector pre-COVID-19:** We assessed the pre-pandemic state of the Sector to provide a baseline against which the impact of COVID-19 can be assessed. Data was obtained from several official sources, including the Companies Office, Statistics New Zealand and MBIE, to assess output and expenditure, employment, the structure of the Sector, and demand prior to COVID-19. Demand for the Sector is defined as both public and private demand for infrastructure from the MBIE Construction report and Te Waihangā's infrastructure pipeline.
- **The impact of COVID-19:** The impact of COVID-19 on the Sector in Q2 and Q3 2020 was ascertained based on:
 - Sentiment data from publicly available data sources, existing surveys in the Sector, and customised sub-sector data collected from the Companies Office and Statistics New Zealand.
 - Our C-19 Recovery Survey.
 - This information was compared to other sector surveys and research to provide a richer and more balanced picture of the impact of COVID-19 on the Sector at a firm level.
- **Recovery over the next five years:** A directional outlook of what recovery for the Sector could look like was developed, drawing on the MBIE's 2019 National Construction Pipeline Report, sector expertise and survey results.

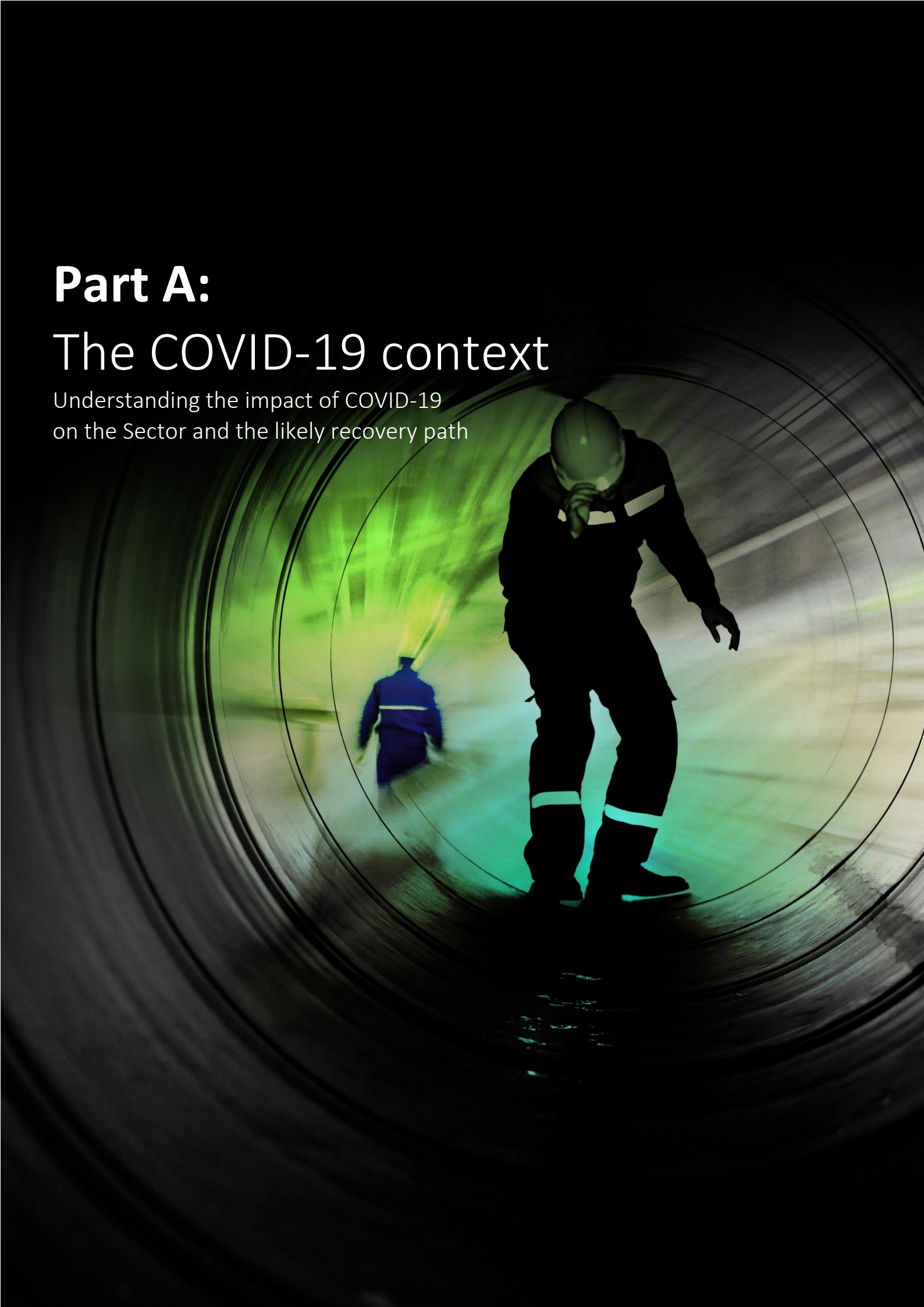
Part B: Challenges and opportunities

Opportunities to address challenges amplified by COVID-19 to recovery: We identified opportunities to address the challenges amplified by COVID-19 to support recovery based on desktop research and stakeholder interviews with representatives from sector peak bodies.

Part A:

The COVID-19 context

Understanding the impact of COVID-19
on the Sector and the likely recovery path



State of the Sector prior to COVID-19

Infrastructure-related construction is an important contributor to the New Zealand economy, and up until 2019, the state of the Sector appeared positive but with headwinds.

This section examines the output and expenditure, demand, employment and structure of the Sector prior to COVID-19.

Output and expenditure

The construction sector is a major contributor to economic activity, accounting for just under a tenth of the economy's output and just over a tenth of total expenditure.

In the year ending December 2019, the total construction sector made up 6.9% of GDP. Spending on construction comprised 11.9% of national spending. The distribution of spending across the sub-sectors was as follows:¹

- Horizontal construction was \$7.3bn, or 23% of total construction expenditure.
- Vertical construction was \$7.4bn, or 24% of total construction expenditure.
- The residential sector makes up just over half of the construction sector (53%), with expenditure of \$16.1bn in the December 2019 year.

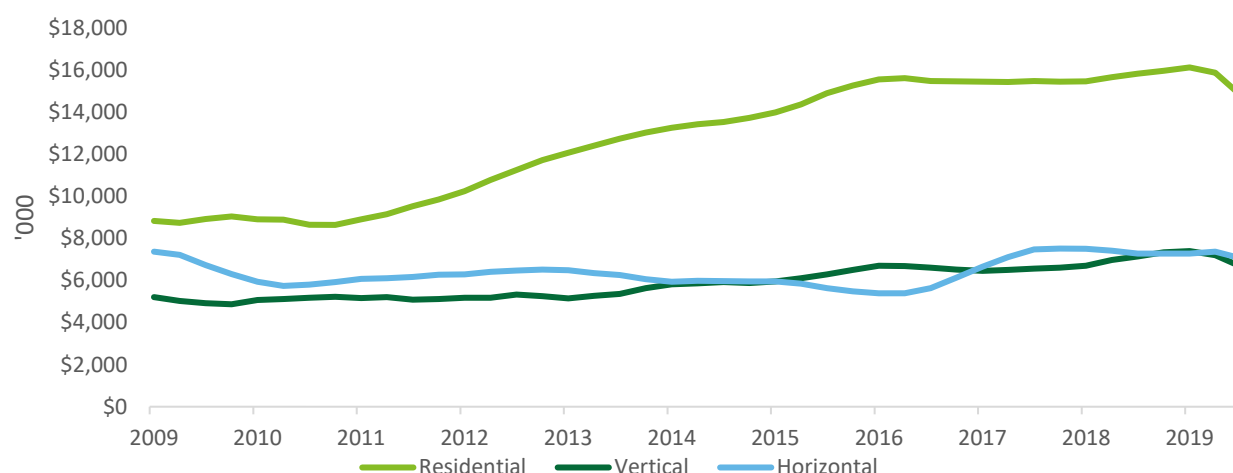
Growth in the Sector has outpaced that of the national average in recent years. In the five years to 2019, the vertical and horizontal sectors grew at an average annual rate of 4.9% and 4.2%, respectively. This compares to national average annual GDP growth of 3.5%.

However, while residential sector expenditure has grown over the past 10 years, vertical and horizontal sectors expenditure remains at a similar level. Chart 1 shows annual **horizontal construction** activity peaked in June 2018 but was at the same level in 2019 as it was 10 years earlier, at \$7.2bn. Overall, spending on horizontal construction declined from 34% of total construction spending in 2010 to 24% in 2019. As the horizontal sector is largely publicly funded, this downward trend will reflect changes in Government expenditure on infrastructure.

Vertical construction, mostly driven by private investment, remained relatively stable at 23% of total construction spending in both 2010 and 2019. Chart 1 also shows that **residential construction** increased from 43% of total construction spend in 2010 to 53% in 2019.

¹ GDP (E) is used for relevant data and calculations – we acknowledge that although the production measure is the most common GDP measure, the expenditure measure is used in this case as it allows for a breakdown of construction sub-sectors. Source, data provided by Statistics New Zealand.

Chart 1 Construction sector GDP (E) (real terms), \$'000



Source: Statistics New Zealand

Employment

The total construction sector is a significant national employer. The Sector employed 10% of FTEs in 2019 and employment has grown at a similar pace to GDP.

The total construction sector employed approximately 172,900 fulltime workers in 2019, compared to 136,000 in 2015 and 108,000 in 2010.² Table 2 displays the breakdown in employment across construction sub-sectors. Building construction (including both residential and vertical sectors) and horizontal sector construction account for 24% and 21% of construction employment, respectively. In particular, residential construction accounts for 17% of the construction sector and vertical construction account for 7%. Construction services accounted for 55%, including building completion services (10%), building installation services (23%), building structure services (6%), land development and site preparation services (6%) and other construction services (10%).

Table 2 Construction sector employment, year to September 2019

	Full-time employees ('000), annual average	% of total construction sector
Building construction	41,063	24%
Residential building construction	29,180	17%
Non-residential building construction (vertical sub-sector)	11,880	7%
Heavy and civil engineering construction (horizontal sub-sector)	36,525	21%
Construction services	95,290	55%
Building completion services	17,313	10%
Building installation services	39,693	23%
Building structure services	9,718	6%
Other construction services	17,615	10%
Land development and site preparation services	10,950	6%
Total Construction	172,878	100%

² This definition of the construction sector includes the residential construction sector.

Source: Statistics New Zealand



A wide variety of occupations, skills, and skill levels are required across the construction sector. There is a strong concentration of technicians and trades workers, machinery operators and drivers, and labourers in the construction sector, at 57%. Almost a third (32%) of construction worker employees were professionals and managers (highly qualified workers). Details of occupations by ANZSIC Level 1 construction sector are presented in Table 3 Construction sector occupations, Census 2018.

Table 3 Construction sector occupations, Census 2018

Occupations within construction sector	% of total construction sector
Managers	25%
Professionals	7%
Technicians and Trades Workers	37%
Community and Personal Service Workers	1%
Clerical and Administrative Workers	8%
Sales Workers	2%
Machinery Operators and Drivers	8%
Labourers	12%
Total	100%

Source: Statistics New Zealand

The Sector is facing a domestic skills shortage. The range of skills needed in the construction sector are not all home-grown, nor in abundant supply, including specialised expertise in civil, water and structural engineering. Specialist rail knowledge, and project management – particularly in vertical infrastructure – are also in demand. The C-19 Recovery Survey suggested 20% of firms in the Sector have at least half of their employees on a working visa. In fact, some areas of infrastructure expertise, like tunnelling, are almost entirely sourced from overseas. Simply put – without the right mix of skills and people, the ability to deliver the infrastructure pipeline and unlock significant domestic employment opportunities appears fragile, even prior to COVID-19.

Structure of the Sector

Businesses in the Sector accounted for 11.4% (or 66,264) of total businesses in 2019. Table 4 presents the distribution of these businesses by construction sub-sector and growth between 2000 and 2019.

Table 4: Business units, by ANZSIC Level 2 Construction subsectors

	2000	2019	Growth between 2000 and 2019
Building Construction (including both vertical and residential construction)	27,645	40,641	47%
Construction Services	13,035	23,358	79%
Heavy & Civil Engineering Construction (horizontal construction)	1,749	2,265	30%

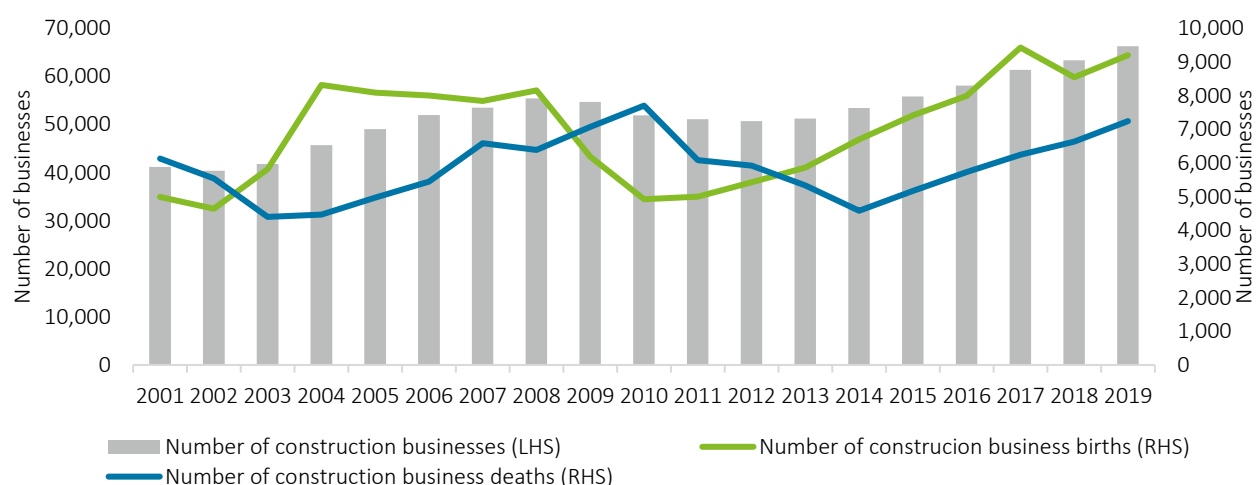
Source: Statistics New Zealand

Building construction, which captures both vertical and residential construction, accounts for the largest number of New Zealand construction businesses, due to the proportionately high number of sole traders. Sole traders are however more vulnerable to a downturn in activity resulting from economic recessions and external shocks.

Horizontal construction firms are underrepresented in terms of business units relative to the rest of the Sector, as it consists of a smaller number of very large firms. Large firms generally have a greater ability to absorb economic shocks, however, there are examples of large firm failures in the New Zealand context in recent years.

Chart 2 presents the number of construction sector business “births and deaths” over the past 20 years. The data shows that during the GFC, there was a significant decrease in construction sector “births”, while at the same time an increase in “deaths” up to 2013. Post 2013, an inflection point occurred in the relationship between “births and deaths”, where the number of births exceeded the number of deaths, as the Sector recovered from the GFC.

Chart 2 Total construction businesses vs births and deaths of construction businesses



Source: Statistics New Zealand

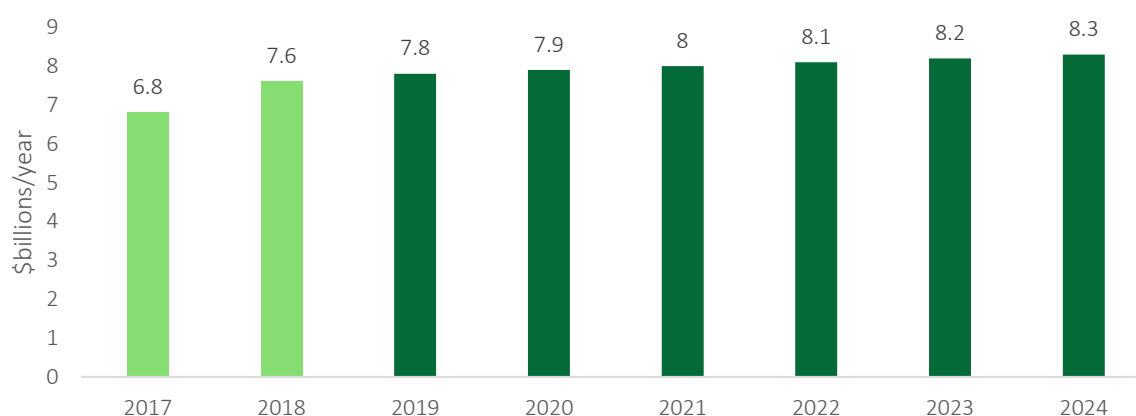
Demand

For the purposes of this report, we have derived our estimate for the infrastructure-related construction sector from the 2019 MBIE Construction Pipeline report for infrastructure projects.

Horizontal infrastructure approvals and work delivered is heavily influenced by Government policies, such as NZUP³. This section only considers approvals and works in the December 2019 year. In 2019, MBIE's Construction Pipeline Report forecast the infrastructure pipeline to grow gradually from \$7.6bn in 2018 to a peak of \$8.3m in 2024.⁴

Before the pandemic, the Government was already progressing a large infrastructure programme consisting of major projects and smaller works. In early 2020, the Government announced \$12bn of additional infrastructure spending, \$6.8bn of which was earmarked for transport infrastructure, bringing its total forecast infrastructure spend to \$41bn between 2019 to 2023. This investment was intended to address the existing infrastructure deficit, boost economic activity, and improve road and rail transport.

Chart 3 Horizontal sector infrastructure pipeline, 2019 to 2024



Source: MBIE 2019 Construction Pipeline Report

Local government is the largest investor in horizontal infrastructure. According to MBIE 2019 data, local government accounts for 47% of all projects planned for delivery over 2019 to 2024. Central government and the private sector account for 28% and 25% of planned investment, respectively. Transport is the largest category of investment by central government, while subdivisions are the largest for the private sector.

Vertical infrastructure had a strong pipeline, off the back of stronger population growth and a positive economic environment.

The vertical sector, predominantly driven by private investment, was experiencing strong growth prior to COVID-19. Population growth and positive economic conditions were drivers for this buoyancy.

According to the 2019 MBIE National Construction Pipeline Report, commercial buildings were forecast to represent 59% of the total value of vertical infrastructure activity from 2019 onward. Education had a smaller share of total value (11%) but has the largest number of projects forecast from 2019.

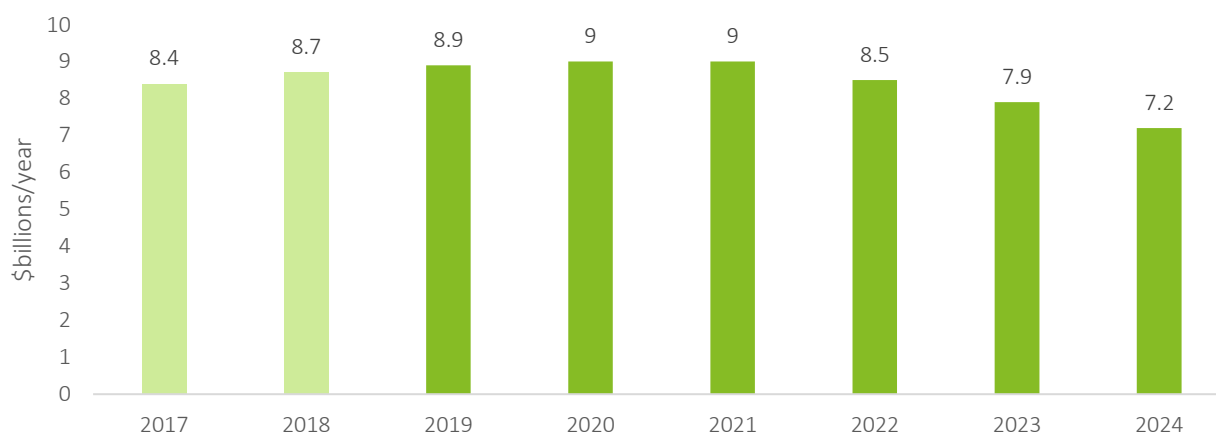
The private sector was forecast to be the largest initiator of non-residential building, contributing 65% of the value of intentions over the forecast period, while central and local government made up 20% and 15% respectively.

³ The NZ Upgrade Programme was not initially intended as a COVID-19 recovery package.

⁴ MBIE (2019), National Construction Pipeline Report 2019

In 2019, MBIE forecast the non-residential pipeline to peak at \$9bn in 2021 but then steadily decline to \$7.2b in 2024. The vertical infrastructure pipeline in 2019 suggested continued strong demand for commercial buildings and other types of vertical infrastructure. Pre-COVID investment intentions for Central and Local Government generally remained strong throughout the forecast period. In contrast, private sector projects were more heavily skewed towards the shorter term due to a combination of optimisation bias and planning that is based on a shorter-term horizon reflecting the nature of market demand in this part of the Sector.

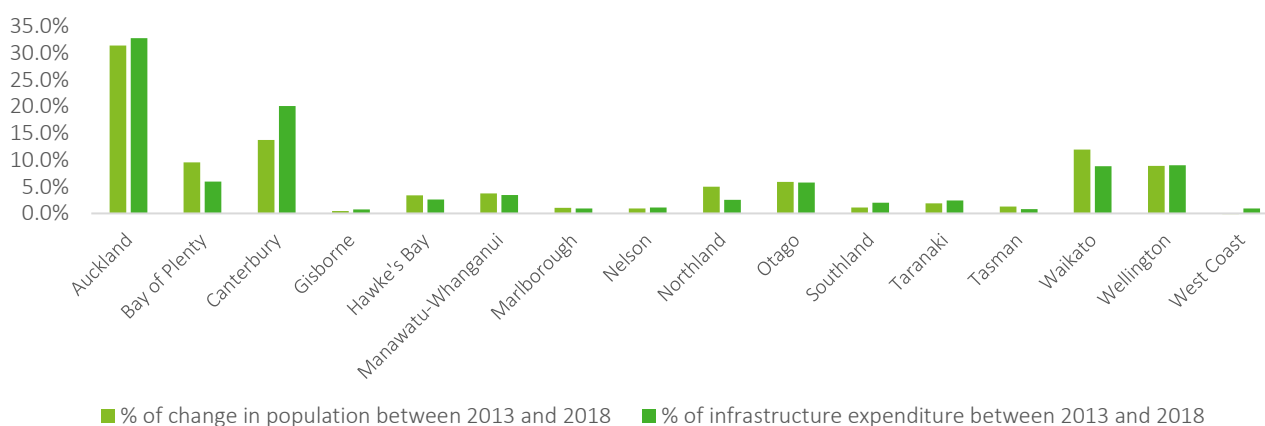
Chart 4 Non-residential construction activity nationally, \$ billion/year



Source: MBIE 2019 Construction Pipeline Report

Regional expenditure patterns tend to reflect recent population growth trends, with high growth councils of Hamilton, Tauranga, Auckland, and Queenstown contributing a high proportion of recent construction expenditure. Chart 5 illustrates the regional distribution of the total construction sector between 2013 and 2018 as well as population growth between the 2013 and 2018 censuses. Auckland accounts for the largest proportion of construction GDP, at 31% of total activity between 2013 and 2018. A further 45% of construction activity is attributable to the rest of the North Island and the 24% was in the South Island.

Chart 5 Proportion of construction sector GDP and population growth between 2013 and 2018

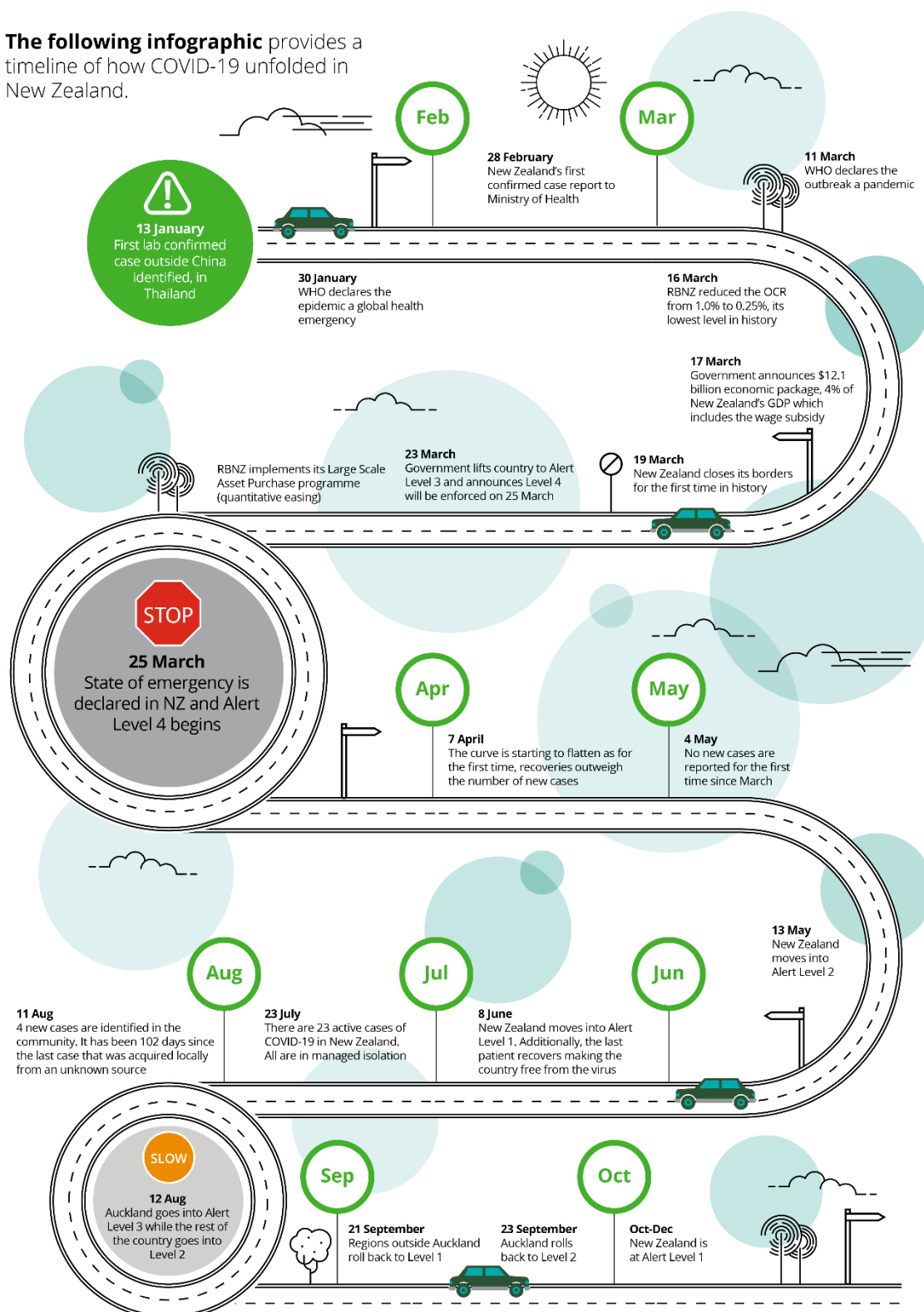


Source: Statistics New Zealand

COVID-19 disrupted the Sector

The impact of COVID-19 has made 2020 the most turbulent year in recent history.

The following infographic provides a timeline of how COVID-19 unfolded in New Zealand.



Broad impacts of COVID-19

Compared to many other countries, New Zealand performed relatively well both in its fight against the virus and its fight to save the economy. But ‘relatively well’ during the worst global recession since World War II, does not mean we are unscathed.

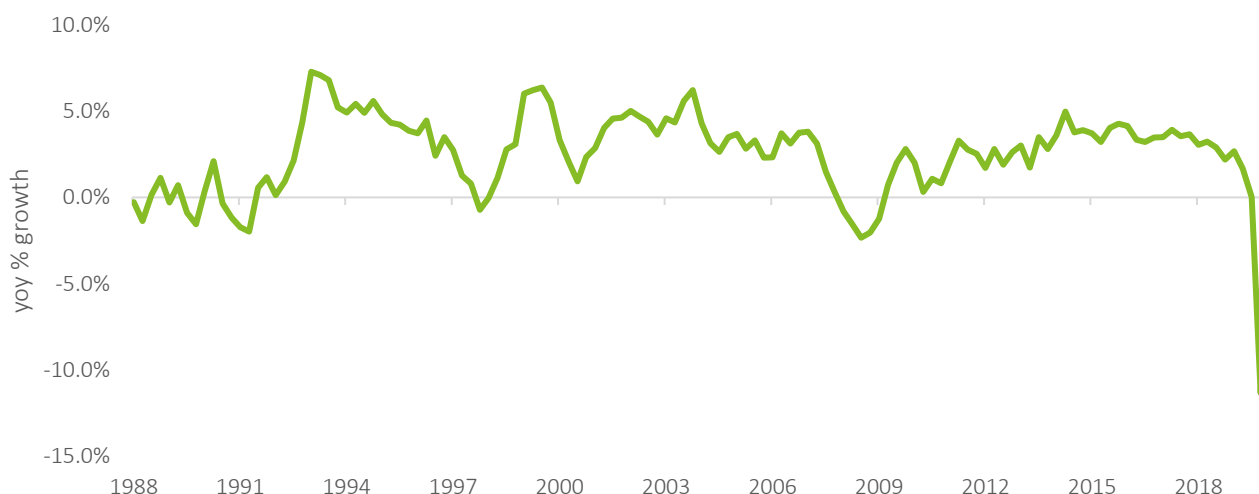
New Zealand has suffered a deep recession, driven by two main causes:

- **Lockdown restrictions** that shut down much of the economy for an extended period; and
- **Persistent economic weakness.** Even as restrictions were lifted, weakness in economic activity persisted as demand had taken a massive hit through low consumer confidence and higher levels of underutilisation.

Chart 6 shows the significant toll COVID-19 has taken on New Zealand’s economy, with our main measure of economic activity (real GDP) falling by 12.2% in the June 2020 quarter alone. This was at the height of national disruption and represented a very different environment to the one enjoyed by New Zealand today, where growth has rebounded.

The economy rebounded strongly in Q3 2020, lifting 13.8% from Q2 (seasonally adjusted). On an annual basis, the economy was 0.2% higher in Q3 2020 than it was the same period a year earlier. A continued low interest rate environment, which will be further supported by the RBNZ Funding to Lending programme and potentially negative interest rates, the strong residential property market, increasing consumer and business confidence will support recovery over the near term. However, the economy is facing significant headwinds, with weak global conditions the removal of the wage subsidy negatively impacting firms and employment throughout Q4 2020 and Q1 2021.

Chart 6 Gross Domestic Product, year-on-year percentage growth, 1988 to 2020



Source: Statistics New Zealand

Domestic impact on the Sector

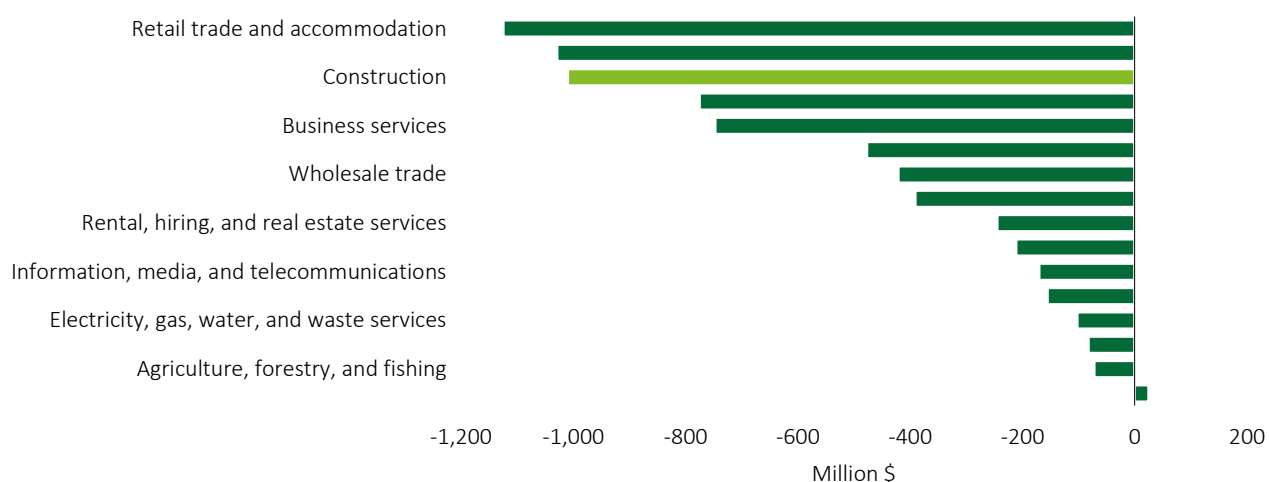
The direct impacts of COVID-19 and the associated restrictive measures aimed at limiting the spread of the disease had a material effect on the Sector. These effects resulted from the inability of many construction firms to operate at full capacity, or at all, during Alert Level Four and Alert Level Three (“the lockdown”). After the lockdown measures relaxed and firms were able to operate freely, the Sector started to recover.

We are gaining further insight into this impact daily. The impact on construction activity depended on:

- The degree to which firms can be classified as providing an essential service and the direct limitations on sector activity. Relative to pre-COVID-19 activity, only 19% of the wider construction sector was able to operate during Alert Level Four, and this increased to 85% during Alert Level Three.⁵ While construction was amongst the hardest hit sectors during Alert Level Four, relative to other sectors, it was able to recover faster, given the Sector could operate at close to full capacity during Alert Level Three.
- The response of firms and workers, and wider supply chain implications. Some firms may have chosen to pause operations even though they could be classified as essential, and some operations were impacted by the need to keep workers safe. The Sector cannot be transferred to a remote mode of operation and therefore is one of the most vulnerable sectors to COVID-19.

The sectors hardest hit by COVID-19 disruptions during Q2 2020 were retail trade and accommodation, transport, postal and warehousing, and construction.

Chart 7 Gross Domestic Product by sector, change from Q1 2020 to Q2 2020 (\$ Millions)



Source: Statistics New Zealand

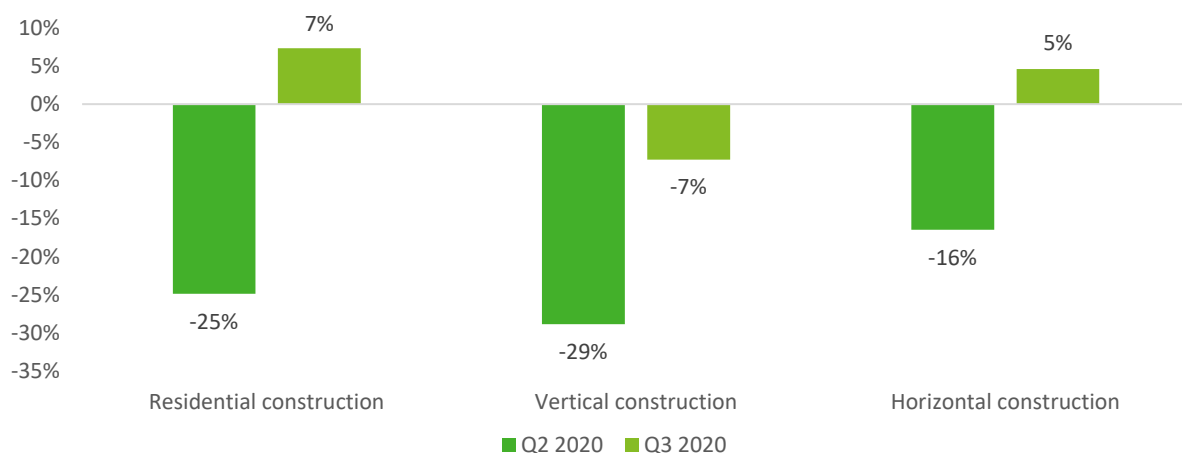
Construction sector activity lifted strongly in Q3 2020 after falling to its lowest level in 10 years in Q2 2020.

Construction sector GDP rose by 54% in Q3 from the previous quarter and is now higher than it was the same period a year earlier.

Chart 8 shows that all three sub-sectors – horizontal construction, vertical construction and residential construction – experienced marked declines during the Q2 2020 but rebounded in Q3 2020. Vertical construction – a sub-sector predominantly driven by private investment – experienced the greatest decline in activity, falling by 29% over Q2 2020 relative to Q2 2019.

⁵ Stannard, Steven, McDonald (May 2020), Economic impacts of COVID-19 containment measures, Reserve Bank of New Zealand.

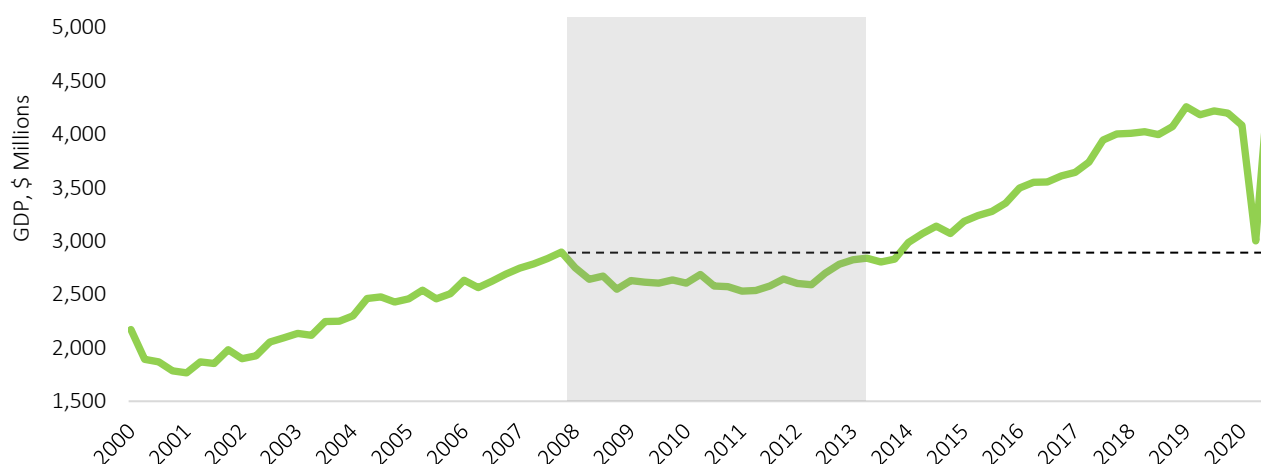
Chart 8 Gross Domestic Product (E), percentage change in Q2 2020 and Q3 2020, relative to the quarter in the previous year



Source: Deloitte, Statistics New Zealand

However, vertical construction still shows negative growth in Q3 2020, relative to the quarter in the previous year and this recovery likely masks the true impact of COVID-19 to the sector. We could see construction activity soften in Q4 2020 and Q1 2021 post removal of the wage subsidy and other government support packages and pre-committed COVID-19 projects phase out. **The construction sector took years to recover following the previous economic recession.** Chart 9 shows this sector took five years to rebound from the GFC (Q1 2008 to Q1 2013). The GFC had a significant impact on the finance company sector – a sector that was largely focused on funding property development directly linked to construction activity.

Chart 9 Construction activity, seasonally adjusted, quarter-on-quarter change, Q1 2000 to Q3 2020



Source: Deloitte, Statistics New Zealand

COVID-19 however raises a number of new complexities, including border closures within and between countries, a dual supply and demand shock, risks around the interconnected global supply chain, and interest rates close to zero. It is possible the Sector will see a faster bounce back relative to the GFC as the downturn in this crisis was caused by restrictions, rather than underlying demand or supply problems before the crisis hit. We note that in this crisis, the Reserve Bank has limited residual ammunition, with interest rates being close to zero, so fiscal policy support is important to further support the Sector during recovery.

Input indicators fell materially in the wake of COVID-19, but data shows a rebound since Q3 2020. For example, prior to COVID-19, it was estimated that the steel sector had 36% spare capacity, this increased to 47% during the June quarter, improved to 40% in the September quarter and is expected to be at 35% in 2021 – back at pre-COVID-19 levels.⁶ Ready-mix concrete volumes dropped 9.5%, having been increasing at an annual average rate of 4.7% between 2015 and 2019. Volumes in ready-mix concrete showed a strong rebound in Q3 2020, indicating that most of the Sector is back in operation.

Chart 10 Ready-mix concrete volumes, seasonally adjusted Q1 2000 to Q3 2020 (m3, thousands)



Source: Statistics New Zealand

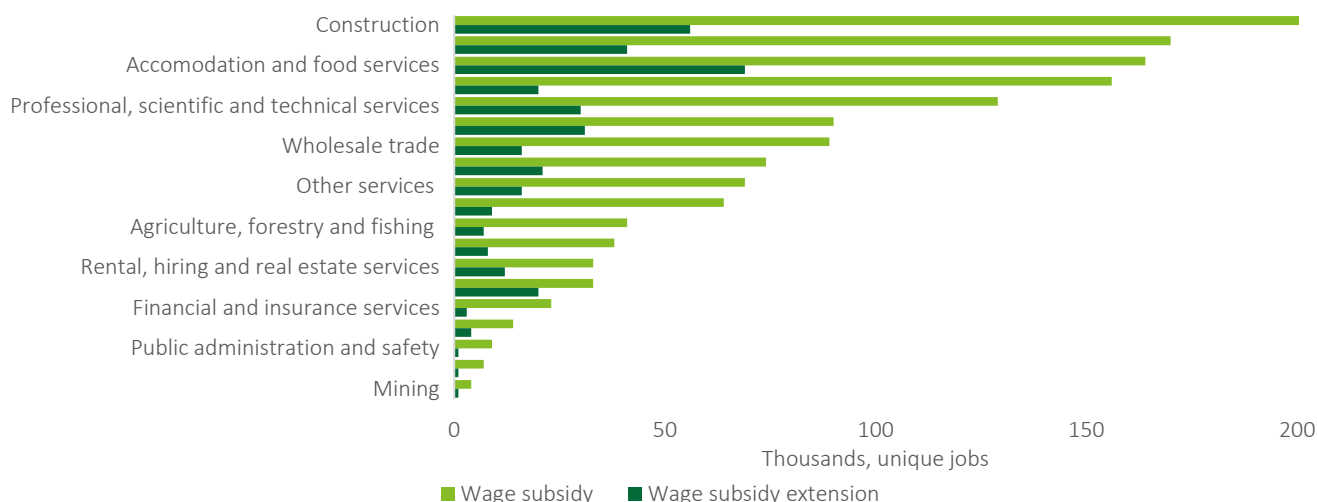
In the C-19 Recovery Survey, firms were asked if they had experienced an impact on their cost of materials. Some firms reported that they had received invoices for higher amounts for certain items, which were attributable to supply chain constraints. Firms also noted they had seen an increase in cost for imported products due to a weaker New Zealand dollar. Overall, 83% of firms expect the cost of materials to increase in line with inflation or above.

- **Employment.** The impact of COVID-19 on the Sector is reflected in the significant uptake of the wage subsidy, hours worked and underutilisation.
- **Wage subsidy support.** In all, 203,000 construction jobs were supported by the initial wage subsidy – the highest number of jobs for any sector. The wage subsidy extension saw 56,000 construction jobs supported, the second highest for any sector. This high reliance on government support raises a potential question of the Sector's stability now that the wage subsidy has ended.

Firms which responded to our C-19 Recovery Survey reiterated the importance of the wage subsidy in helping them to keep employees. This reliance on the subsidy was validated by interviews with peak bodies, which cited the wage subsidy as crucial for survival until stimulus projects were ready to get underway. According to the C-19 Recovery Survey sample, 49% applied for the wage subsidy and, of those, 83% said it saved jobs within their firm. 70% said it was easy or very easy to access, and 72% either agreed or strongly agreed that it was provided in a timely manner. Across the vertical and horizontal sectors, 60% of those in the vertical sector applied, compared to 42% in the horizontal sector.

⁶ Steel Construction Limited (2020), Structural Steel Industry Updates in February, June, September, December 2020.

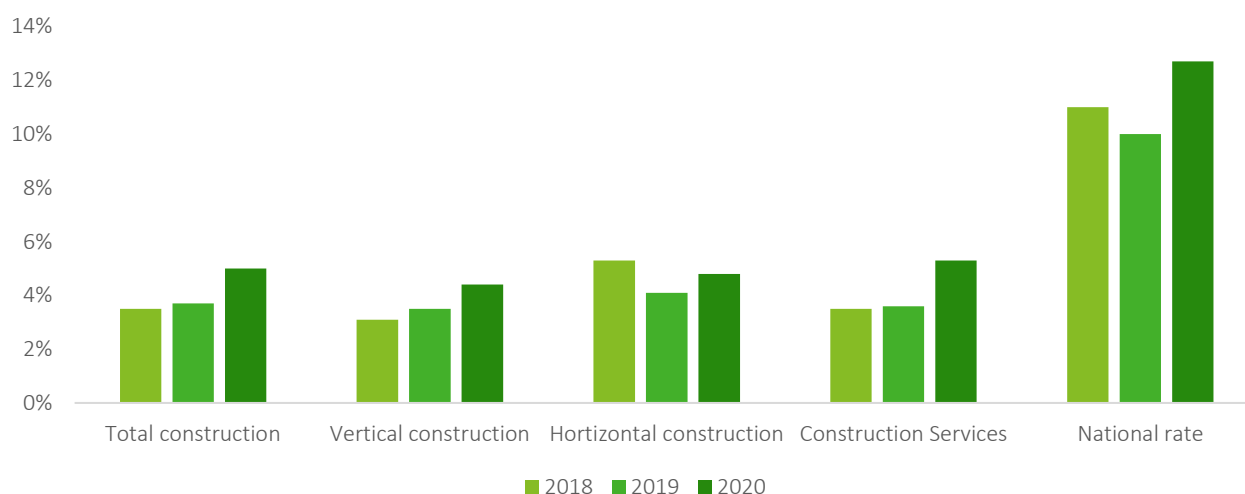
Chart 11 Number of unique jobs on the wage subsidy by sector (thousands)



Source: Ministry of Social Development

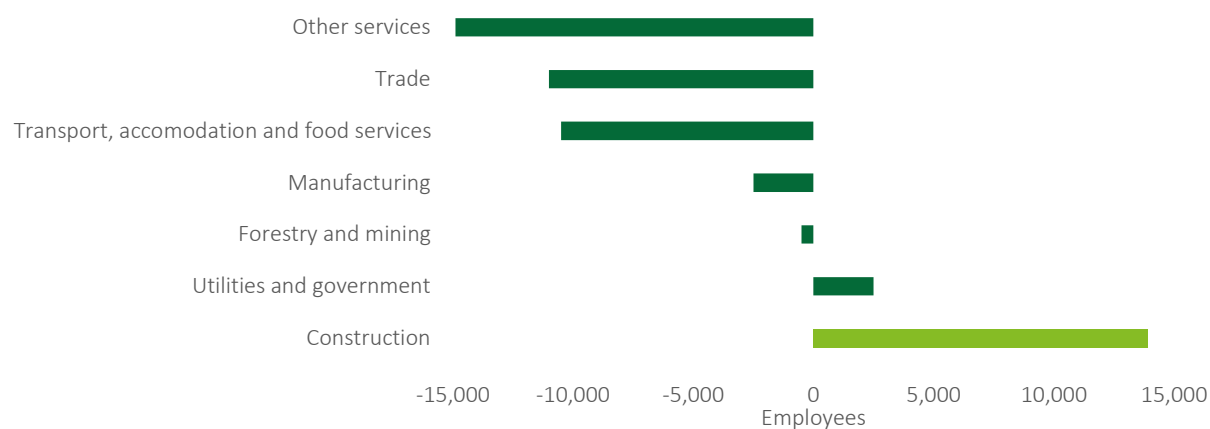
- Hours worked.** The impact of COVID-19 is also observed in the significant drop in the hours worked in the construction sector. The change from Q1 2020 to Q2 2020 was:
 - Vertical construction: -14.6%
 - Horizontal construction: -12.6%
 - Construction services: -10.3%
- Underutilisation.** The underutilisation rate is a broader measure of untapped capacity in the labour market. The underutilisation rate, as at September 2020, has increased across all sub-sectors in the Sector. Higher underutilisation suggests there is more spare capacity in the Sector than overall employment figures suggest.

Chart 12 Underutilisation rate across sub-sectors (September 2018 to September 2020)



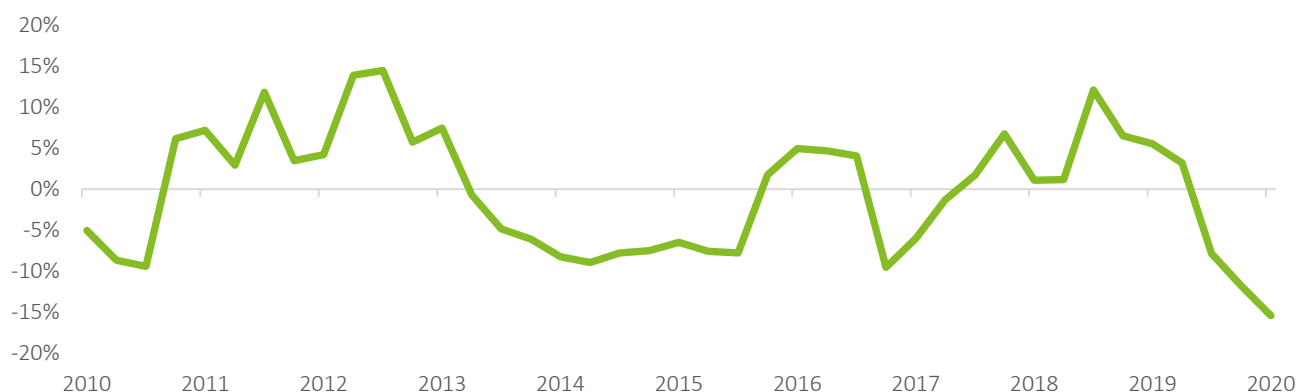
Source: Deloitte, Statistics New Zealand

Despite the significant impact of COVID-19 on hours worked and underutilisation, employment in the construction sector has increased since the start of March 2020. However, employment weakness is expected in the coming months as the wage subsidy rolls off and uncertainty endures.

Chart 13 Employment by selected sector (changes between Q1 2020 and Q2 2020)

Source: Deloitte, Statistics New Zealand. Note: sectors not presented are public administration and social assistance; arts recreation services; other services; electrical, gas, water and waste services; retail trade; not elsewhere classified; mining; financial and insurance services; wholesale trade; financial and insurance services; agriculture, forestry and fishing.

Productivity is a well-known challenge for the construction sector. Productivity, at a low level relative to other sectors pre-COVID, was negatively impacted during COVID-19 lockdowns as a result of new health and safety requirements. With most construction deemed not to be an essential service during Alert Level Four, only 19% of the Sector was able to operate relative to pre COVID-19 levels. Over the June 2020 quarter, productivity dropped within a range from 5% to 20% according to the majority (70%) of respondents to the C-19 Recovery Survey. When we measure productivity as the output per hour worked, productivity growth remains well below its post-GFC peak, decreasing to its lowest level in 10 years in Q2 2020. Chart 14 shows the estimated output per hour worked between 2010 and 2020.

Chart 14 Annual percentage change in productivity Q1 2000 to Q2 2020 (measured as output per hour worked)

Source: Deloitte, Statistics New Zealand

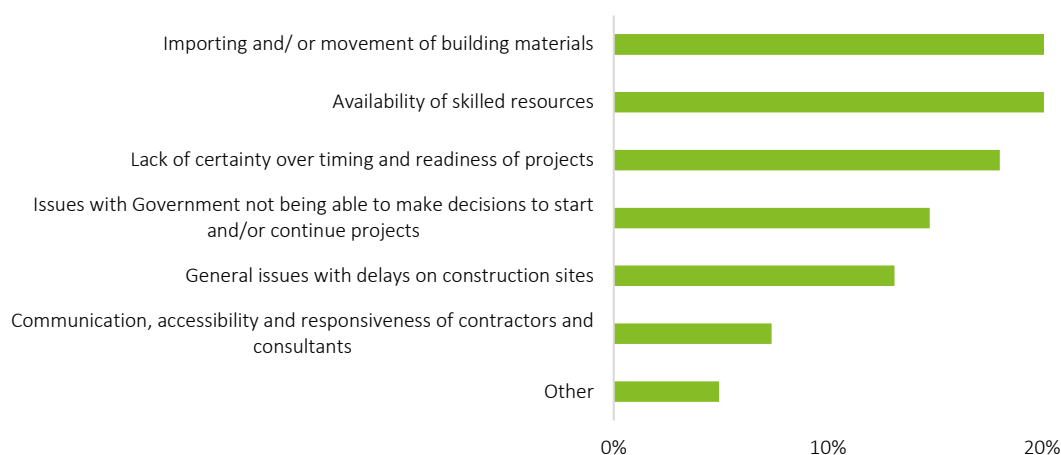
Productivity in this sector tends to be cyclical, picking up when business conditions are strong and easing again when conditions weaken. As the country moves into the recovery phase it is expected to lead to efficiency gains as some unproductive firms go into liquidation and employees are redeployed to more productive firms or other parts of the economy.

Firm level impacts

Businesses faced disruptions to their supply chains earlier this year. Just over half of respondents in the C-19 Recovery Survey acknowledged COVID-19 caused supply chain disruptions in Q2 and Q3 2020. Firms across the horizontal and vertical sectors were similarly impacted by supply issues. The key reasons for supply chain disruptions were:

- Difficulties with the importing and movement of building materials
- Lack of available skilled resources
- Lack of certainty over timing and readiness of projects

Chart 15 Key reasons for supply chain issues (% of total responses)



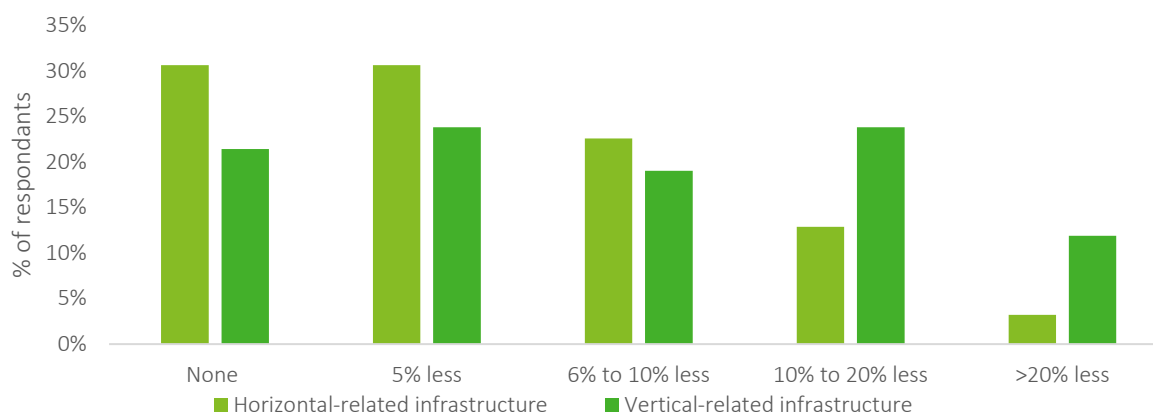
Source: C-19 Recovery Survey

Most stakeholders interviewed indicated disruptions in the movement of building materials have eased; however, access to resources and materials and timing of projects remain a concern. As we moved closer to the peak Christmas season, there was congestion around ports. In December, Ports of Auckland operated at only a third of its crane capacity and some shipping lines are choosing to bypass New Zealand or cancel dedicated trans-Tasman services.⁷ Congestion at the ports will worsen and not ease until the second quarter of 2021, according to Maersk.

Firms faced a negative impact on revenues in Q2 and Q3, irrespective of size. Of those surveyed in our C-19 Recovery Survey, 73% expect turnover to decrease by 5% or more in Q2 and Q3 2020, and 44% of these were businesses with turnover of more than \$100m. While 27% of the survey respondents expected no change in turnover relative to pre-COVID-19 levels. Presented in Chart 16, 36% of vertical firms expected turnover to be impacted by 10-20%+, compared to 16% of horizontal firms.

⁷ Business Desk (10 November 2020) Port bottlenecks stoke Christmas stocking concern

Chart 16 Proportion of respondents who selected answers to “What is the expected impact on turnover in Q3 2020 for your New Zealand operations?”, by type of firm.



Source: C-19 Recovery Survey

A similar impact was observed in the survey conducted by Civil Contractors New Zealand (CCNZ). Of the 188 respondents, 47% expect turnover to shrink over the next 12 months i.e. between June 2020 and April 2021. Conversely, 23% of respondents expect turnover to grow. **Civil contractors operating in the vertical construction sector appear to have been impacted to the greatest extent.** Ongoing uncertainty is likely to weigh on investor sentiment and potentially delay some large projects. Vertical construction represented 14% of projects in 2020, down from 22% in 2019.⁸

Firms based in Auckland felt the negative effects of the August community outbreak as Alert Level Three was enforced throughout the region. Illustrative of this, the C-19 Recovery Survey showed 44% of Auckland firms' turnover fell by 10% or more as a result of the August outbreak.

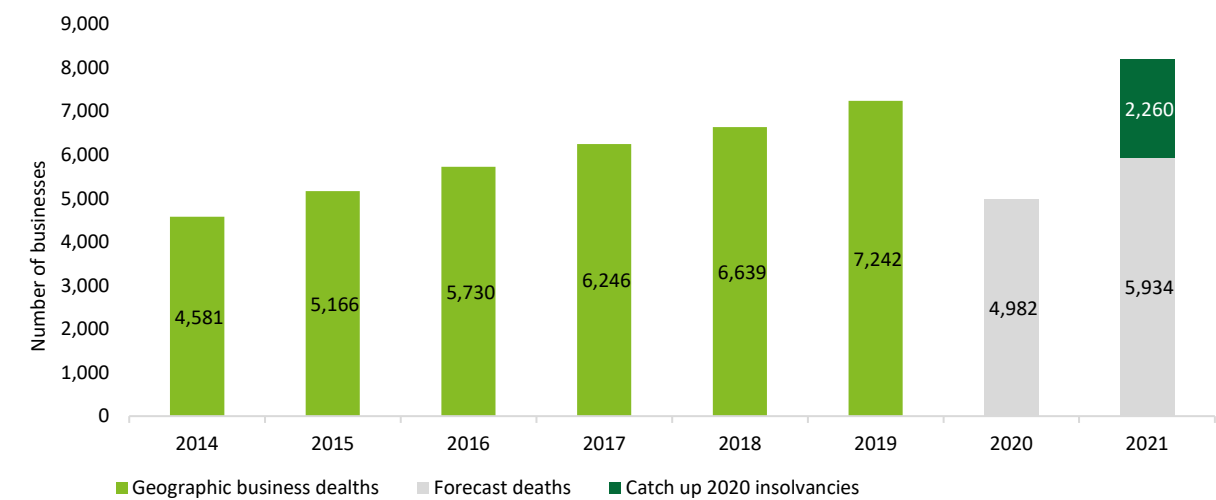
Liquidations in the construction sector have been considerably lower compared to the same period in 2019.

In the June 2019 year, there were 152 liquidations and five insolvencies in the construction sector. This compares to 103 liquidations and three insolvencies in the Sector in the year to June 2020. Liquidations and receiverships decreased across vertical, horizontal and residential construction sub-sectors.

With the end of the wage subsidy and other government stimulus, it is possible that there could be a catch-up in insolvencies in the year to June 2021. This is due to a potential backlog of firms and sole traders that would have ceased trading had the wage subsidy not been in place. To illustrate this point, Chart 17 presents the number of construction company deaths, using expected insolvencies to forecast the potential impact in 2021. Although this estimate of liquidations is potentially conservative, it does reflect a view that an exponential increase in liquidations is unlikely given the swift recovery of the Sector and the government's willingness to provide further support if there are further waves of lockdowns in the future.

⁸ Civil Contractors New Zealand (June 2020), Construction Industry Survey 2020

Chart 17 Number of construction company deaths, historic and forecast view, 2014 to 2021



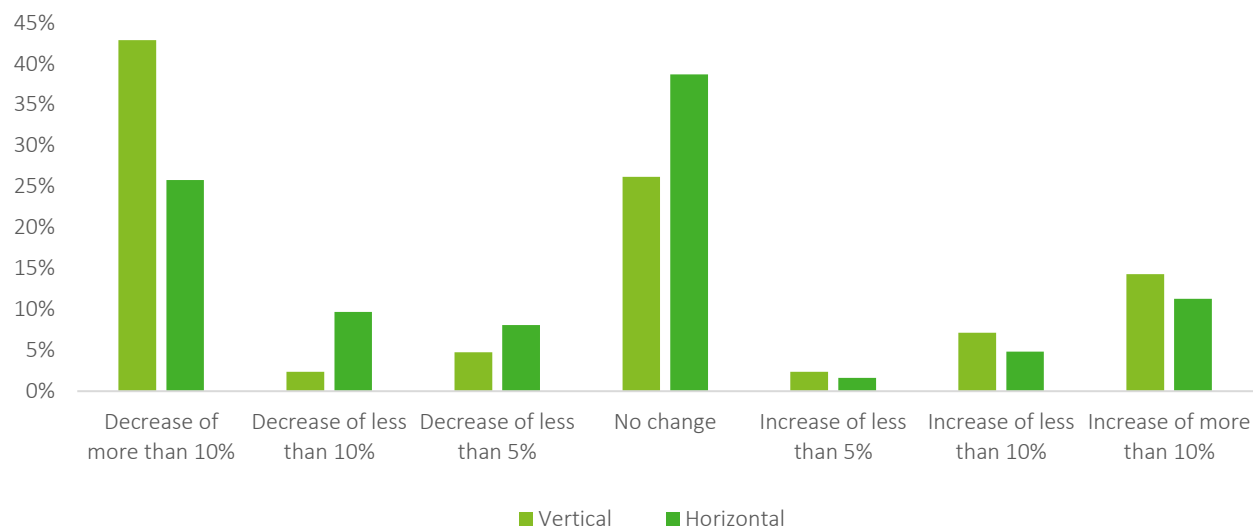
Source: Stats NZ

Source: The number of insolvencies is from Business Births and Deaths; 2020 forecast is based on observed insolvencies 2021 forecast deaths is based on average annual number of deaths 2014 to 2019 from Statistics NZ. Delayed 2020 deaths is the % difference between expected insolvencies in 2020 and the average annual number of insolvencies between 2014 and 2019, based on data sourced from the Companies Office.

Evidence collected suggests private sector investment is cautious, given the uncertainty surrounding stimulus work and the end of wage subsidy support. Respondents to the C-19 Recovery Survey reported they are decreasing training investment budgets and business capital investment. A higher proportion of firms in the vertical sector reported a decline in business capital investment budgets (50% for vertical vs 44% for horizontal), but more in the horizontal sector had decreased their training investment budgets (50% for horizontal vs 45% for vertical).

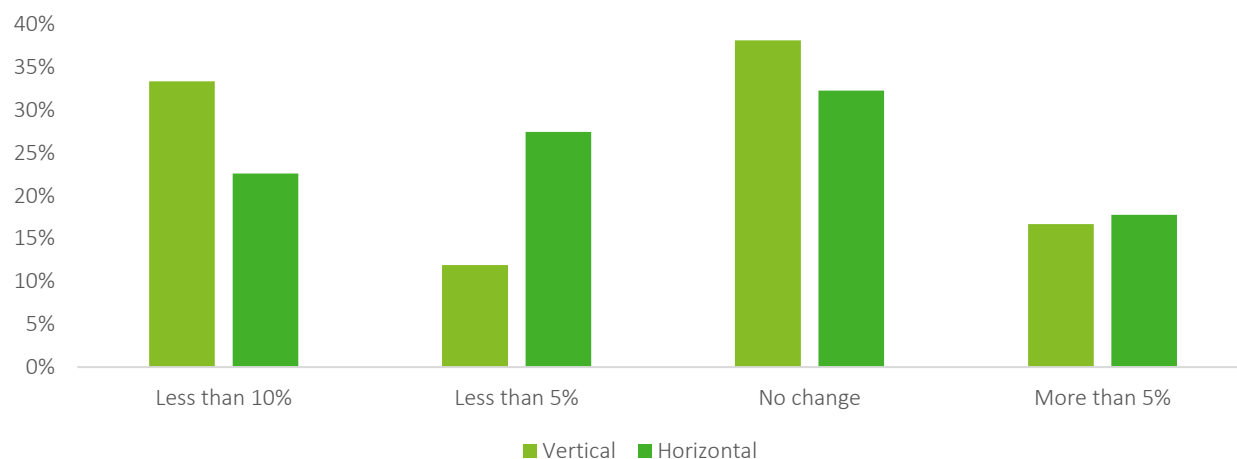


Chart 18 What is the effect of COVID-19 on business capital investment in New Zealand? Please provide a percentage variation relative to your pre-pandemic state.



Source: C-19 Recovery Survey

Chart 19 What is the effect of COVID-19 on training investment budgets and intentions in New Zealand? Please provide a percentage variation relative to your pre-pandemic state.

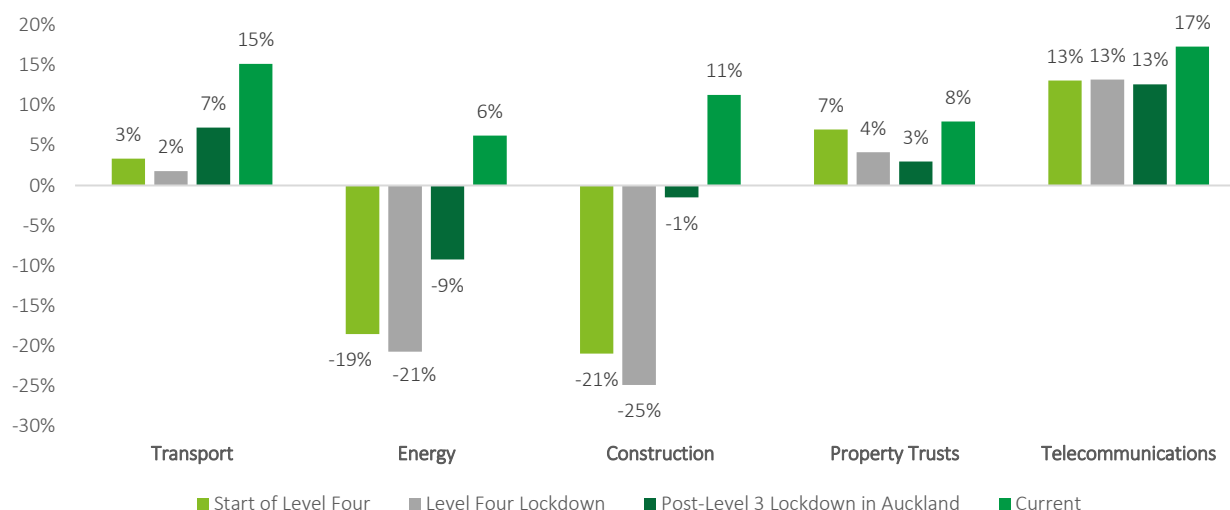


Source: C-19 Recovery Survey

During a deep recession, private investment falls off, and the economy will therefore operate below its potential. These results show that firms may be more unwilling to commit to buying expensive long-lived assets, which in turn affects the pipeline for infrastructure. While financing costs have fallen, some firms noted this is not currently a large factor in their investment decisions. Firms noted uncertainty about future business activity and pipeline are key factors limiting their investment plans. Several firms also reported that they are focussing on investments geared towards increasing resilience and efficiency rather than expansion.

Financial strength of firms appears to have improved. To demonstrate the financial impact on firms, we undertook analysis of NZX movements for companies in key infrastructure sectors during the lockdown and November 2020 relative to the equivalent period one year earlier. Chart 20 and Chart 21 show as New Zealand entered the lockdown period, enterprise values were dropping in the construction and energy sector. All sectors experienced a decline during Alert Level Four, followed by some improvement at the end of the Auckland Alert Level Three and a significant improvement as at November 2020.

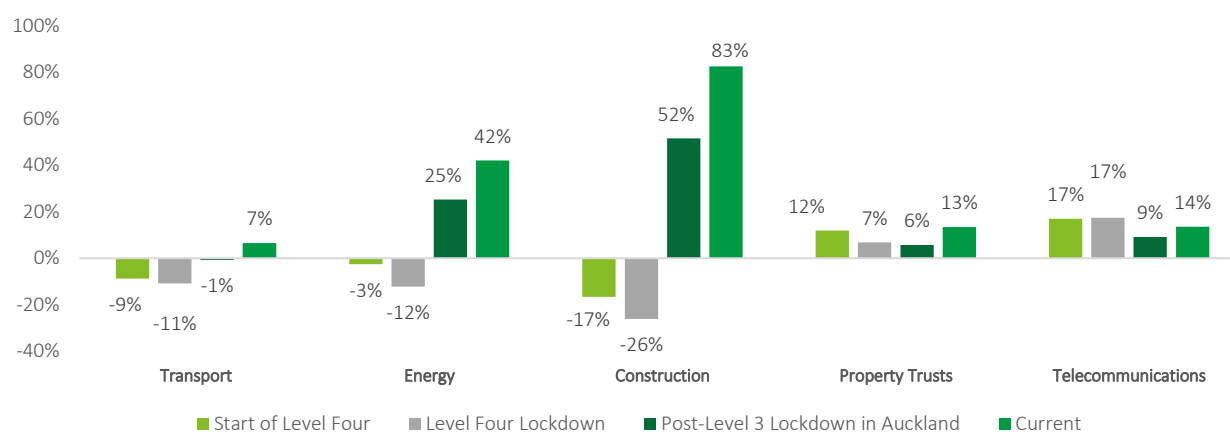
Chart 20 Change in enterprise value by sector relative to the equivalent period last year (Percentage change)



Source: Deloitte calculations based on Capital IQ

Changes in enterprise multiples moved in a similar direction to enterprise values for each sector, with negative growth in lockdown phase for most sectors, and more positive growth since the end of the Auckland Alert Level Three.

Chart 21 Change in enterprise multiples relative to the equivalent value in the period last year (Percentage change)

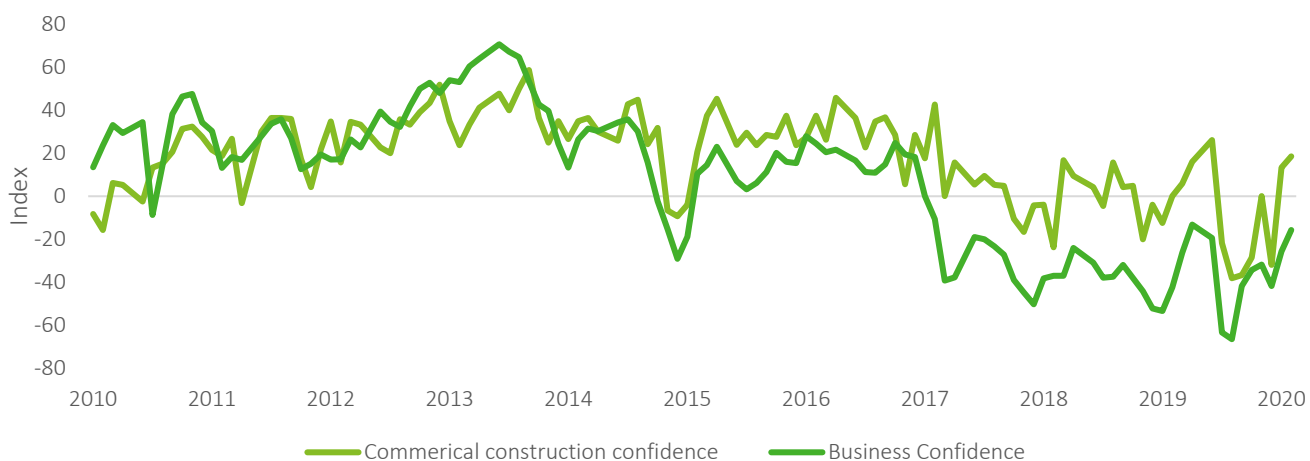


Source: Deloitte calculations based on Capital IQ

Confidence in the construction sector has rebounded, suggesting the Sector may be on the road to recovery.

ANZ's commercial construction indicator saw monthly increases up until September 2019 but the index dropped from 26.1 in February 2020 to -32 in August 2020. The index has since returned to positive levels and was at 18.5 in October 2020, above overall business confidence.⁹

Chart 22 Change in commercial construction confidence and business confidence index, quarterly percentage changes



Source: ANZ Business Outlook Survey



⁹ ANZ (2020), [ANZ Business Outlook survey](#)

The road ahead

COVID-19 has had a significant impact on the Sector, but what could economic recovery look like over the next five years?

The outlook for the Sector is uncertain and depends on a wide range of external factors. The shape of the recovery over the next five years will depend on when a vaccine becomes available, global economic conditions, the extent and effectiveness of fiscal stimulus, and when border restrictions are lifted. The Sector's recovery will also be influenced by critical sector specific uncertainties and external factors. The four key factors that will impact the Sector's recovery:

Regulation, and the degree to which it constrains business activity. Sectors facing substantial ongoing disruption to their business operations due to government restrictions will most likely experience short-term pain and a longer path to recovery. Where sectors have been able to adapt to these restrictions, or face little change in their operations, their path to recovery will likely be quicker. The lifting of travel, physical distancing and gathering restrictions marked the start of the Sector's recovery. Future changes to regulations will continue to influence that recovery.

Public demand, and how effectively it can be used to stimulate activity in the Sector. Infrastructure stimulus will underpin the recovery of public sector demand. Shovel-ready projects valued at over \$3 billion provided a positive signal to the market, but further confidence is required around when these will come to the market.

Private demand, and how quickly it will recover as economic confidence returns. Firms continue to be cautious, which is evident in forward-looking investment intentions. Many firms are expecting overall activity to weaken, following the wind down of some government support schemes (e.g. wage subsidy). Reduced economic activity results in less demand for new infrastructure, such as office construction and infrastructure related to tourism, and pipeline ambiguity further dampens investment.

Supply, and the need to have access to the inputs required to deliver infrastructure. In this crisis, we are not only facing a demand shock but also a supply shock as supply chains experience reductions in production and transport delays. Similarly, border closures impact the availability of skilled resources. Smaller businesses tend to have limited access to credit and less cash at hand to support their operations during a downturn.

Outlook for demand over the next five years

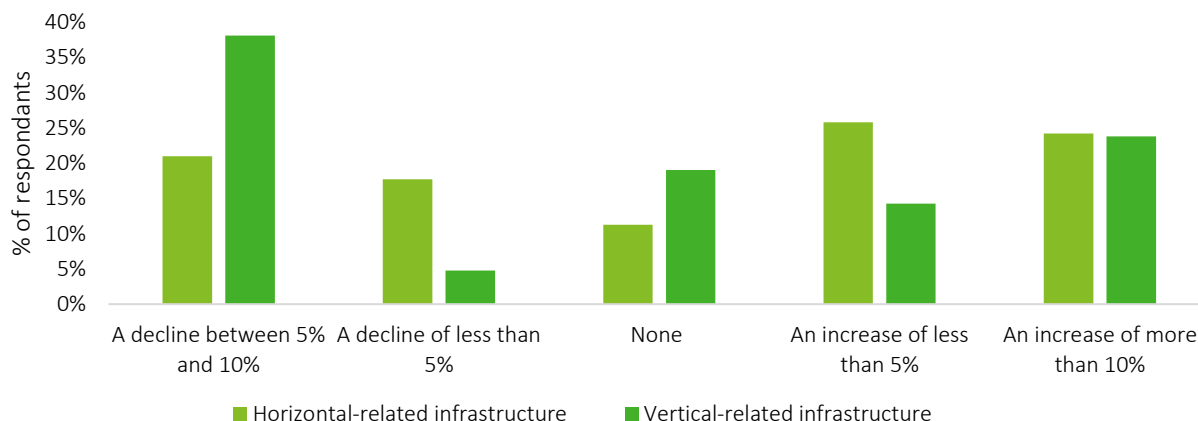
In this section we present an illustrative view of the demand outlook for the Sector over the next five years. Our view has been informed by:

- The Te Waihangā Infrastructure Pipeline
- Government announcements on the New Zealand Upgrade Programme and Shovel Ready initiative
- Interviews with the Ministry of Business, Innovation and Employment and the 2019 National Construction Pipeline Report
- Stakeholder interviews
- COVID-19 Recovery survey responses.

Given the different drivers for horizontal and vertical infrastructure we have looked at these two sub-sectors separately in order to better convey the potential impact of COVID-19 on the forward pipeline of work.

Reported expectations for future business activity over the next one to five years differ between infrastructure-related construction sub-sectors. Vertical sector firms were more pessimistic than horizontal, with 38% of respondents to the C-19 Recovery Survey expecting a decline in business activity of between 5% and 10%.

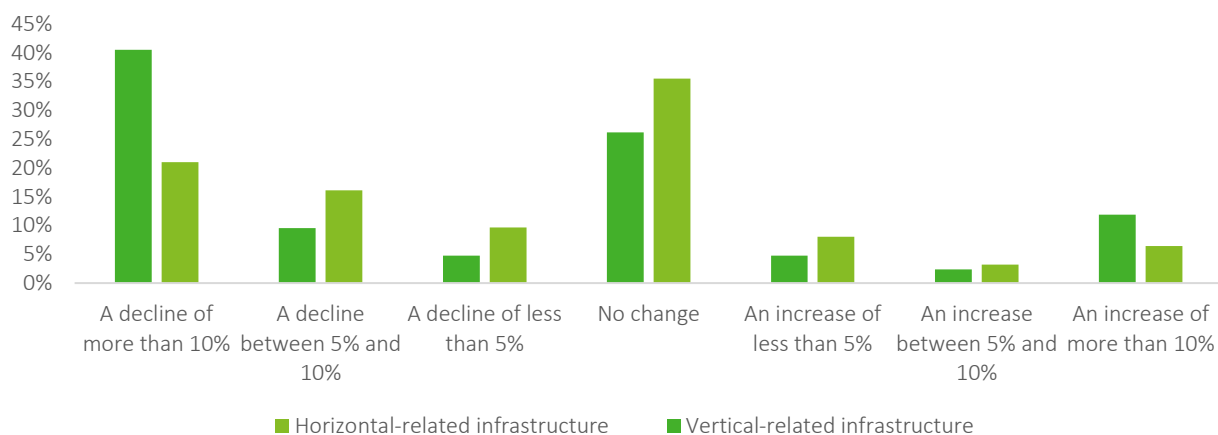
Chart 23 What are your expectations in the change in business activity for your New Zealand operations over the next one to five years?



Source: C-19 Recovery Survey

The effects of COVID-19 and the lockdown are expected to linger into the foreseeable future when considering how firms' view their 12-month forward order book. Firms operating in the vertical sector were more likely to have experienced a decline of more than 5% in their 12-month forward order book compared to those in the horizontal sector (50% vs 37%).

Chart 24 What does the value of your 12-month forward order book look like compared to pre-COVID (March 2020)?



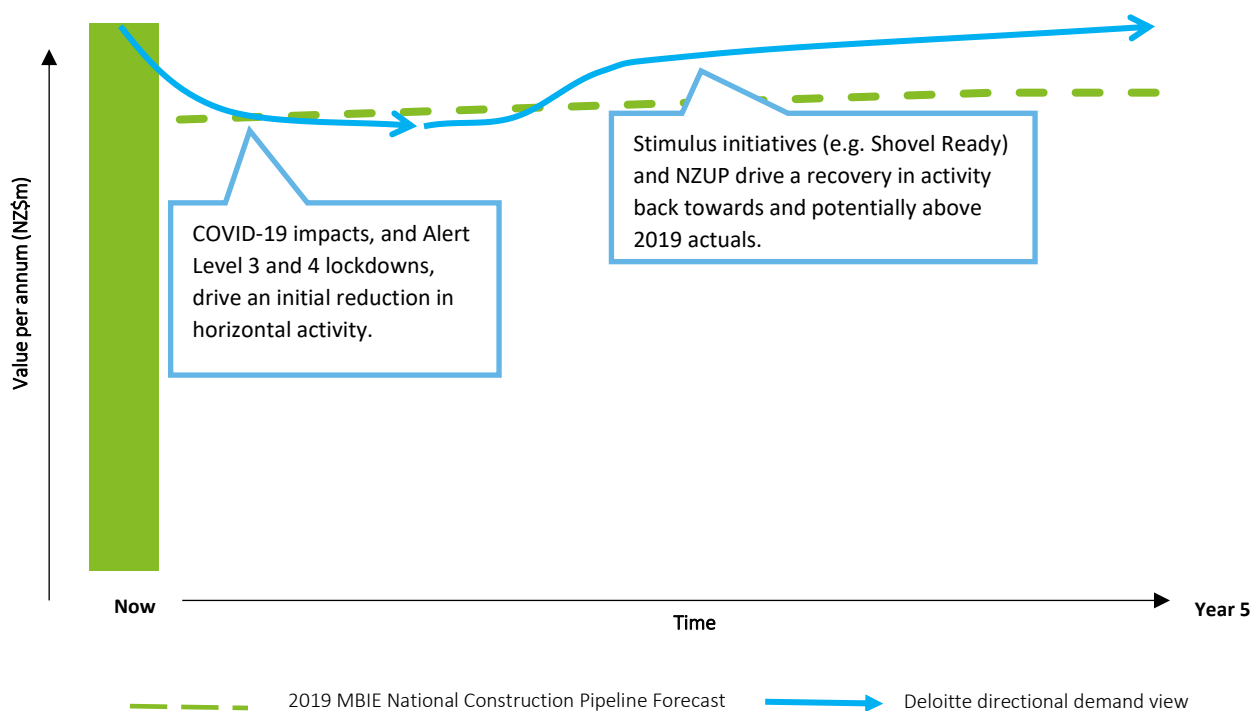
Source: C-19 Recovery Survey

Given the different drivers for horizontal and vertical construction, we have looked at these two sub-sectors separately in order to better convey the potential impact of COVID-19 on the forward pipeline of work.

Horizontal construction

We expect horizontal construction activity to continue to grow at a steady rate over the next five years after an initial drop in 2020 driven by the effects of the Alert Level 3 and 4 lockdowns. The recovery will be underpinned by government stimulatory expenditure. Chart 25 illustrates our directional view of the total pipeline value.

Chart 25 Horizontal demand, 2019 to 2025



Source: Deloitte Analysis

Although NZUP was announced prior to COVID-19, the pipeline of work associated with this programme will be key to mitigating the impact of COVID-19. In the short-term, NZUP will provide work for design, advisory and project management services. The wider Sector will benefit from NZUP associated work in the medium term.

We expect the level of spend in the horizontal sector to exceed the 2019 National Construction Pipeline forecast. Our analysis of the available data on NZUP and Shovel Ready projects suggests that these two programmes may drive total demand above the forecast levels published by MBIE in the 2019 National Construction pipeline forecast, accounting for the COVID-19 impact on demand.

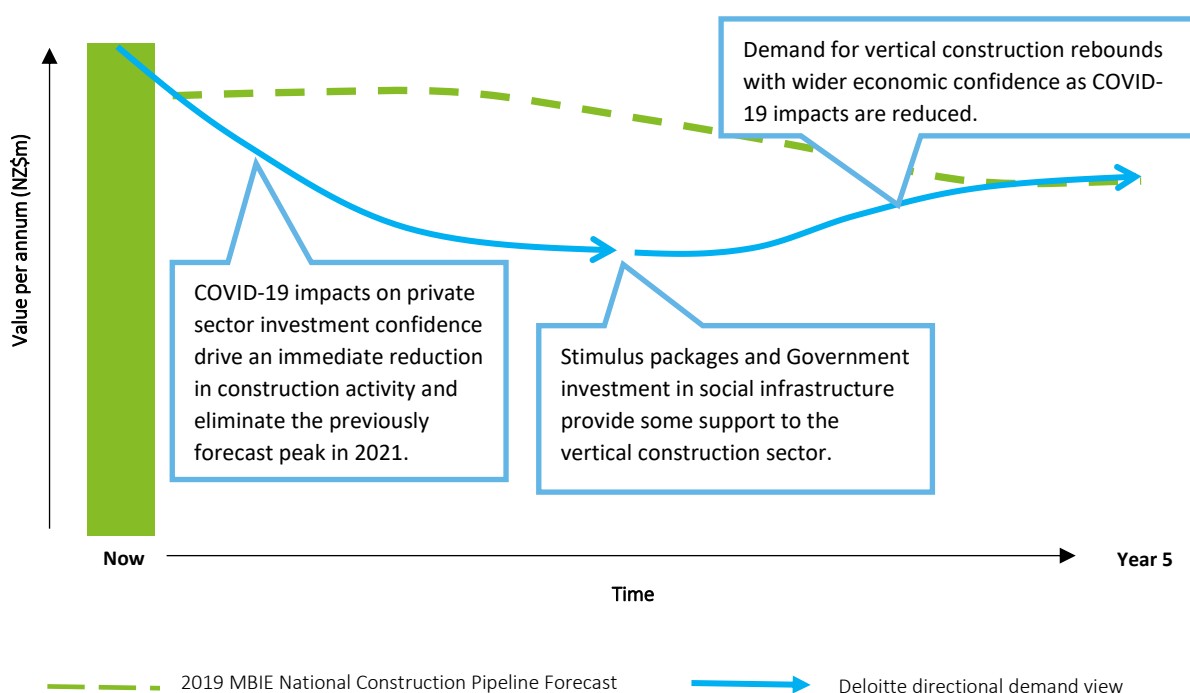
Delivery of this pipeline may be constrained by the Sector's capacity, such as its ability to access required skills and labour, particularly in key sub-sectors that are receiving the bulk of stimulus funding.

Vertical construction

Prior to COVID-19 the outlook for the vertical construction sector was relatively strong. The 2019 MBIE National Construction Pipeline Report indicated a pipeline of projects that would drive activity to a peak of \$9bn in 2021, followed by a steady decline to \$7.2bn in 2024.

The outlook for vertical construction has been impacted more severely by COVID-19, as illustrated in Chart 26. We expect a dramatic drop in activity relative to the 2019 forecast before a recovery back to previously anticipated levels in 2025.

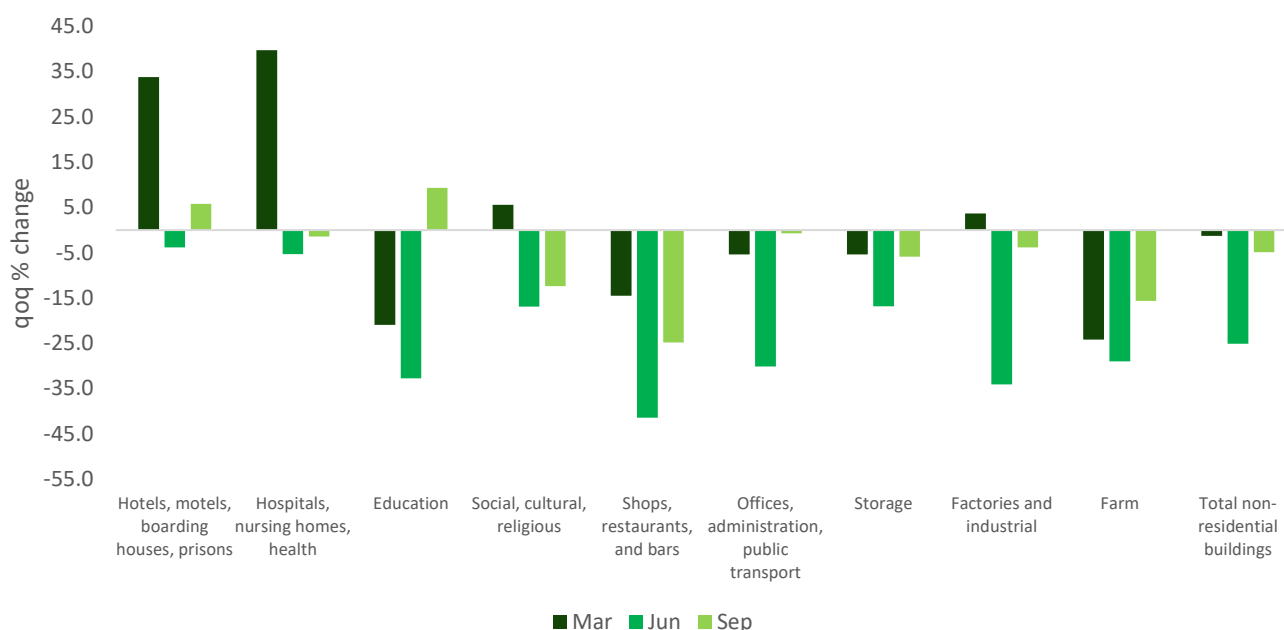
Chart 26 Vertical demand, 2019 to 2025



Source: Deloitte Analysis

The negative outlook for vertical construction is reinforced by building activity in 2020. According to Statistics New Zealand data, building activity for hotels, motels, boarding houses, and prisons lifted by 39% over 2019. Over the same period, commercial building activity increased by 17%, and shops, restaurants and bars increased by 33%. COVID-19 has had an immediate negative impact with each quarter since March 2020, reporting lower values of building activity relative to the same quarter in 2019. The only non-residential building types that showed a positive growth in the September 2020 quarter were education and hotels, motels, boarding houses, and prisons (as shown in Chart 27).

Chart 27 Vertical construction: the value of building activity completed, percentage quarterly change relative to the same period in 2019 (pre-COVID)



Source: Statistics New Zealand

Looking ahead, there will be two key headwinds for vertical construction. Continued nervousness and economic weakness holding back the appetite for large business investment; and the significant impact that international border closures have made to population growth, access to skilled resources and demand for vertical infrastructure in sectors hardest hit by COVID-19. Deloitte estimates that New Zealand's population growth will only be back at pre-COVID levels in 2024 and 2026, mostly due to lost international migration. Stimulus initiatives will provide some support for the vertical construction but are unlikely to make-up the shortfall in demand associated with the cancellation of private sector developments.

Outlook on capacity

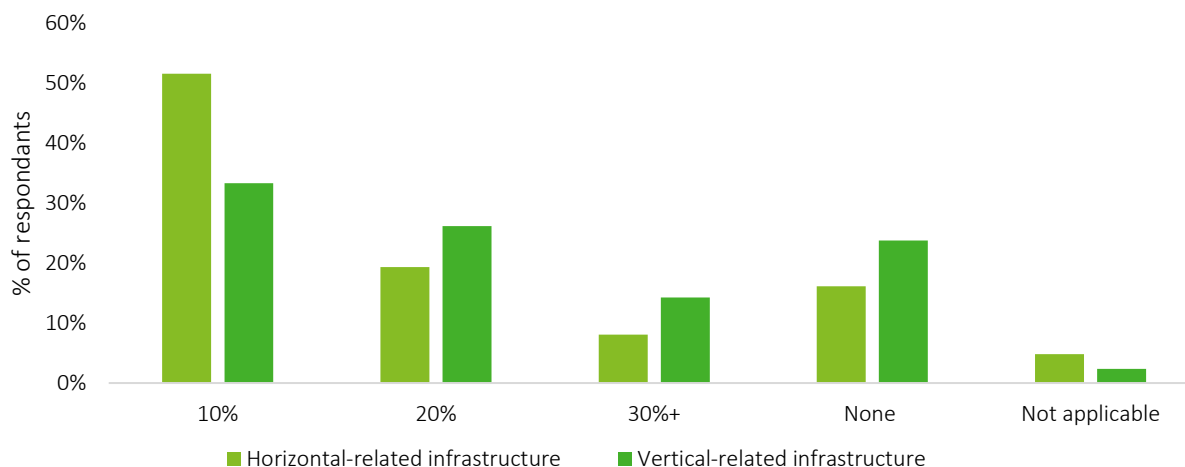
The implications of COVID-19 on the Sector's capacity to deliver differs between the vertical and horizontal sectors – as illustrated above. The demand outlook suggests that the horizontal sector will need to increase capacity, while the vertical sector will likely have excess capacity and will be looking for productive work.

The excess capacity likely to be present in vertical construction presents a risk that capability and capacity could be lost over the coming years, potentially creating a challenge for the Sector in the future.

The actual shortfall or surplus in capacity will ultimately be determined by the number and size of projects that are brought to market, and decisions that firms make around their resource requirements based on the signalled pipeline of work. Additionally, the aggregate view of any shortfall or excess capacity in the Sector will be influenced by the transferability of skills and labour between horizontal and vertical construction. We expect some firms and people will be able to make this transition and follow the work, but that ultimately excess capacity will remain in vertical construction. Transferability is inherently restricted by the specialised nature of some skills, equipment and materials.

Parts of the Sector can respond if there is an increase in the volume of work. Survey responses indicated 52% of horizontal sector and 33% of vertical sector firms can increase capacity by 10% to meet demand if there is an increase in volumes of work; 19% of horizontal sector and 26% of vertical sector firms can increase capacity by 20% to meet demand if there is an increase in volumes of work; only 8% of horizontal sector firms can increase capacity by 30% and 14% of vertical firms.

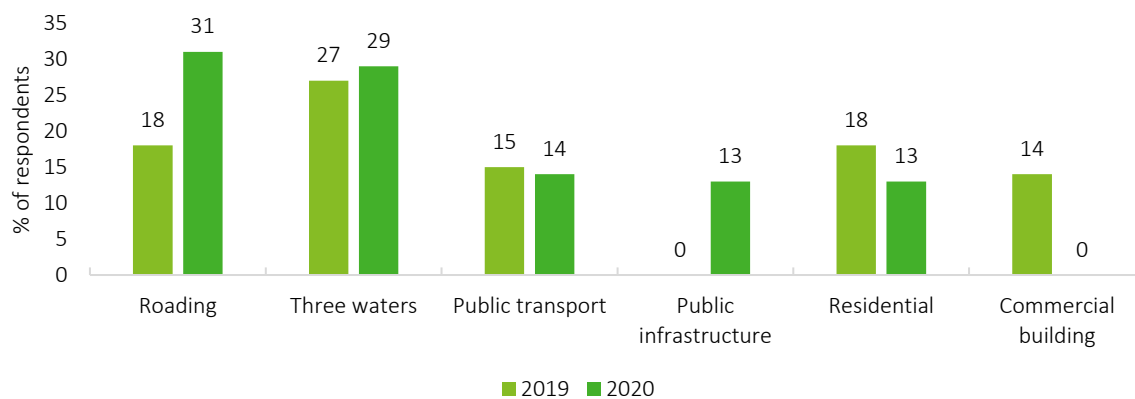
Chart 28 What is your ability to increase capacity to meet the volume of work signalled in the market for infrastructure-related construction in New Zealand?



Source: C-19 Recovery Survey

Furthermore, the capacity outlook will vary by project type. Anecdotal evidence gathered through our interviews suggests that for some project types (e.g. transport) the challenge will not be one of a dwindling pipeline but building the necessary capacity to deliver the signalled pipeline of work. This is supported by the Civil Contractors 2020 Construction Industry Survey where respondents have indicated an increased focus on improving roading capacity in the next 12 months to meet the signalled demand.

Chart 29 Project types for increased capacity in next 12 months



Source: Civil Contractors Construction Industry Survey 2020

However, it takes time to increase capacity. The majority of survey responses indicated it takes 3-12 months to ramp up to meet additional demand. Survey responses referenced pipeline certainty and opening the borders as being the most effective ways enable an increase in supply.

Part B: Challenges and Opportunities

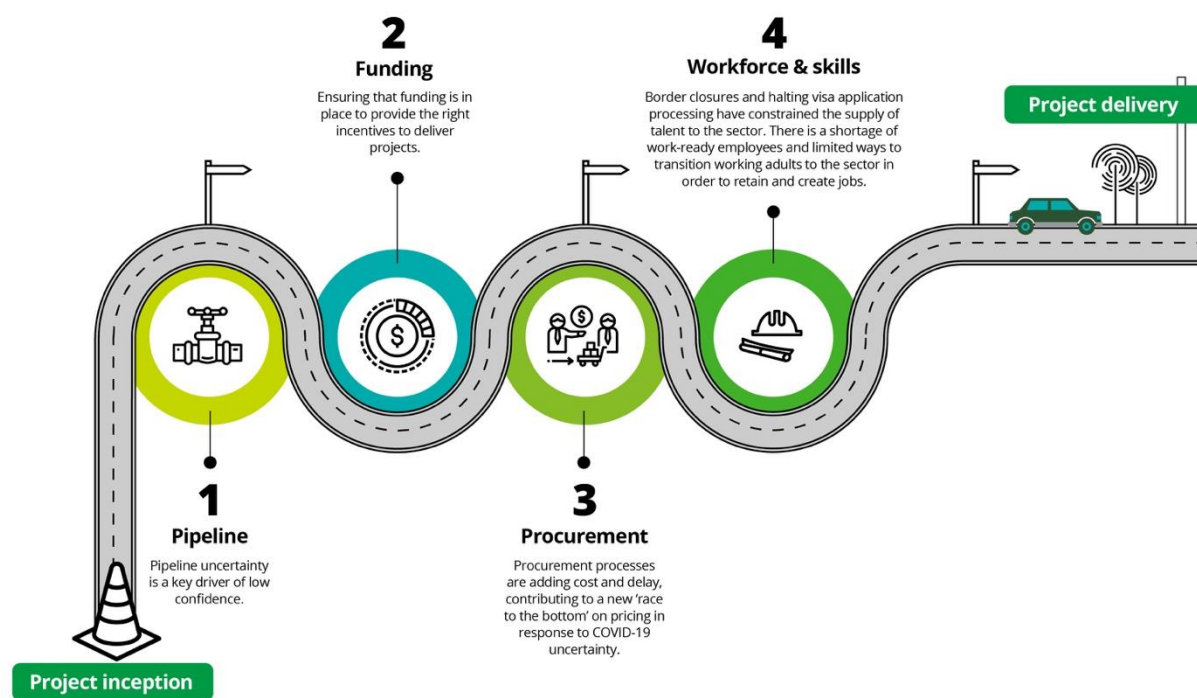


Challenges amplified by COVID-19

The research, survey and interviews conducted as part of this report found COVID-19 amplified existing challenges.

This report distils insights and feedback into four key challenges that could be addressed to maximise the opportunity of infrastructure as a stimulus and secure the long-term recovery of the Sector (see Figure 2).

Figure 2 Key challenges amplified by COVID-19



Note: for the purposes of this report we consider pipeline to refer to the full range of projects that are being considered and progressed, and not solely the Infrastructure Pipeline tool produced by Te Waihangā.

These challenges are interrelated. Establishing a clear, reliable and robust pipeline is a critical element for the Sector's recovery. Other challenges identified need to be addressed in a manner that responds to, and provides support to, the delivery of the pipeline. This will help to ensure projects being taken forward are brought to market efficiently, can be delivered effectively, and ultimately deliver the right outcomes.

Opportunities to address each of the challenges are considered in more detail in the subsequent chapters. For each challenge, this report identifies:

- The issues that existed in the Sector before the pandemic
- How COVID-19 amplified the challenge
- Current initiatives in play to address the challenge
- Key opportunities to address the challenge to support recovery

Opportunity 1:

Pipeline certainty

Pipeline certainty is a key driver of confidence. The pipeline needs to be complete (with an appropriate mix of projects), certain (forecast spend, and timing is accurate) and strategically robust (projects are strategically aligned and represent value for money).

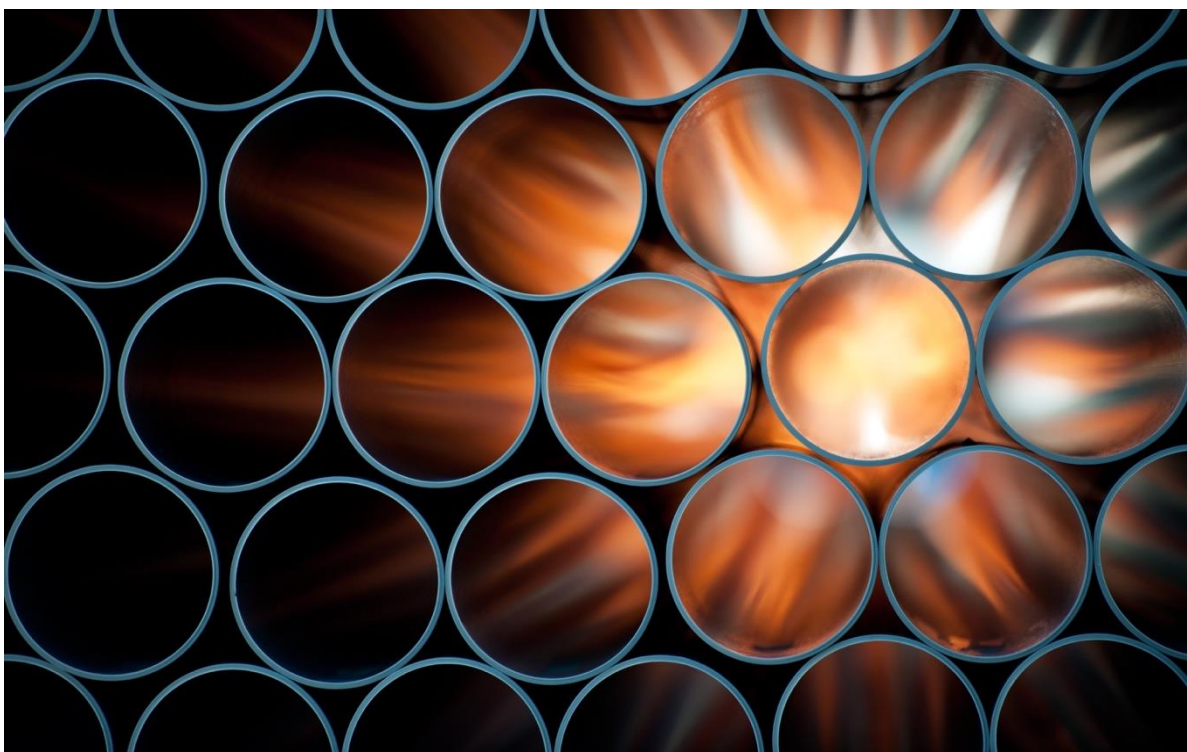
A pipeline of work that is complete and certain will provide the market with the confidence to proceed with investment, generate and secure meaningful employment and business opportunities, and allow employers to better plan their resource requirements, particularly during the recovery phase.

Challenges prior to COVID-19

The pipeline challenges prevalent in the Sector have been identified and discussed in previous studies and reports with a focus on:

Tendencies for signaled projects/activity to be delayed. The Sector has acknowledged that signaled intentions do not always eventuate and there is an opportunity cost to this if market participants are waiting for opportunities to tender for or undertake work.

Related to the above, the influence of the electoral cycle on the direction of infrastructure activity, particularly for flagship projects. Policy shocks driven by electoral cycles that lead to changes in strategic direction make it hard to plan adequately for the future. Building skills and resources takes time and a consistent pipeline of work is required to support this.



A lack of a ‘single source of the truth’ for market activity. Information and forecasts around the pipeline of work are currently disaggregated across public sector purchasing entities, private sector developers, and those organisations that invest significant time researching and forecasting activity (e.g. BRANZ, Pacifecon, MBIE). A ‘single source of the truth’ is needed.

The Government has responded to the need for a clear and certain pipeline through the establishment of Te Waihangā and its role as a ‘shop front’ for the market. To fulfil this role Te Waihangā has built the Infrastructure Pipeline tool which collates information on infrastructure projects from a range of public sector bodies. This tool continues to mature, with the number of contributors and projects growing with each iteration. The organisations interviewed as part of this report were consistent in their views that the Infrastructure Pipeline is a valuable tool and encouraged Te Waihangā to continue its development.

Similarly, Te Waihangā has a remit to develop a 30-year infrastructure strategy to provide consistent direction for infrastructure activity to allow the Sector to invest in the skills and resources that are required over the longer term.

Other activity is underway to consider **how project selection into the pipeline can be improved**, and **how those selected projects can be brought to the market faster**. Initiatives include RMA reform and the Construction Sector Accord’s Rapid Mobilisation Playbook, the COVID-19 Recovery (Fast-track Consenting) Act and the Shovel-Ready programme. Te Waihangā has also noted it is working with the Treasury to investigate potential reforms to the Investment Management System to improve the robustness of project selection and prioritisation.

How COVID-19 amplified these challenges

One of the greatest concerns many survey respondents shared was the disruption of forward work and the associated uncertainty in the longer-term pipeline. In our C-19 Recovery Survey, close to three quarters of businesses reported projects had stalled as a result of COVID-19.

While the Sector had started the year with a strong pipeline of work, projects were being cancelled or delayed.

The disruption to vertical sector businesses was the most severe as the Alert Level Four Lockdown during Q2 restricted privately funded construction activity. Among respondents to the C-19 Recovery Survey, 79% of firms in the vertical sector reported projects that had been delayed as a result of COVID-19. Vertical sector construction projects have been the first to be delayed or cancelled, reflecting a significant proportion of vertical sector construction activity is driven by the private sector. As at December 2020, structural steel contractors indicated that 8.4% of the sector’s annual volume is expected to be delayed or deferred in 2021.¹⁰

Multiple firms reported clients which had tendered or negotiated projects in the vertical sector which now had delayed start dates. Tourism related projects and green field development projects were also referenced frequently by respondents as being delayed or put on hold. Major projects delayed included the Auckland Airport redevelopment, hotels, and university redevelopments.

A similar view can be seen from a survey undertaken by The Property Council of New Zealand, which aimed to obtain some general high-level information relating to private sector projects in the development pipeline¹¹. 70% of the 55 commercial/industrial projects surveyed were rendered uncertain due to the events of COVID-19 as at 9th May 2020.

In contrast, **uncertainty across the horizontal sector was not as severe**. This was in part due to the increase in government investment along with the longer lead times typical of large infrastructure projects.

However, it was noted by peak bodies that projects sponsored by the local government sector were a major source of uncertainty in the short term.

¹⁰ Steel Construction New Zealand (December 2020), Industry Update

¹¹ Property Council New Zealand (May 2020), Development Pipeline Survey Memo

The effect of COVID-19 has also varied across the project lifecycle. This is echoed in a survey undertaken by Civil Contractors New Zealand.¹² Of the 188 respondents, 19% had contracts either cancelled or deferred as at June 2020. Sub-constructors felt the immediate brunt of the Alert Level Four Lockdown through cash-flow consequences. Professional service providers (architects, engineers, project managers etc.) were able to keep working during the lockdown period but are now indicating their order books beyond 2020 are looking leaner. Across the Tasman, 431 members of the Australian Institute of Architects participated in a survey to determine the impact of COVID-19 on the profession.¹³ Of those respondents, 44% of firms indicated they had 3-6 months of work in their pipeline.

Opportunities in addressing this challenge

Although pipeline certainty and visibility are not new concerns, COVID-19 has made the value of a certain and complete pipeline even greater. Having seen out the initial Alert Level Four Lockdown and the subsequent Alert Level Three Lockdown in Auckland, the market is now turning its focus to 2021. 'Shovel ready' projects and other stimulus initiatives have been well received; however, to build confidence in the Sector, and support the retention of jobs, greater certainty is required around when and how these projects will come to market.

Our observations are that to support recovery, and address the pipeline themes identified above, the Sector should focus on:

Improving the robustness of project selection. Identifying opportunities to improve the robustness of project selection and funding will help to ensure business cases remain viable throughout the project lifecycle.

Ensuring the pipeline addresses all stages of the project lifecycle and all sub-sectors. Although 'Shovel Ready Projects' and other initiatives are extremely valuable, the pipeline needs to be replenished with new projects and ideas that are in the earlier stages of development (for example the New Zealand Upgrade Programme). Similarly, although some skills are transferable between sub-sectors, the pipeline of work needs to be maintained for all trades and skills.

Achieving appropriate project mix (size, complexity, location). Monitoring and augmenting the mix of projects coming to market across all sub-sectors will help to ensure firms of different sizes, location and skillsets have a pipeline of work that they can access and compete for.

Collaboration across purchasing/delivery agencies. A complete and transparent pipeline not only helps suppliers to plan more robustly it also provides an opportunity for delivery agencies to collaborate. This collaboration could identify ways to deliver project/programme benefits faster or enhance existing benefits.

Identify and progress projects that support the widest range of firms. Greater communication and collaboration between public and private sectors will ensure prioritised projects touch all stages of the project lifecycle and all tiers of providers.

¹² Civil Contractors New Zealand & Telectrac Navman (2020), Construction Industry Survey

¹³ Australian Institute of Architects (2020), National COVID-19 Member Results, Impacts and Next Steps

Opportunity 2:

Local government funding

Local authorities are key spenders on infrastructure, however funding challenges are driving reductions or deferrals in expenditure.

Challenges before COVID-19

The Productivity Commission's *Local government funding and financing* report identified a number of specific funding challenges relating to infrastructure including:

Maintaining services in areas with declining populations. Authorities with declining populations may struggle to meet fixed costs previously serviced by a larger population and rate payer base.

Higher asset performance is required to meet environmental and public health standards. Meeting increased regulatory requirements and greater public expectations around water quality will require higher expenditure on asset maintenance and upgrades.

Replacing existing infrastructure coming to the end of its useful life. Assets at the end of their useful lives will require significant capital expense which needs to be funded.

How COVID-19 amplified the challenges

Many local authorities were impacted by a fall in revenue as a result of the economic downturn. These additional funding uncertainties and constraints have been cited by the market as contributing to delays or cancellations in projects and/or maintenance activities.

Local government is responsible for approximately half of all public infrastructure¹⁴, yet funding is a major constraint for these organisations with many councils nearing their debt ceilings.¹⁵ These funding constraints are a key factor in driving the documented infrastructure deficit in New Zealand¹⁶ and interviewees noted that in some cases local authorities lack the budget to complete condition assessments on their assets, let alone undertake the necessary maintenance.

¹⁴ The New Zealand Treasury (2016), [Ten Year Capital Intentions Plan 2016](#)

¹⁵ Department of Internal Affairs (March 2020), [COVID-19 Financial Implications Report 2- Alert Level Scenarios, Assumptions and Updated Analysis](#)

¹⁶ Association of Consulting and Engineering and Sense Partners (September 2020), [Infrastructure for the long haul](#)

Opportunities in addressing this challenge

Funding and financing mechanisms: The need to address local government funding constraints was recognised consistently by interviewees. In a constrained environment, available funds either need to be used more judiciously to ensure maximum benefit, or alternative sources of funding need to be sought. The Infrastructure Funding and Financing Bill Act 2000 provides councils with a new funding tool to levy the beneficiaries of infrastructure. There are also international examples New Zealand could consider. In Greater Manchester, for example, the city was able to ‘earn back’ portions of increased VAT or GST, generated as a result of city rejuvenation through infrastructure investment and use these cashflows to fund additional infrastructure projects¹⁷.

Asset management. Local authorities could look to improve their asset management capability utilising the available funds in the most astute manner. A strategic view of asset management will help local authorities to target available funds where they will have the biggest impact and will help to build the resilience of critical assets.

Figure 3 Strategic Asset Management



Source: Deloitte analysis

Maintenance activities. Peak bodies also consistently recognised the important role maintenance activities could play in the recovery from COVID-19. Maintenance activities are lower in value and are generally less complex, and as a result can provide a greater stimulatory effect through the speed at which they can be brought to market and the wider range of firms capable of delivering them. The longer-term benefit is if maintenance activities are carried out appropriately, it can extend the life and performance of infrastructure already in place.

¹⁷Gov.uk (2012), [City Deal: Greater Manchester](#)

Opportunity 3:

Improve procurement

Procurement processes can add cost and delay and may contribute to a 'race to the bottom' in response to COVID-19 uncertainty.

Challenges before COVID-19

Existing challenges with procurement processes have been well documented. The 2018 Entwine report¹⁸ identified several key concerns and these have been echoed through peak body interviews undertaken as part of this report. Key issues include:

Selecting based on price. Purchasing entities do not always appropriately consider value for money and often purchase on a lowest price basis rather than best value basis. The impact is to drive down prices as tenderers seek to submit aggressively priced and lower margin proposals, leading to firms taking on more risk.

Procurement processes. Processes have been cited as inefficient with non-value adding activities, wasted effort, and the need to become familiar with a range of different processes or forms, driving up compliance and tendering costs. Similarly, poorly planned or timed procurements may not generate the best value for money responses, if response times are too tight or the market does not understand the end-to-end procurement strategy.

Risk allocation. Risk is not always well understood and therefore the contracting and procurement processes do not always allocate risks to the party best positioned to manage them. Similarly, bespoke risk allocations require extensive effort to establish, assess and price.

The Sector is already investigating and progressing activity to transform procurement and address some of these long-standing issues. Key initiatives we are aware of include:

- 'Procurement and Risk' is a key area of action in the Construction Sector Accord's Transformation Plan. It is seeking to build procurement skills, promote clearer contracts and improve outcomes for subcontractors.
- The importance of a value-based/whole-of-life cost approach to procurement is recognised by the Government and is promoted by the Treasury and MBIE guidelines.
- Te Waihangā has noted it is working on providing further guidance to the Sector around the use of more collaborative models (i.e. Early Contractor Involvement).

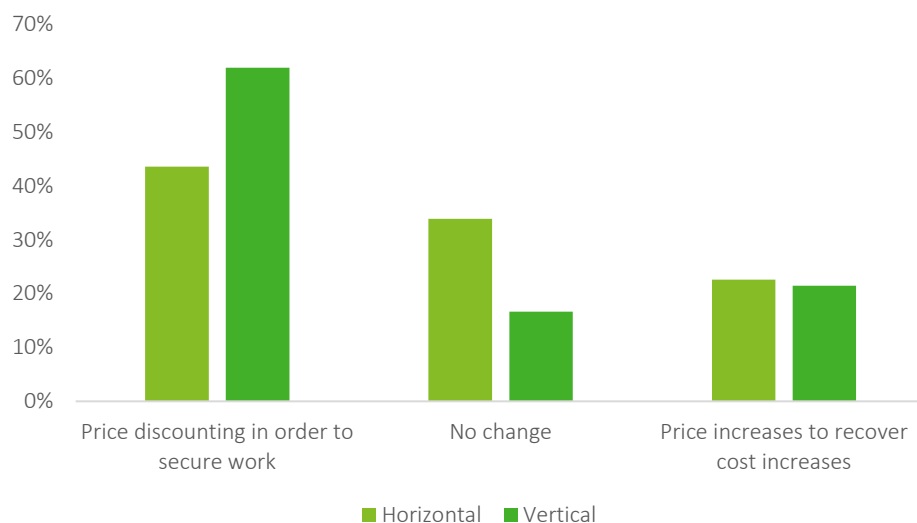
How COVID-19 amplified the challenges

In the eyes of interviewees, COVID-19 has amplified the existing procurement challenges and made them more pressing. It was noted **that firms' margins are being eroded as they try to keep staff busy by winning work at lower price points.**

Fifty percent of C-19 Recovery Survey respondents indicated they have seen price discounting as a result of COVID-19. A greater proportion of vertical sector firms expected price discounting to secure work (62% of respondents) compared to horizontal firms (44% of respondents).

¹⁸ Entwine (August 2018), Creating value through Procurement: A report into Public Sector Procurement of Major Infrastructure Projects

Chart 30 What are the potential impacts you see on pricing strategies in the COVID-19 environment in New Zealand (relative to pre COVID-19)?



Source: C-19 Recovery Survey

Peak bodies indicated cancellations or delays in projects have resulted in previously busy staff members now having capacity, and firms are seeking to cover their costs and retain staff until the signalled pipeline of work reaches the market. This view is also consistent with the perception of underbidding revealed by the C-19 Recovery Survey rather than increased price competitiveness.

RICs NZ has noticed over the past two years **risk in the Sector is generally passed to sub-contractors** rather than retained by head contractors. Evidence collected during this report suggests head contractors' margins are tighter than they were pre-COVID-19 but that sub-contractors have seen even greater tightening. For example, the majority of respondents showed margins for head contractors were down 1 to 2% while subcontractor margins were down by 5 to 10%.

Opportunities in addressing this challenge

Our observations from the interviews, surveys and research indicate the Sector would see the following as aiding recovery:

Consistent and expedited procurement processes to help reduce costs and get work to market faster.

Compliance costs associated with procurement could be reduced if procurement processes were aligned across regions. It has also been noted that procurement processes need to be expedited to help contracts get to market sooner.

Increased use of collaborative models. Collaborative or longer-term relationship-based procurement models are being seen by the Sector as more attractive, due to their ability to lower repeated costs associated with tendering for work. Supplier panels potentially allow greater flexibility around how work is distributed; however, care needs to be taken to ensure companies on these panels still have access to a sustainable pipeline of work, that panels remain open to new suppliers, and that smaller suppliers are not shut-out.

Providing clear and robust plans to procure the work. These will give the Sector greater clarity and confidence in project schedules and provide the lead time necessary to secure or retain appropriate skills and resources.

Package programmes and projects appropriately. Contracts brought to market should consider the capacity and capability of the private sector to deliver at that point in time.

Consider the ongoing impact of COVID-19 when allocating risks. COVID-19 continues to pose a time and cost risk and purchasing entities should consider how these related risks can be allocated in a balanced way.

Opportunity 4:

Workforce and skills

Border closures are constraining access to talent that was already in demand. There is a shortage of work-ready employees and limited ways to transition working adults to the Sector in order to retain jobs.

Challenge before COVID-19

Infrastructure-related construction is not a special case – many other sectors, including agriculture and horticulture, rely on overseas skills and talent to meet demand. The shortage of people and skills throughout the Sector has been recognised previously with forecasts by MBIE in 2017 indicating that the Sector needed to increase the numbers of plumbers, electricians and civil engineers by greater than 12% by 2022 to keep up with demand.¹⁹

Key challenges associated with workforce have been cited as including:

The range of skills needed are not home-grown, nor in abundant supply. Specialised expertise in civil, water, rail, structural engineering, and project management – particularly in vertical infrastructure – are in demand. Some areas of infrastructure expertise, like tunnelling, are almost entirely sourced from overseas.

The country's immigration and visa processing systems can be time-consuming and opaque when seeking to obtain border exemptions. Border exemption processes for critical workers have been cited by peak bodies as being unclear and challenging to navigate.

Developing people with the right knowledge and skills takes time. Many skills involved in the delivery of infrastructure cannot be developed quickly. In many cases a combination of education and on-the-job training is required before a worker can become truly productive.

Simply put – without the right mix of skills and people, the ability to deliver the infrastructure pipeline and unlock significant domestic employment opportunities appears fragile.

How has COVID-19 amplified this challenge

It is clear from talking to peak bodies and survey respondents that, with the overseas workforce drying up, local firms are finding it increasingly difficult to source the right people.

Existing skills shortages have been amplified through COVID-19, although sub-sectors have been impacted differently. The migration of some workers prior to the Alert Level Four lockdown has impacted large horizontal infrastructure projects and although systems are in place to allow essential skills into the country, the ongoing border restrictions are a hurdle. There is also a concern that in the medium-term existing labour and skills could be lost overseas if they are not provided with a steady stream of work in New Zealand. We understand that Te Waihangā is working with other agencies to help address the challenges that border restrictions are creating for the Sector.

¹⁹ MBIE (July 2017), Future demand for construction workers

Access to and hiring skilled workers is a significant barrier to recovery. Close to half of respondents were having difficulty accessing specialist skills. The most in-demand skillsets included engineers, project managers and three waters engineers.

Finding skilled workers is a common theme across other recent sector surveys. Te Waihangā Asset Owners Survey indicated that capacity and capability has resulted in an inability to deliver works programmes on time and on budget and that good talent is moving to the highest bidder (thereby impacting smaller contractors negatively). A quarter of respondents to the CCNZ Construction Industry Survey, conducted between 8 and 28 June 2020, chose skills shortages as the main industry challenge and 69% would hire today if the right skills were available.

There is a ready supply of potential labour within the market as a result of redundancies in other sectors, however, a mechanism is required to support the transition of these workers to infrastructure construction by quickly upskilling them. New Zealand was one of the first countries in the world to recognise 'micro qualifications' and the COVID-19 environment is a chance to put the concept to good use. Some roles or qualifications, like civil engineering, are unlikely to be suited to a micro qualification – but others might be. Related sectors, like freight logistics, are already rolling out NZQA-endorsed micro qualifications to alleviate workforce shortages. The Road Transport Forum, with the backing of an industry governance group, has created a training programme, *Te ara ki tua Road to Success*, that meshes together on-the-job practical training with theoretical components leading to qualifications and employment in the industry.

The demand for such skills is not limited to New Zealand. Investing in infrastructure to stimulate economies during recession is not unique to New Zealand and that means other countries, like the United Kingdom, Canada and Australia are competing for the same talent – as are a range of other countries.



Opportunities in addressing this challenge

Our observations indicate that the recovery of the Sector could be supported through:

Streamlining and clarifying border exemptions. Making the border exemption process easier and providing greater support to applicant firms could help alleviate challenges around access to foreign skills.

Targeted micro-courses aimed at transitioning workers into infrastructure-related construction. Removing hurdles and making the transition from other sectors, or even other countries, to an infrastructure-related construction-based career will help to attract and deliver employees that are 'work ready'.

Appendix A: Interviews

Interviews were conducted with representatives from industry peak bodies. The insights received are summarised below into key themes. Insights received from the interviews were instrumental in informing our findings presented in this report.

Pipeline

Projects need to reach the market faster. Firms expect to cut staff and costs as they wait for projects to come to market.

COVID-19 has amplified or accelerated existing issues rather than creating new ones. There have been existing issues around the visibility of local government pipeline and confidence about when these works will come to market, in addition to timeframes associated with RMA and Building Consent approvals.

The impact of COVID-19 on firms across the infrastructure construction sector supply chain cascades across the project lifecycle. There was an immediate cash flow impact on constructors during 'lockdown', however, others were able to keep working remotely. Architects, engineers and others involved earlier in the lifecycle are now noticing the impact of stalled projects, while contractors can keep working on projects already underway.

The impact differs for firms in the horizontal and vertical segments of the market. With the majority of work in the vertical segment associated with private developers (c.80% according to interviewees), the companies working to service this segment are feeling the freeze/delay in projects earlier than those working in the horizontal segment, where work is typically publicly funded.

There is strong support for further development of the infrastructure pipeline. Te Waihangā's pipeline is a helpful tool and should continue to be augmented with the widest range of project types and sizes possible, particularly from local government. A greater range of project types and sizes could make the tool even more valuable and provide a clearer understanding of pipeline.

Indications are that existing projects/contracts will keep companies occupied in 2020 but there is more anxiety around workloads in 2021 and beyond. Firms are comfortable with their prospective workloads for the remainder of the year, as they work through contracts that were committed prior to COVID-19. Where firms are most concerned is the pipeline of work starting in 2021.

Firms are confident they can meet demand if there is certainty around when projects in the pipeline will come to market. The general consensus across all firms is that they will be able to meet the demand that is signalled to the market – provided that they are given sufficient clarity around timing of projects so they can retain staff and/or scale-up.

Funding and financing

Funding challenges are driving reductions or deferrals in Local Government expenditure. Further, firms are struggling with diminished cash flow.

There is lack of fiscal headroom for Local Government. Some councils have reached their debt ceilings. COVID-19 exacerbated this issue as there was a drop in revenue from some user-paid revenue streams. Local government entities have a large number of projects but limited available funding and there are challenges to raising additional funds. Peak bodies have identified unsustainable funding models as a systemic barrier for local councils. In some instances, councils do not have the funds to conduct assessments of assets, let alone maintenance works. Existing funding mechanisms (i.e. rates) cannot be easily targeted.

Cash flow impacts for smaller suppliers are unclear and may impact their financial viability. Although many public sector entities are now paying suppliers on an expedited timeline, it's unclear whether these payments to head contractors are filtering down to subcontractors.

Increased maintenance/renewal spend in both horizontal and vertical infrastructure is an opportunity. Maintenance and renewal work in horizontal and vertical infrastructure have been identified as an opportunity to support the recovery from COVID. However, the financial position of many local government bodies means that maintenance activity is being deferred.

Procurement

The current procurement process adds unnecessary costs and delay during a crisis.

Firms' margins are being eroded as they try to keep staff busy by winning work at lower price points. Firms are under significant downward cost pressure. Firms are enacting measures that will enable them to retain their workforce – this is likely to be a significant motivator behind this margin erosion. COVID-19 has exacerbated an issue that already existed.

Value for money has often been equated to lowest cost. Some feedback suggests that an interpretation of value for money as lowest cost has led to purchasing entities putting pressure on suppliers to lower their prices, further exacerbating downward cost pressure and underbidding issues.

Consistent and expedited procurement processes will help to reduce costs and get work to the market faster. Compliance costs associated with procurement could be reduced if procurement processes were aligned across regions. It has also been noted that procurement processes need to be expedited to help contracts get to the market sooner.

Collaborative models are more attractive in the current climate. Collaborative or longer-term relationship-based procurement models are being seen by the market as more attractive, due to their ability to lower repeated costs associated with tendering for work. Supplier panels or similar models potentially allow greater flexibility around how work is distributed. Wellington Water was cited as a good example by some interviewees.

Resources, workforce and skills

COVID-19 has amplified challenges associated with accessing scarce labour. While access to resources and materials is largely unaffected.

COVID-19 has amplified challenges associated with accessing the necessary skills and labour. The availability of specialist skills required for larger infrastructure projects (e.g. Transmission Gully) has been limited by pre-lockdown repatriation. Roles with historic shortages have seen their issues exacerbated by COVID-19 e.g. truck drivers. Specialised expertise is missing entirely from the domestic pool in disciplines where projects happen infrequently e.g. tunnelling. Border restrictions associated with COVID-19 are limiting access to these specialist skills.

There are varying opinions about the impact that COVID-19 is having on supply chain security. Some have noted that an inability to travel overseas to trade shows will impact the supply of heavy machinery, equipment and materials for construction purposes. Others have noted that they aren't seeing this impact, and that any issues are pre-existing (e.g. aggregate availability).

Working with the education sector to develop better skills-based programmes. The Sector is calling for changes to vocational education, and a greater emphasis on skills as opposed to qualifications.

Interview questions are provided below.

Table A.1: Interview questions

1	Impact	<p>What were the immediate impacts of COVID on the pipeline of work and/or live projects? (e.g. revenue, employment, productivity) Please quantify where possible.</p> <ul style="list-style-type: none"> Did the impacts differ between private and public sectors, and across the sectors within your area of market participation? How has this impact changed, or are you expecting it to change, over time? (i.e. during Q2, Q3, and beyond) Has the impact on your members varied through the different COVID-19 Alert Levels? If so, how? Do you have any datasets gathered through surveys or other methods that could help us understand the impact of COVID-19 and are you able to share this data?
2	Impact	<p>What has been the level of uptake for the wage subsidy or small business cashflow loan scheme within the membership?</p> <ul style="list-style-type: none"> For those who have taken them up, how have they helped your members? Are there concerns about the impact of the cessation of the wage subsidy?
3	Demand	<p>What challenges existed around the pipeline of work prior to COVID?</p> <ul style="list-style-type: none"> Was there an appropriate mix of project types and sizes to support wider participation? Has COVID changed, reduced in significance, amplified or masked those challenges?
4	Demand	<p>A key initiative of Government has been to accelerate the approval of funding for certain infrastructure projects (e.g. NZUP, Shovel Ready Projects etc.) – do you have confidence in the ability of these initiatives to help support the sector in the immediate future and stimulate it to recover from COVID?</p> <ul style="list-style-type: none"> If not, why not? What would create a greater degree of comfort/confidence?
5	Demand	<p>Are you and your members familiar with the New Zealand Infrastructure Commission's pipeline?</p> <ul style="list-style-type: none"> Does it capture the information you and your members need to support decision making?
6	Demand	<p>What are members' views around the project pipeline, including initiatives like the New Zealand Upgrade Programme (NZUP) and Shovel Ready Projects?</p> <ul style="list-style-type: none"> Are things coming to market fast enough and is there an appropriate mix of projects (e.g. size, sector, complexity, lifecycle stage)? Are there any road blocks that could slow or limit the ability of the pipeline to support recovery? If so, what are they? (i.e. are there particular things that may reduce the desired impact of initiatives like NZUP, Shovel Ready Projects?)
7	Supply	<p>What are members' views around the project pipeline, including initiatives like the New Zealand Upgrade Programme (NZUP) and Shovel Ready Projects?</p> <ul style="list-style-type: none"> Are things coming to market fast enough and is there an appropriate mix of projects (e.g. size, sector, complexity, lifecycle stage)? Are there any road blocks that could slow or limit the ability of the pipeline to support recovery? If so, what are they? (i.e. are there particular things that may reduce the desired impact of initiatives like NZUP, Shovel Ready Projects?)
8	Supply	<p>Do you have concerns about the ability of the sector and your membership to meet the volume of work signalled in the market? What are the key barriers to delivering on the volume of work that is being signalled?</p> <ul style="list-style-type: none"> Does the supply chain have the right mix of skills to meet the forecast demand? What are the required skills? How does COVID-19 impact access to skills? Can the supply chain access the materials necessary to deliver the pipeline without driving up cost through competition for access? What is the impact on cost?
9	Supply	<p>What is your organisation's/members' ability to respond (increase capacity/utilisation of latent capacity) to a signalled increase in market demand in the current environment? E.g. would you be able to increase capacity by 5%, 10%, other?</p> <ul style="list-style-type: none"> What would enable this response? (e.g. shifting capacity between sub-sectors such as residential construction to infrastructure-related construction) How long would this take?

		<ul style="list-style-type: none"> • Would your ability to respond in the current environment differ to that which was possible before COVID-19? How so? • Assuming we are living in an unconstrained world, what is your ability to increase capacity?
10	Supply	Are there opportunities to increase supply through increased collaboration between firms? Are there any constraints that prevent this from happening?
11	Supply	Are there interventions that could encourage and support firms to invest in increased capacity?
12	Supply	What are the potential impacts you or your membership see on pricing strategies in the COVID environment (relative to pre-COVID)? What are the implications of these pricing strategies?
13	Health and Safety	What impact are the revised health and safety requirements, associated with COVID management, having on delivery and productivity? (e.g. increased cost, slower delivery)
14	Health and Safety	Are there ways in which these impacts and challenges associated with Health and Safety could be alleviated or mitigated? (e.g. technology solutions)
15	Challenges and opportunities	<p>Are there technological advancements relevant to your sector/sub-sector that could be exploited to assist in the recovery from COVID?</p> <ul style="list-style-type: none"> • What impact would these technological advancements have on your sector in the short, medium and long term? • What impact would these technological advancements have on project delivery?
16	Challenges and opportunities	Are there opportunities to use the recovery from COVID, and the current pipeline of infrastructure spend, to address other challenges and commitments, and future proof the infrastructure construction sector? For example: meeting carbon reduction targets, mitigating the impacts of climate change, improving the regulatory environment, improving asset management/maintenance capability.
17	Sentiment	What is the sentiment of your organisation/membership around the current economic climate and recovery from COVID impacts?
18	Policy Interventions	Are there particular solutions or interventions that would support and/or accelerate recovery of infrastructure-related construction sector from COVID-19 which are not currently being pursued by Government?
19	Other	<p>In addition to the interviews with peak bodies, the Infrastructure Commission is planning to undertake a survey of firms operating in the sector. As an input to the design of this survey, have you identified any gaps in the information/data you hold about your members that could provide meaningful insight for this study?</p> <p>(Noting that the Infrastructure Commission is seeking to minimise any overlap with surveys that have already been undertaken by sector participants)</p>
20	Other	Any other comments?

Appendix B: Survey Questions

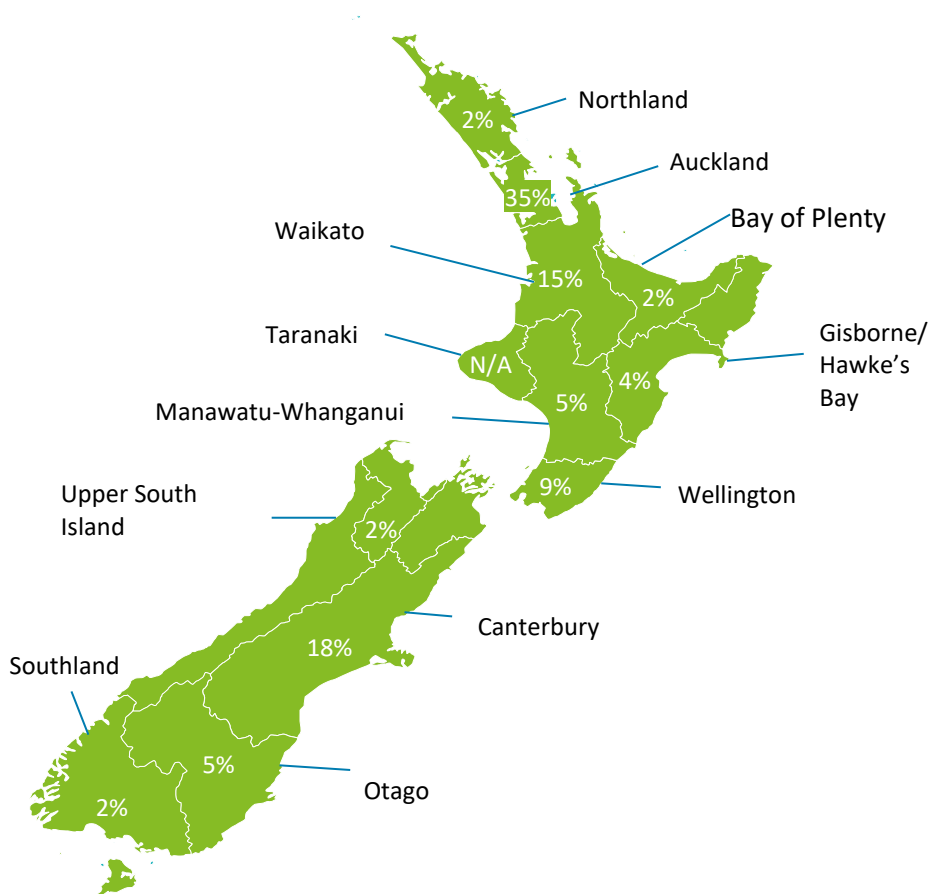
Overview

A survey was conducted of the infrastructure-related construction sector, with a view to identifying impacts and key challenges of COVID-19 on the Sector and identifying opportunities to accelerate recovery from COVID-19. Organisations were asked to distribute the survey to parties that could also offer additional insights (e.g. members of a peak body, suppliers, customers and contacts in the infrastructure-related construction sector). The survey ran from mid-September to mid-October 2020.

Demographics

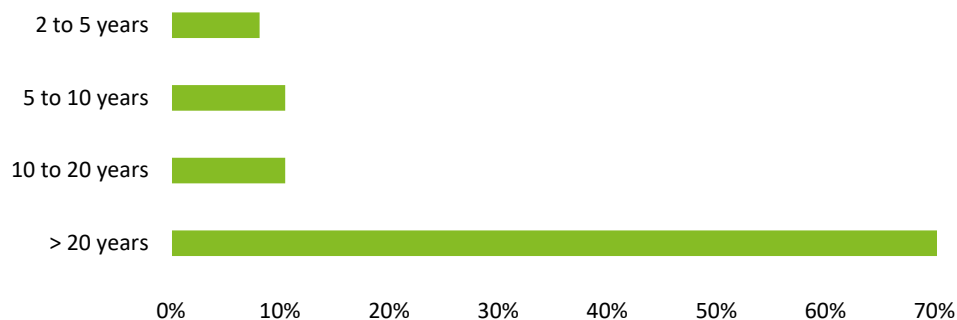
A variety of firms participated in the survey with operations across multiple regions of New Zealand. These firms varied in terms of maturity, number of FTE's and turnover.

Location of New Zealand operations*



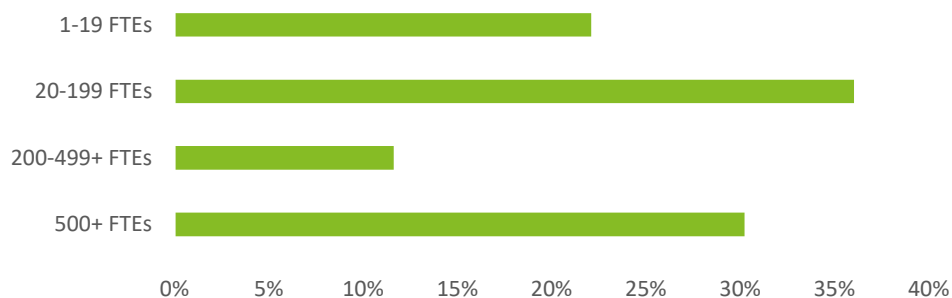
*Firms may have operations in multiple regions

Maturity of the firm



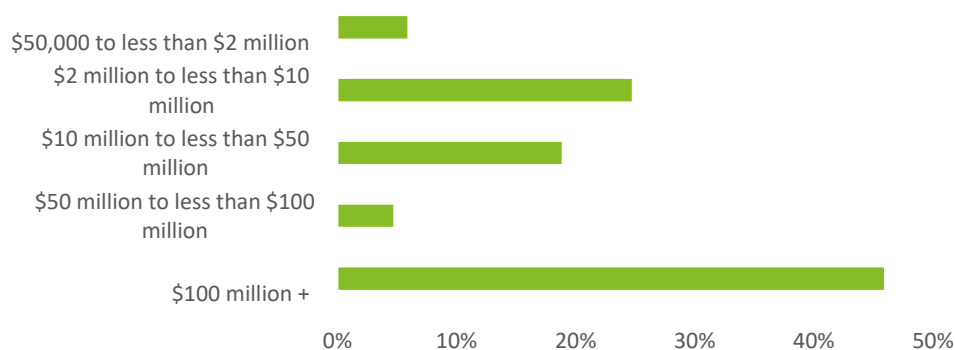
Most firms surveyed were mature, with 70% of firms having operated for more than 20 years. Firms that are 2 to 5 years of old were the smallest proportion of respondents.

Number of FTEs in FY19



78% of firms had more than 20 FTE workers in 2019, with 32% coming from very large firms with 500+ FTE workers.

Turnover in FY19



Almost half of respondents were from firms with turnover of \$100 million + in 2019 and 48% of the survey responses came from respondents at firms with less than \$50 million in turnover.

Survey questions

1	Organisation name	[Free text]
2	Contact	[Free text]
3	Location of New Zealand operations	<input type="radio"/> Northland <input type="radio"/> Auckland <input type="radio"/> Waikato <input type="radio"/> Bay of Plenty <input type="radio"/> Gisborne- Hawke's Bay <input type="radio"/> Taranaki <input type="radio"/> Manawatu-Wanganui <input type="radio"/> Wellington <input type="radio"/> Upper South Island (includes Tasman, Nelson, Marlborough and West Coast) <input type="radio"/> Canterbury <input type="radio"/> Otago <input type="radio"/> Southland
4	CONFIDENTIAL: What was your turnover range for your New Zealand operations in FY19?	<input type="radio"/> Zero to less than \$50,000 <input type="radio"/> \$50,000 to less than \$2 million <input type="radio"/> \$2 million to less than \$10 million <input type="radio"/> \$10 million to less than \$50 million <input type="radio"/> \$50 million to less than \$100 million <input type="radio"/> \$100 million +
5	CONFIDENTIAL: What percentage range of your annual turnover, for your New Zealand operations, would you classify as primarily related to the infrastructure-related construction sector in FY19?	<input type="radio"/> None <input type="radio"/> <20% <input type="radio"/> 21-40% <input type="radio"/> 41-60% <input type="radio"/> >60%
6	How long has your organisation been in operation?	<input type="radio"/> Less than 2 years <input type="radio"/> 2 – 5 years <input type="radio"/> 5 – 10 years <input type="radio"/> 10 – 20 years <input type="radio"/> > 20 years
7	CONFIDENTIAL: How many full-time equivalent (FTEs) did you have in FY19?	<input type="radio"/> Non-Employing (i.e. having no FTEs) <input type="radio"/> 1-19 FTEs <input type="radio"/> 20-199 FTEs <input type="radio"/> 200-499+ FTEs <input type="radio"/> 500+ FTEs

8 What percentage of your employees hold a working visa?	<input type="radio"/> 0% to 25% <input type="radio"/> 25% to 50% <input type="radio"/> 50% to 75% <input type="radio"/> 75% to 100%
9 Please nominate which of the following sub-sector(s) of the construction sector you operate in:	<input type="radio"/> Three waters (i.e. stormwater, wastewater, portable water) <input type="radio"/> Transport <input type="radio"/> Energy (i.e. generation, transmission, distribution, retail) Telecommunications <input type="radio"/> Social Infrastructure (i.e. schools, hospitals, prisons) <input type="radio"/> Commercial property <input type="radio"/> Residential property <input type="radio"/> Banking and finance <input type="radio"/> Engineering <input type="radio"/> Professional advisory <input type="radio"/> Other sectors not listed above – please specify
10 Please briefly indicate what your organisation specialises in:	<input type="radio"/> Horizontal infrastructure (for example road, rail, water, telecommunications, power) <input type="radio"/> Vertical infrastructure (for example buildings schools housing) <input type="radio"/> Other – please specify

COVID-19 impact questions: Impact on revenue for your New Zealand operations

1 CONFIDENTIAL: What was the impact on your turnover as a result of the recent Alert Level 3 lockdown in Auckland?	<input type="radio"/> None <input type="radio"/> 5% less <input type="radio"/> 6-10% less <input type="radio"/> 10%-20% less <input type="radio"/> >20% less
2 CONFIDENTIAL: What is the expected impact on turnover in Q3 2020 for your New Zealand operations?	<input type="radio"/> None <input type="radio"/> 5% less <input type="radio"/> 6-10% less <input type="radio"/> 10%-20% less <input type="radio"/> >20% less
3 CONFIDENTIAL: On a scale of 0% to 200%, what do you believe your organisation's profits for your New Zealand operations are, or will be, due to COVID-19 and associated effects (including government stimulus), where 100% was its state pre-COVID-19:	<input type="radio"/> 0% to 50% <input type="radio"/> 50% to 100% <input type="radio"/> 100% to 150% <input type="radio"/> 150% to 200%
4 CONFIDENTIAL: What are the potential impacts you see on pricing strategies in the COVID environment in New Zealand (relative to pre-COVID)?	<input type="radio"/> No change <input type="radio"/> Price discounting in order to secure work

☐ Price increases to recover cost increases

5 **CONFIDENTIAL: On a scale of 1-100%, where you have incurred additional cost due to the impacts of COVID-19 for your operations in New Zealand, how much additional compensation has been received from the vendor relative to the original contract value?**

- ☐ 0% to 25%
- ☐ 25% to 50%
- ☐ 50% to 75%
- ☐ 75% to 100%

6 **CONFIDENTIAL: What is the effect of COVID-19 on business capital investment in New Zealand? Please provide a percentage variation relative to your pre-pandemic state.**

- ☐ No change
- ☐ Increase of less than 5%
- ☐ Increase of less than 10%
- ☐ Increase of more than 10%
- ☐ Decrease of less than 5%
- ☐ Decrease of less than 10%
- ☐ Decrease of more than 10%

Supply chain and cost of materials in New Zealand

7 **What is the experienced/expected impact on cost of materials in Q3 2020 relative to a pre-COVID-19 period (i.e. December 2019) in New Zealand?**

- ☐ No change
- ☐ Change in line with inflation
- ☐ 1% to 5% increase
- ☐ 5% to 10% increase
- ☐ 10%+ increase

8 **What is the impact of border controls on access to resources in Q2 2020 and Q3 2020?**

[Free text]

9 **Has COVID-19 caused supply chain issues other than through border controls?**

- ☐ Yes
- ☐ No
- ☐ Not applicable

10 **Specifically, what are the primary reasons for supply chain issues?**

- ☐ Importing and/ or movement of building materials
- ☐ General issues with delays on construction sites
- ☐ Communication, accessibility and responsiveness of contractors and consultants
- ☐ Issues with Government not being able to make decisions to start and/or continue projects
- ☐ Lack of certainty over timing and readiness of projects
- ☐ Availability of skilled resources
- ☐ Other

Impact on employment and wages in New Zealand

11	CONFIDENTIAL: Did you apply for the wage subsidy scheme	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable (research institution etc.)
12	Did the subsidy save jobs within your organisation?	<input type="radio"/> Yes <input type="radio"/> No
13	How easy was it to access the wage subsidy?	<input type="radio"/> Very easy <input type="radio"/> Easy <input type="radio"/> Average <input type="radio"/> Difficult <input type="radio"/> Very difficult
14	Do you agree the wage subsidy was provided in a timely manner?	<input type="radio"/> Strongly agree <input type="radio"/> Agree <input type="radio"/> Neither agree nor disagree <input type="radio"/> Disagree <input type="radio"/> Strongly disagree
15	CONFIDENTIAL: To what extent will COVID-19 cause job losses in permanent employees in Q3 2020 for services provided in infrastructure-related construction in New Zealand?	<input type="radio"/> None <input type="radio"/> Increase in 2% to 5% <input type="radio"/> Less than 5% <input type="radio"/> 5%-10% less <input type="radio"/> >10% less
16	CONFIDENTIAL: To what extent will COVID-19 cause job losses in contractors in Q3 2020 for services provided in infrastructure-related construction in New Zealand?	<input type="radio"/> None <input type="radio"/> Increase in 2% to 5% <input type="radio"/> Less than 5% <input type="radio"/> 5%-10% less <input type="radio"/> >10% less
17	Have you had difficulty since March 2020, or expect to have difficulty in 2020 and 2021, in hiring employees with the necessary skills to meet demand in New Zealand?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
18	Specifically, what skills/areas of expertise have you had difficulty resourcing, or expect to have difficulty, in hiring employees in New Zealand?	[Free text]

19	Specifically, what skills/areas of expertise have you had difficulty resourcing, or expect to have difficulty, in hiring employees in New Zealand?	[Free text]
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20	CONFIDENTIAL: What is the effect of COVID-19 on training investment budgets and intentions in New Zealand? Please provide a percentage variation relative to your pre-pandemic state.	<input type="radio"/> No change <input type="radio"/> Less than 5% <input type="radio"/> Less than 10% <input type="radio"/> More than 5%
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Impact on business activity in New Zealand

21	Have projects stalled or prolonged in New Zealand as a result of COVID-19?	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable
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22	CONFIDENTIAL: Specifically, what is the type and value of stalled or prolonged projects?	[Free text]
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23	CONFIDENTIAL: What has been the cost of suspending or prolonging projects as a result of COVID-19, through demobilisation, standby and/or remobilisation activities?	[Free text]
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24	What are your expectations in the change in business activity for your New Zealand operations over the next one to five years?	<input type="radio"/> None <input type="radio"/> A decline of less than 5% <input type="radio"/> A decline between 5% and 10% <input type="radio"/> An increase of less than 5% <input type="radio"/> An increase of more than 10%
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25	What does the value of your 12-month forward order book look like compared to pre-COVID (March 2020)?	<input type="radio"/> No change <input type="radio"/> A decline of less than 5% <input type="radio"/> A decline between 5% and 10% <input type="radio"/> A decline of more than 10% <input type="radio"/> An increase of less than 5% <input type="radio"/> An increase between 5% and 10% <input type="radio"/> An increase of more than 10%
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Roadblocks and capacity

1	Prior to COVID-19, to what extent did your New Zealand operations have any residual delivery capacity?	<input type="radio"/> None <input type="radio"/> 10% <input type="radio"/> 20% <input type="radio"/> 30%+
2	How long would it take to ramp up your capacity to respond to increased demand in New Zealand?	[Free text]



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