



WAIHANGA ARA RAU
Construction and
Infrastructure
Workforce Development Council

Waihanga Ara Rau Workforce Development Plan

For Construction and Infrastructure

Discussion Document

Pepa wānanga

June 2022

Pipiri 2022



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Preface

Ehara taku toa i te toa takitahi engari he toa takitini - My strength is not one of a single warrior but that of many.

Welcome to the first Workforce Development Plan for the Construction and Infrastructure Workforce developed by Waihanga Ara Rau, the Construction and Infrastructure Workforce Development Council.

This discussion document will be used as a starting point for the creation of Workforce Development Plans for approximately 10 Strategic Industry Groups. These groups are referred to in this document as tier three or T3. We say approximately because industry will decide on the final groupings which may result in more or less than the options listed below.

When we have completed this we will develop workforce Development Plans for all 57 Industries within the scope of Waihanga Ara Rau.

This plan looks at past workforce trends, captures a snapshot of the current workforce and paints a picture of the future workforce. The document is deliberately high level as it is a living document. This will be updated as we develop workforce development plans for strategic industries groups and ultimately individual industry workforce development plans.

This is a discussion document, and we want you to tell us your answers to the questions in it. These will differ by industry, and by companies within an industry, and potentially by regions of the country.

Your answers are important to ensure we are developing a workforce plan that meets the industries needs in the future and helps it adapt to whatever that future brings.

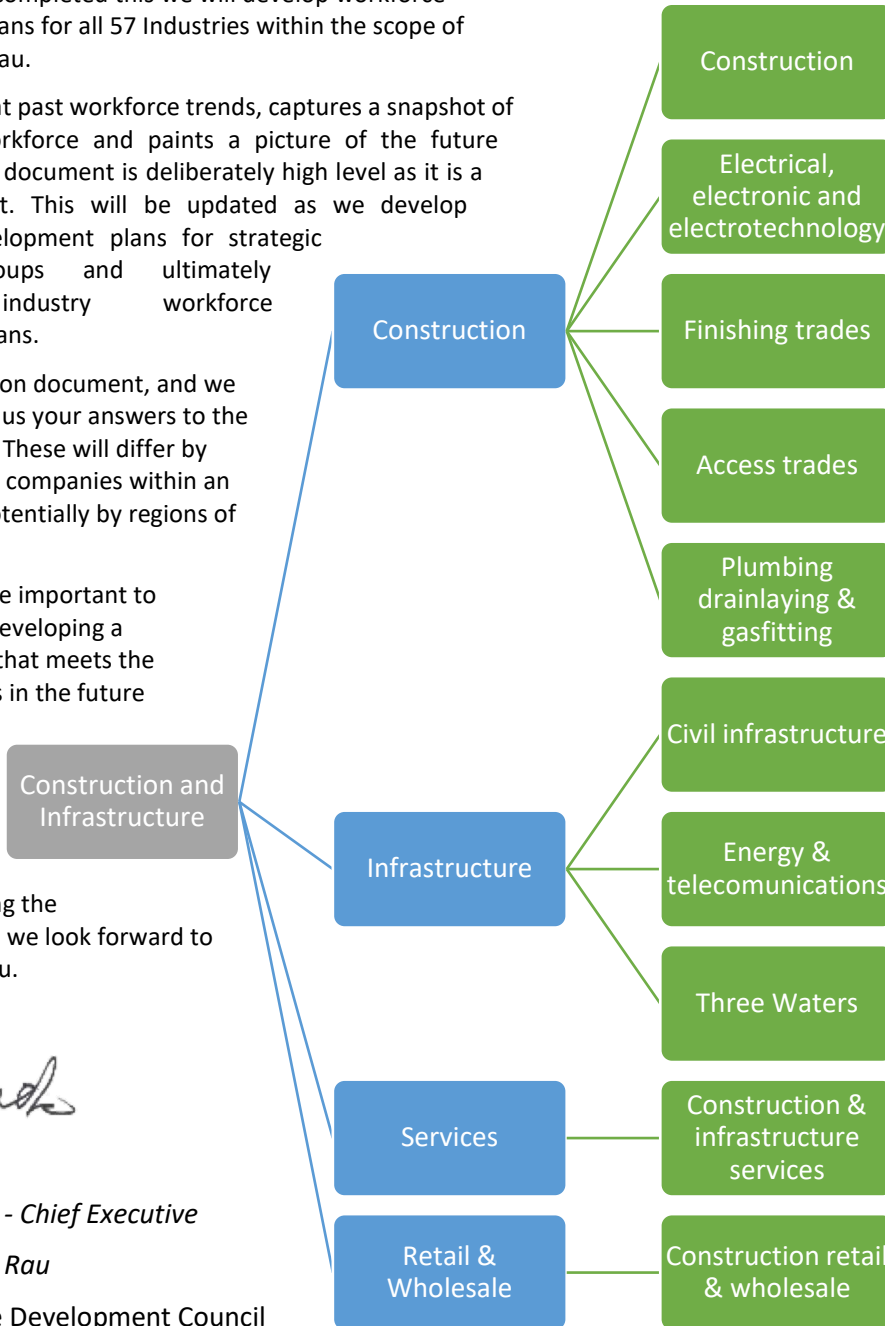
Enjoy the reading the information and we look forward to hearing from you.



Philip Aldridge - Chief Executive

Waihanga Ara Rau

The Workforce Development Council for Construction and Infrastructure



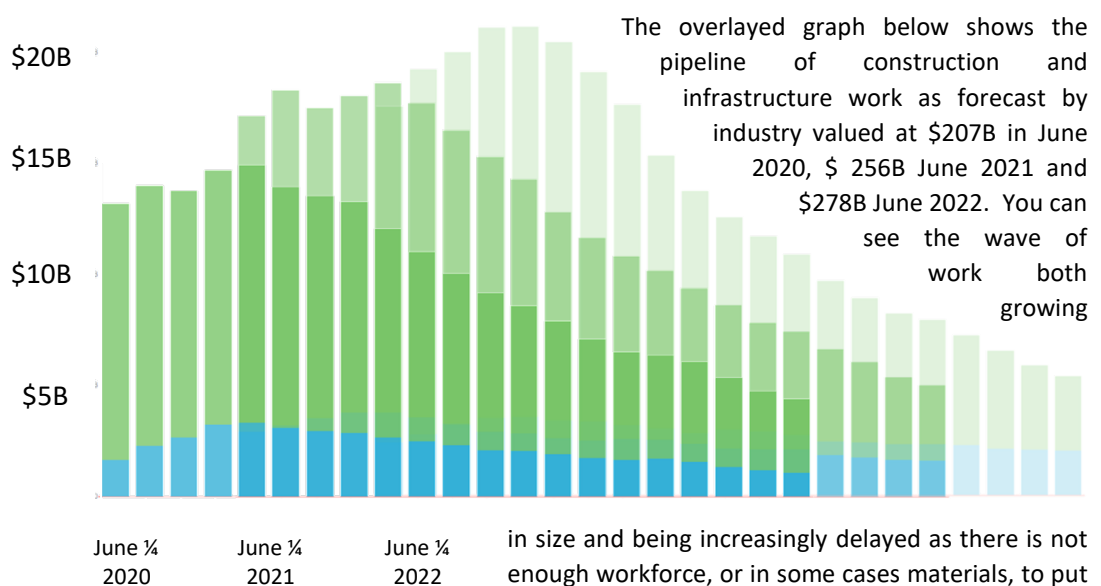
We want to ensure you:

See yourself in this document

Organisation Wide Workforce Development Plan			
Individual Construction Industries	Strategic Sectors	Strategic Sectors	Infrastructure Strategic Sectors
Concrete construction, carpentry, stonemasonry, brick & blocklaying, interior systems, glazing, roofing.	On site Construction	Civil Infrastructure	Bitumen production, road construction & maintenance, contract & project management, road marking, temporary traffic management, deep piling & foundations, forestry earthworks.
Concrete production, pre-cast and product manufacture, frame and truss manufacture, timber joinery, architectural aluminium joinery	Off Site Manufacturing	Energy & Telecoms	Electricity supply, telecommunications, and gas reticulation.
Electrical engineering, electronic engineering, electrotechnology, industrial measurement and control.	Electrical, Electronic & Electrotechnology	Three Waters	Drinking water, stormwater, wastewater (including Pipeline Construction and Maintenance).
Painting and decorating, flooring, kitchen & bathroom design, floor and wall tiling, exterior plastering.	Finishing Trades	Strategic Sector	Construction & Infrastructure Occupations
Cranes, scaffolding, rigging, industrial rope access.	Access Trades	Construction & Infrastructure Services	Quantity surveying, project management, architectural technology, asset management, surveying, trade supply, building information modelling, procurement.
Plumbing, drainlaying & gasfitting	Plumbing, Drainlaying, Gasfitting	Retail & Wholesale Sector	Retail & Wholesale Industries
		Construction Retail & Wholesale	Plumbing goods and furniture & floor covering wholesaling. Floor coverings, electrical, electronic, & gas appliance retailing and hardware and building supplies retailing

Not sure your industry is within the Waihanga Ara Rau Workforce Development Council for Construction and Infrastructure coverage? Type in your industry name [here](#) and it will show you which council covers you.

Can ride the wave of work



Construction project values are the green bars and infrastructure values are the blue.

Each bar represents three months

Are prepared for the future of work

Lots of things are changing such as carbon neutral and environmental requirements, technology and the future workforce.

But some things are not changing fast enough such as industry productivity, gender and ethnic diversity, retention and training. We have some insights, observations, questions and suggestions but the answers and direction will be decided by industry, iwi and the communities which initiate projects – **let talk! Tīmata te kōrero**

Introduction

The intent of our Workforce Development Plan is to ultimately deliver a vocational education system that aligns to our industries' needs. To deliver on this intent, we must have a vision and a strategy in this plan will propose options to fulfil this purpose, as a starting point for discussion. As we build Workforce Development Plans for each strategic industry groups and their component industries (see the suggested groups on the previous page), we expect the plan to become more refined and detailed as we build a greater understanding. These Workforce Development Plans will be continually updated and reflect our most up-to-date view of what we expect to become a progressive and resilient sector.

Over this next year, we will engage closely with industry and use this plan as a conversation starter with the aim to build an agreed and cohesive voice to advance the interests of the sectors we represent. Given that we are looking at a Workforce Development Plan from a national multi-industry viewpoint, it is more complex than developing a plan for a single organisation.

This document is about you! Our role is to partner with you and work together towards an agreed vision and strategy. You can expect us to challenge existing views and practices where our research identifies them as hindering the progress of your industry and suggest viable alternatives. But you can also rely on us to amplify your voice to government. While this is especially true in the education space where the Tertiary Education Commission is expected to listen to our advice, we will also advocate for our industries in other environments such as immigration.

There are questions included throughout the document and summarised in 'what do you think?' section in the plan appendices. A link to an online survey where you can tell us about your thoughts in relation to one or more of the questions asked is included in the Appendix.

The intent of our Workforce Development Plan is to ultimately deliver a workforce that aligns to our industries' needs. To deliver on this intent, we must have a vision and a strategy - this plan will propose options to fulfil this purpose, as a starting point for discussion.

Over the next year, we will engage closely with industry and use the plan as a conversation starter to build an agreed and cohesive voice so we can advance the interests of the sectors we represent. Given that we are looking at a Workforce Development Plan from a national multi-industry viewpoint, it is

more complex than developing a plan for a single organisation. However regardless of the industry one thing remains the same.

People

He aha te mea nui o te ao?

What is the most important thing in the world?

He tangata he tangata he tangata!

It is people it is people it is people!

This iteration of the Plan is designed to share our current thinking with industry from our own research, and deep dive into the research of others, we know our industries are facing big systemic challenges.

Our recent research projects brought these challenges into sharp focus while also exploring the opportunities available to our industries:

In February 2022, we released Re-Energise Ngā Mahi a Māui, a stage one look at creating pathways for the future of the energy workforce.

In May 2022, the Water Workforce Analysis by Deloitte was released, commissioned by the Department of Internal Affairs and Waihanga Ara Rau.

In July 2022, our [Regional Construction Workforce Planning and Development Project](#) report series, thoughtfully examines how we might achieve the change required to become a resilient industry. The reports encompass ANZSIC E classifications (the Construction sector, which includes civil infrastructure), and in the upcoming year, we aim to increase our

The vision is a variation of the Construction Transformation Plan: A high performing construction and infrastructure sector for a better New Zealand.

understanding of our non-E categories (Energy, Telecommunications, Three Waters, Construction & Infrastructure Services, and Retail & Wholesale), which are naturally of equal importance to us.

The project identified gaps between our current and future desired state as well as key inhibitors and solutions which informed a recommendation to adopt an Operations Excellence Strategy. We also outlined some key elements required to execute this strategy which require new training and development programmes.

All three research reports help to build an understanding of the respective sectors and will enable engagement and collaboration with industry. This partnership will help to shape and inform a vocational education programme capable of supporting the strategic objectives of each of the industries we serve.

Alongside our own work, in February 2022, Government released its Te Mahere Whai Mahi Māori - The Māori Employment Action Plan. The plan aims to accelerate efforts in supporting more Māori to find quality work. Waihanga Ara Rau's focus is to champion Māori achievement covering participation, completion, progression, and business leadership. We are working with Te Puni Kōkiri, the Government's principal policy advisor on Māori wellbeing and development, to develop two workforce development plans for Māori covering Construction and Infrastructure. This work complements workforce development work completed by the Civil Contractors Association.

We also have a focus on the participation, completion, progression and business leadership of women, Pacific people, and those with disabilities as we seek to support a construction and infrastructure sector that reflects its clients and the communities they support. This mahi is complemented by the Construction Diversity Roadmap Report developed by the Construction Sector Accord. In this Workforce Development Plan, we put forward our view based on what we have learned through this work and offer it as a basis for future discussion with the aim of coming to an agreed vision and strategy that we can all work to achieve.

Building an education system for resilience and transformation

Needs and aspirations must be clear and understood before design, planning and execution can take place. To build a vocational education platform that enables its learners to maximise their contribution to the industry, we must understand both the past and the present while developing the vision for the future in partnership with the industries we serve. That's why we have undertaken an environmental scan looking at the current and historical workforce.

Waihanga Ara Rau the Construction and Infrastructure Workforce Development Council was created to facilitate the voices of construction and infrastructure industries to lead the development of a more sustainable, globally engaged, and adaptive construction and infrastructure workforce in New Zealand.

We will contribute to a vocational education and training system that provides opportunities for all people to reach their full potential and capabilities in the construction and infrastructure industries, including those who have been traditionally underserved by the education system; and ensure the construction and infrastructure vocational education and training system provides opportunities for all people in the construction and infrastructure workforce to reach their full potential. We will contribute to an education system that honours Te Tiriti o Waitangi and supports Māori-Crown relations; and seek to contribute to an education system that helps ensure fair and equitable outcomes for all, while supporting clear career pathways and a sustainable workforce pipeline that will support the responses to New Zealand's current and future construction and infrastructure workforce needs.



1. Executive Summary – Future of Work

The construction and infrastructure sectors’ future transformation will be closely linked with improving productivity and the capability to do more with comparatively fewer people. Our aim is to work closely with industry to identify and build skills and capabilities that provide the right numbers of people with the right skills in the right place at the right time.

We see the ultimate goal as Improving Resilience – “a sector with strong, sustainable businesses with the capacity to innovate and adapt to change and disruption.” Increasing productivity and raising capability are the ‘how to’ elements – achieving these two things will build resilience.

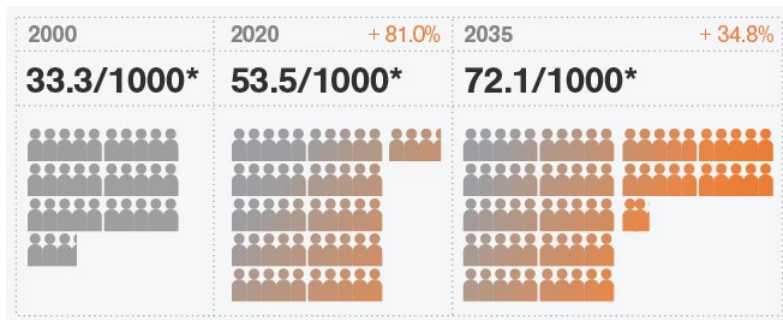
As we have said it is all about people! Here is where workforce development fits in – and why we are having this conversation. The following summary is an insight into the content of this discussion document.

Diverse, Equitable and Inclusive Industries

As part of improving resilience, we believe our workforce needs to both reflect and enhance our communities. Attracting and developing talent from across the community is critical to our industries’ future ability to raise its capability and develop a workforce that can service existing and future demands. The development of our workforce plans will focus on the continued importance to develop a diverse, equitable and inclusive (DEI) workforce. The vision of this work is as follows:

“A sustainable, diverse and inclusive workforce where everyone can see a good career pathway in construction.”

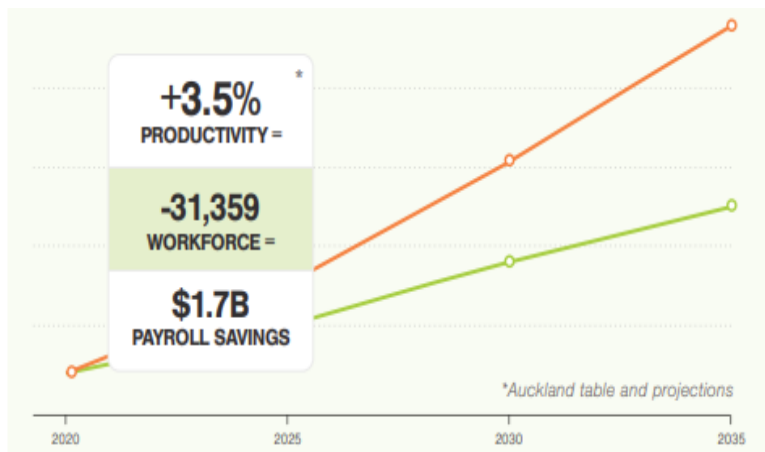
Workforce Dynamics



The Workforce Metric (WM) - our proportion of the total workforce - shows us that the construction workforce has grown exponentially, from 33.3 in 1,000 people 20 years ago to 53.5 in 1,000 today. If this trend continued the

construction and infrastructure share of the employment would reach 72.1 in 1000 people in 2035. We challenge how realistic is it for industry to expect an ever-increasing share of the labour market pie.

Productivity



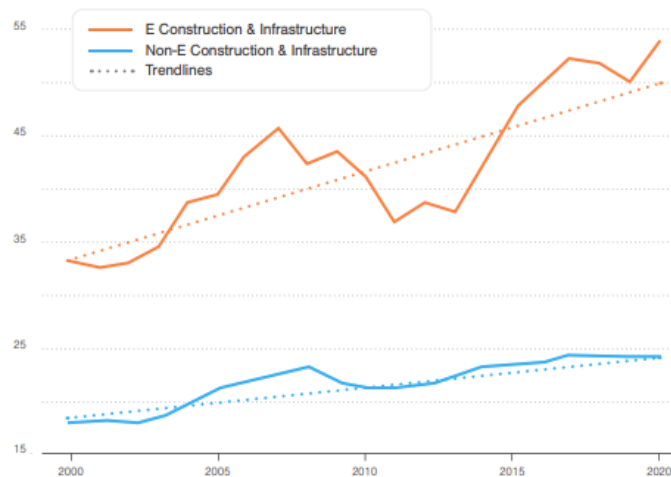
We believe our future efforts need to focus on productivity improvements.

The graph to the left illustrates the results of a modest annual productivity improvement of 1.4% to 3.5% per annum, instead of the previous average of 2.1% can make a significant difference.

Stop Reactive Decimation

Whilst we see future opportunities through the broadening the workforce through improved diversity as well as focusing on productivity improvements. Reactive decimation is a critical hand break to developing a resilient industry.

Reactive decimation is the culling of the workforce in response to cyclical market conditions. The below graph highlights a workforce with strong rolling peaks and troughs, decimating our skilled workforce in response to economic cycles.



These sharp cyclical swings have multiple negative effects on our industries:

Recruitment – becomes more challenging for an industry that is perceived as being an unstable career choice.

Retention - many skilled workers leave the industry for more predictable job opportunities

Backlog of work - is expensive and prone to reduced quality of output due to heightened urgency

Climate Change Response

The national climate change response agenda is real and will without a doubt affect our industries in many ways. We highlight some of these ramifications and how our industries, with the right knowledge and skills, will make a positive impact in key areas such as waste and energy usage reductions.

Challenging the skills and training system

Waihanga Ara Rau will work with training providers to challenge our current skills and training system to raise capability so to fit our industries' needs into the future. Our role is to ensure it has a stronger focus on employers and industry skills needs, providing more support for employees, and ensuring greater consistency in vocational education across the country.

In order to achieving our transformational ambition of creating resilient industries – more and different training and development programmes catering to life-long learning will be needed. Micro Credentials will be a key component of these life-long learning programmes.

How this document is structured

1. **Industry Past and Present** - Our Workforce Development Plan starts with an overview of the Industry Past and Present, beginning with a high-level environmental scan – looking at our past and providing a stock-take of our current position. We use three primary lenses:

Demographic profiles – age, gender, ethnicity, education, learners

Economic analysis – productivity, market forces, demand pipeline, economic cycles, and reactive decimation of our workforce

Operational profiles – industry business numbers, size, workforce structure.

2. **Future of Work** - The second part looks at the Future of Work, including a projection for our workforce requirement in 2035 based on current trends and the future of work. Issues identified in our previous work in the Regional Construction Workforce Planning and Development Project prompts us to consider optimising workforce capacity, broadening our workforces' demographic profile and responding to climate change initiatives. We use five primary lenses:

Change in Population and Workforce – the continued importance to develop a diverse, equitable and inclusive (DEI) workforce

Climate Change Response, a Reality of the Future – ramifications and how our industries, with the right knowledge and skills, will make a positive impact

Economic Analysis – the importance for our industries to overcome current economic challenges and turn them into opportunities in the future

Transformational Change Models – provide four models that show how we might achieve more with less, and how we could defer or cancel projects with least detriment to our societies

Challenging the skills and training system – outline how we will work with training providers to challenge our current skills and training system to fit our industries' needs into the future.

How we refer to our industries

We have structured industry groupings into Tiers:

- **Tier One (T1)** represents all of the industries covered by Waihanga Ara Rau
- **Tier Two (T2)** are broad groupings of industries that relate to Construction, Infrastructure and C&I Services
- **Tier Three (T3)** represents the strategic industry groupings under Construction, Infrastructure and C&I Services (identified in Figure A)

These groupings may change as we have more discussions with you and learn more about what makes the most sense.

We also refer to ANZSIC **E and non-E classifications**.

The **E classification** represents all of construction (vertical construction) and civil infrastructure (horizontal construction) which make up the Construction sector in economic reporting.

The **non-E classifications** include Telecommunications, Energy, Three Waters, Construction & Infrastructure Services, and Retail & Wholesale – each reported under different economic sectors.

This distinction is important because E and non-E have different: economic and workforce drivers, business models and economic volatility, so in some parts of the report we report on these groupings separately.

2. Industry Past and Present

“Life is divided into three terms – that which was, which is, and which will be.

*Let us learn from the past to profit by the present, and from the present, to live a better future” -
 William Wordsworth*

Titiro whakamuri, kōkiri whakamua

“Look back and reflect so we can move forward”

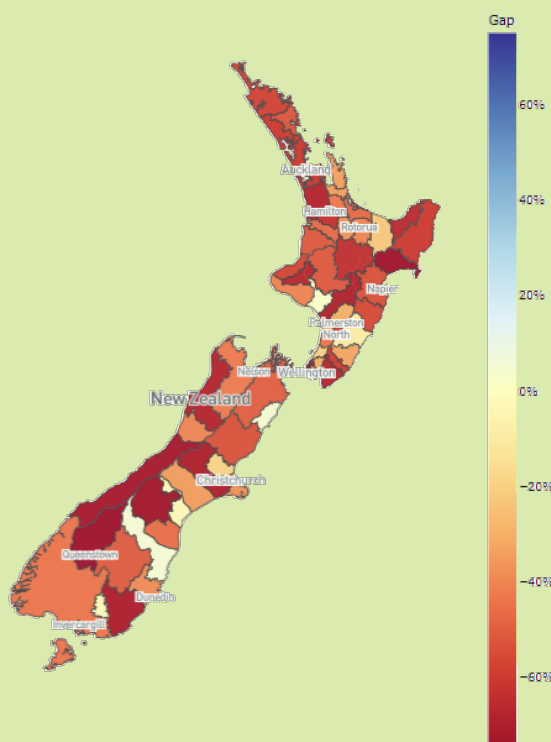
Māori Whakataukī

To predict our future, we must understand our past, and properly assess our current position. That’s why when developing plans to guide us towards the future state we desire, we must start by examining learnings derived from past lessons while also being candid about our current condition.

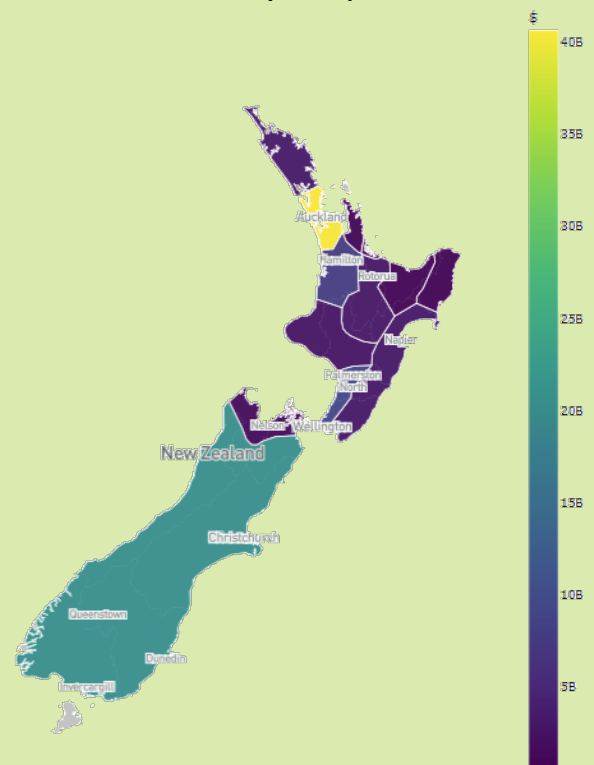
The scope of analysis undertaken always depends on the complexity of the entity the plan is being developed for. In our case, we are looking at a nation’s series of industries responsible for the physical foundations of our society – which means it’s rather complex. Because it is a national view, public and social policy also influence the desired outcomes, it’s not just an economic perspective.

Therefore, our report has a high level but expansive look at our industries’ demographics, organisational and economic factors. In looking at the past, we want to identify what we want to repeat, what we want to avoid/fix, and where we want to go from here.

Estimated Workforce Shortage



Current Value of work in the Project Pipeline by iwi ropu



Source Workforce Information Platform (WIP) <https://wip.org.nz/>

Demographic Profiles

Overview

The construction and infrastructure sector's historic lack of diversity means our industries have and are missing out on a significant proportion of potential workers and skills, which, in addition to a rejuvenated supply of skilled workers, bring valuable diverse backgrounds, perspectives, and insights.

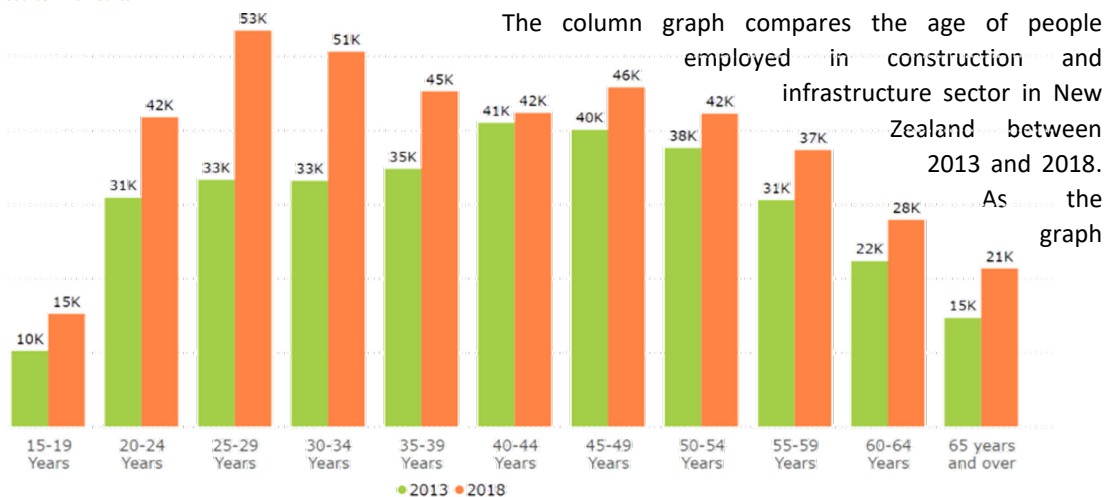
Waihanga Ara Rau will have a strong focus on ensuring future industry transformation builds on recent improvements towards a more diverse workforce, making equity and inclusiveness a positive change for industry, workers, and New Zealand as a whole. Our future supply of skilled workers must include the participation and inclusion of all people so they can reach their full employment potential and help lift the performance of our construction and infrastructure sectors.

Key findings:

- Our workforce is getting proportionately younger.
- At the same time, the employment of 65 years and over employees increased by 45.34% between 2013 and 2018.
- Compared to the total economy, our workforce is more European, Māori and male dominant.
- Both 2018 census employment figures and recent tertiary enrolment data show strong growth of Māori, Asian and Pacific workers/students within our sectors.
- Nevertheless, Māori and Pacific people are underrepresented in higher skilled, management and ownership roles
- Women and Asian ethnic groups are our most underutilised demographic groups
- Apprentice Boost Programme resulted in an increase in learner numbers across most demographic groups.

Workforce Age Distribution

Figure 1: Tier one workforce age distribution based on census data
 source: Infometrics



shows, we have not been losing our mature workforce, in fact we have been attracting mature people into our ranks. Anecdotally, we should prepare for a period of losing a greater number of our mature workforce which are likely to form a significant share of existing business owners. This may offer an opportunity for some consolidation within industry, but it also posing a risk that must be mitigated.

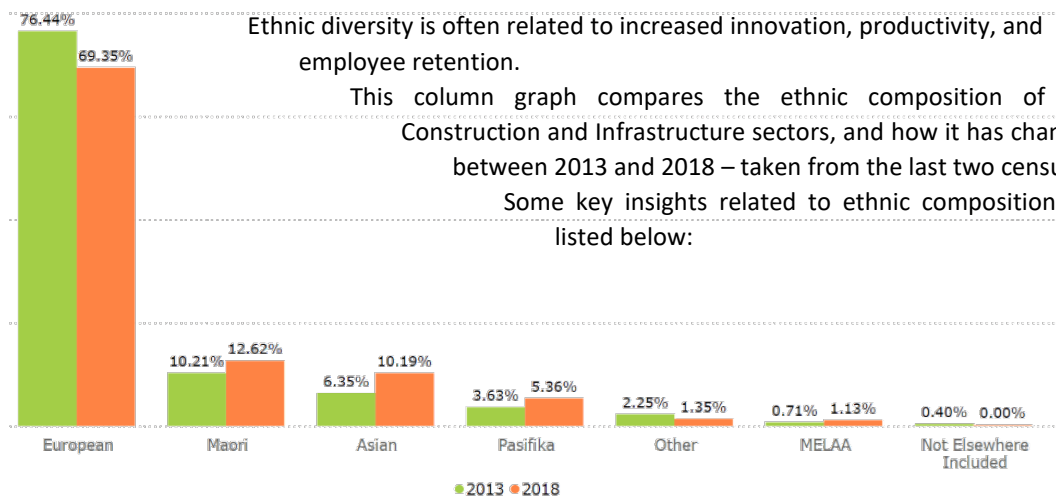
Some key insights related to age distribution are listed below:

- We attracted more young people in 2018 as compared to 2013, employment of 15 to 19 years old employees increased by 48.9% (5000 employees). However, their share in employee population was only 4.1% in 2018.

- In 2018, employment among employees aged between 25 to 29 years and 30 to 34 years increased by 60% (20,000 employees) and 52.53% (18,000 employees) respectively. Their share in employee population also increased by 2.3 and 1.6%.
- According to Statistics New Zealand, more New Zealanders are working into their retirement and similar trends can be seen in Construction and Infrastructure sector. Employment of 65 years and over employees in this sector have increased by 45.34% (6000 employees) in 2018. Their share in employee population also increased from 4.7% in 2013 to 5.2% in 2018. The older age profile of a sector can indicate an impending need for workforce replacement.
- The largest age group cohort of employees in 2018 was the 25-29 years (53,000), followed by 30-34 years (51,000,) whereas in 2013 maximum employees aged between 40 to 49 years. This indicates that we are beginning to redress the age profile of the sectors, but further analysis by industry may not show a consistent pattern.

Figure 2 Our ethnic composition is changing slowly

source: Infometrics



Ethnic diversity is often related to increased innovation, productivity, and employee retention.

This column graph compares the ethnic composition of our Construction and Infrastructure sectors, and how it has changed between 2013 and 2018 – taken from the last two census.

Some key insights related to ethnic composition are listed below:

- In 2018, there was increase in employees with Māori, Asian and Pacific by 62.6% (18,543 employees), 111.15% (20,486 employees) and 94.20% (9,222 employees) respectively.
- Although there was a decrease in the share of European employees in 2018, their total number increased in 2018 by 9.41% (43,038 of employees)

Figure 3: How our ethnic composition compares with the total economy

Source: Infometrics

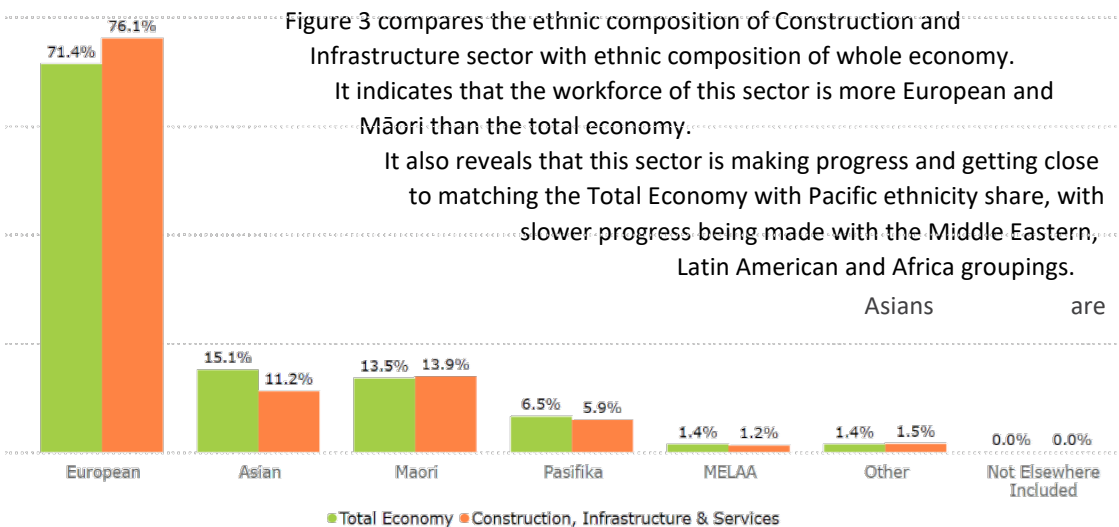


Figure 3 compares the ethnic composition of Construction and Infrastructure sector with ethnic composition of whole economy.

It indicates that the workforce of this sector is more European and Māori than the total economy.

It also reveals that this sector is making progress and getting close to matching the Total Economy with Pacific ethnicity share, with slower progress being made with the Middle Eastern, Latin American and Africa groupings.

Asians are

underrepresented in our workforces at 11.2% versus a total economy share at 15.1%. Alongside women (see Figure 4), this a our most underutilised group of workers.



Created by Gregor Cresnar from the Noun Project

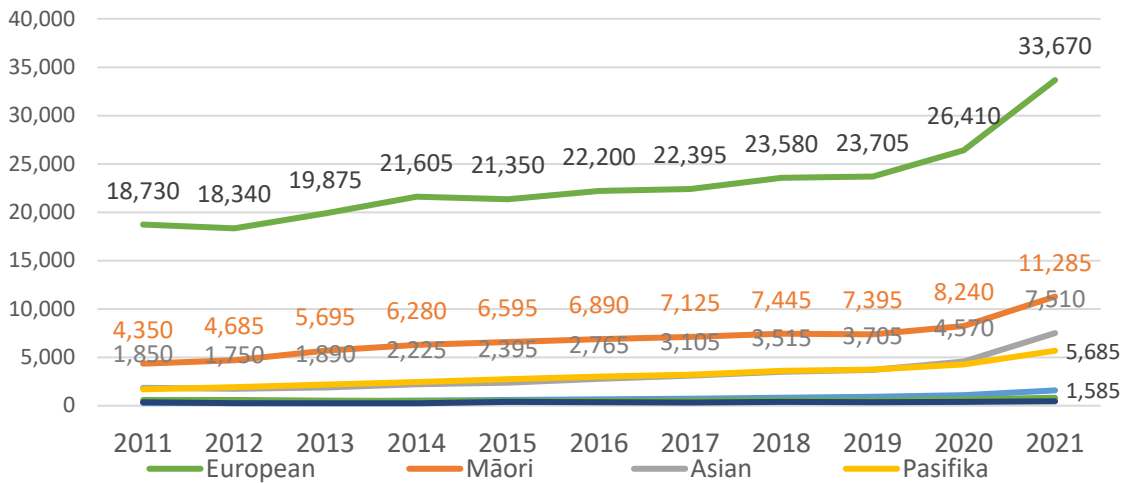
Thinking of your own business/industry, do you feel you have a diverse workforce?

Click to [Answer online](#) or scan the code below



Figure 4: Learner enrolment trends over time by ethnicity

Source: TEC Nga Kete Data



Between 2019-2021, the number of learners has grown quickly:

- Māori learners +53%
- Pacific learners +52%
- Asian learners +103%
- European learners +42%

Table 1: National ethnic population projections: 2018(base)-2043

Source: Stats NZ <https://www.stats.govt.nz/information-releases/national-ethnic-population-projections-2018base-2043#projection>

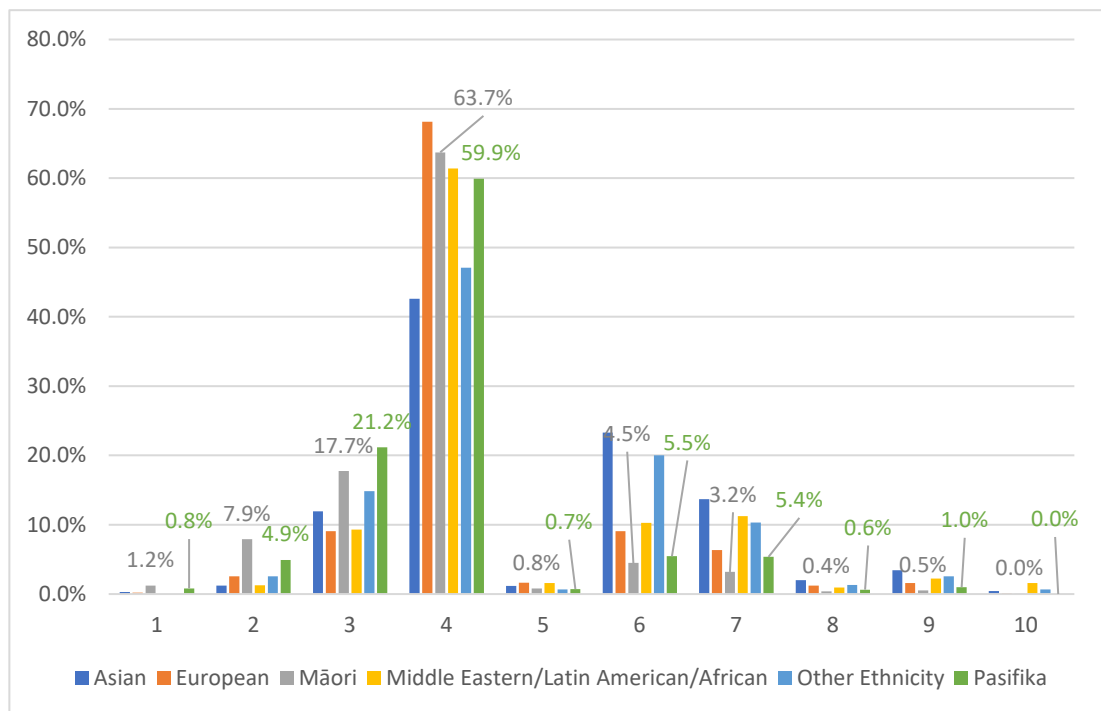
	European	Māori	Asian	Pacific	Middle Eastern/Latin American/African	Chinese	Indian	Samoa
2018	55.2%	13.1%	12.4%	6.5%	1.2%	4.3%	4.2%	3.1%
2023	52.5%	13.2%	13.6%	6.7%	1.4%	4.7%	4.7%	3.2%
2028	50.0%	13.3%	14.8%	6.8%	1.6%	5.0%	5.1%	3.3%
2033	47.8%	13.5%	15.9%	7.0%	1.7%	5.2%	5.5%	3.4%
2038	45.7%	13.7%	16.8%	7.1%	1.8%	5.4%	5.9%	3.5%
2043	43.7%	13.9%	17.7%	7.3%	2.0%	5.6%	6.3%	3.6%

New Zealand's total population is projected to grow from 4.9 million in 2018 to 6.1 million in 2043, an average annual increase of 0.9 percent, according to the median projection. All ethnic populations are projected to grow between 2018 and 2043, with the highest rates of growth in the MELAA and Indian ethnic groups, with an average annual increase of 3.3 percent and 3.1 percent, respectively. The 'European or Other' ethnic group is projected to have the lowest rate of increase of 0.5 percent a year between 2018 and 2043.



Figure 5: Learner numbers in NZSCED Architecture and Building in 2021 by ethnicity

Source: TEC Nga Kete Data



2021 learner data in the area of Architecture and Building shows that a disproportionate Māori and Pacific people are overrepresented in NZQF level 1 to 3 programmes and underrepresented at NZQF levels 5 and above. NZQF level 4 is generally associated with trade qualifications. Further research and sector specific analysis is required to better understand this dynamic and how training and industry employment practice can support progression into higher level programmes. People working in roles associated with programmes below level 3 are more likely to be more affected by cyclical downturns.

Māori Workforce

Māori have historically and continue to experience unequal education and employment outcomes in our economy. The construction and infrastructure sectors are no different, even with Māori being relatively well represented proportionally in our industries. The latest census figures (2018) show that Māori comprise almost 14% of the construction and infrastructure sector workforce, which is higher than the national average of 13.5%.

Based on the training pattern of Māori learners less of the Māori workforce is found in higher skilled, management and ownership roles suggesting our education, training and workplaces are not providing adequate support for ākonga Māori, kaimahi Māori and Māori businesses development.

Creating a level playing field

Having the right education, training and career support are key factors in creating a level playing field for Māori in finding and retaining quality employment. Historically, Māori experience worse educational outcomes than other New Zealand learners. Negative education outcomes have a direct impact on participation in the labour market and employment outcomes. This has significant social, cultural, health and economic impacts on individuals, and on iwi, hapū and whānau, spanning generations.

Waihanga Ara Rau believes creating a level playing field for Māori is a basic obligation of Te Tiriti o Waitangi.

Examples of creating a level playing field for Māori learners could include:

- Te Reo Māori based tertiary education and training.



Created by Gregor Cresnar from the Noun Project

How can the goal of increasing the number of Māori learners and workers in higher skilled, management and ownership roles be practically supported?

Click to [Answer online](#) or scan the code below



- earning and career pathway planning tools Basic tools for success
- Wānanga learning environment
- Resources available in Te Reo Māori
- Supportive work environment

Opportunities

A large and growing young-Māori cohort, coupled with increased industry demand for skilled workers across most of our construction and infrastructure industries, mean many opportunities will be available to Māori if given the opportunity to upskill and develop in their roles.

More on the future for Māori learners is discussed in section two of this report “Future of Work”

Gender Imbalance

Figure 6: Our gender imbalance

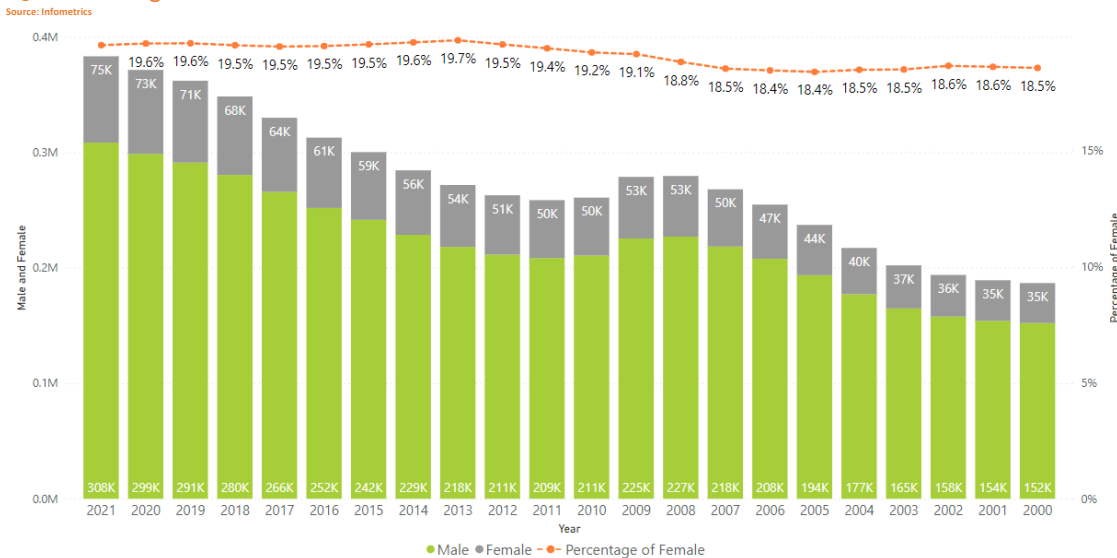


Figure 6 shows the number of employees who worked in Construction and Infrastructure sector by gender between 2000 and 2021. It can be observed that number of women employed in this sector have increased by 114% in last 21 years but their share in the employee population was only 19.5% in 2021 which has only increased by 1% since 2000. It is believed that most females in this sector are working in administrative positions rather than technical roles. This highlights a huge potential for increasing our potential pool of workers if we can find ways to attract more females into the sector.



In 2014, Ministry of Women in New Zealand identified 213,000 women were underemployed, unemployed or in potential workforce. According to Statistics New Zealand, there are more women in NZ than men. Therefore, attracting women to workforce can help with skill shortages. International research also suggests that there is a need to attract women to construction and infrastructure sector.

Qualifications

Higher educational attainment, in terms of recognised qualifications, produces many positive outcomes, including better income and workplace productivity.



Created by Gregor Cresnar from the Noun Project

How can industry and training providers increase the participation and success of women in trades?

Click to [Answer online](#) or scan the code below



Figure 7: Qualifications (highest school) + (highest post school)

Source: Infometrics

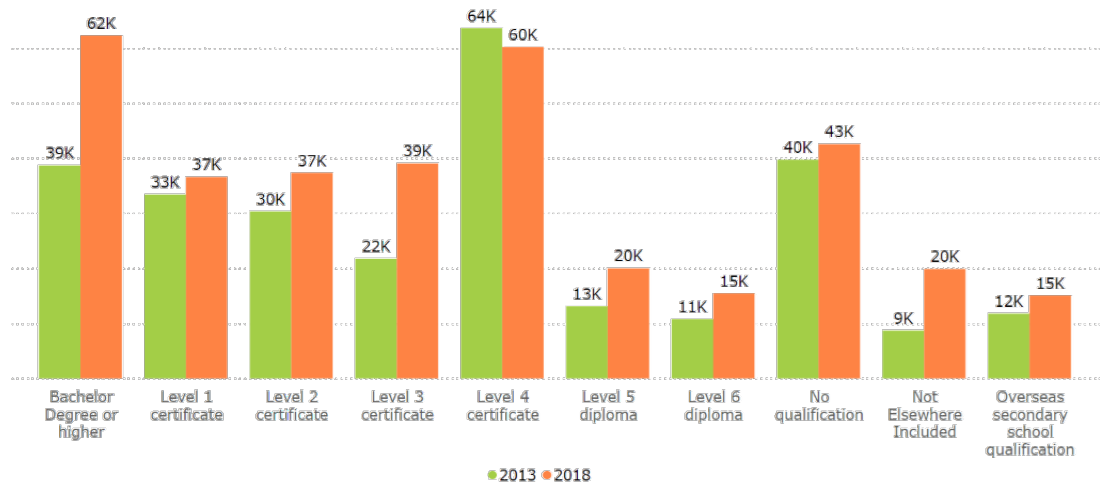


Figure 7 compares the highest qualification of people employed in the Construction and Infrastructure sector in New Zealand between 2013 and 2018.

Analysis at industry level is expected to give a more meaningful picture which may highlight that certain actions are required.

Some Key insights from the high-level data are listed below:

- In 2018, the largest cohort had a bachelor's degree or higher (62,000 employees) and made up 17.9% of the workforce. In contrast, employees with level 4 certificates had the highest share (23%, 63,500 employees) in 2013.
- Although employees with no qualifications have increased in 2018, their share in total employee population has decreased from 14.6% in 2013 to 12.2% in 2018.
- It can be observed that more employees completed Diploma and bachelor's degree in 2018 as compared to 2013.

Disabled People

Figure 8: Disability trends by sector

Source: Labour market statistics, 2021

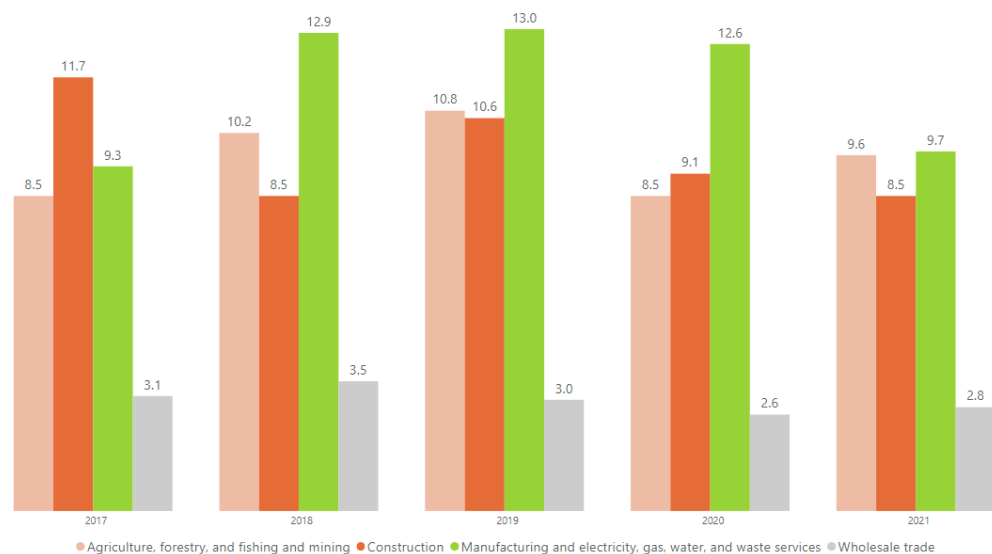


Figure 8 demonstrates the percentage of disabled people employed (above 15 years of age) by the four sectors as a percentage of the disabled workforce between 2017 to 2021:

- Agriculture, forestry, fishing, and mining
- Construction

- Manufacturing, electricity, gas, water, and waste services
- Wholesale Trade.

Disabled people are those who have at least a lot of difficulty seeing or hearing (even with glasses or hearing aids), walking or climbing stairs, remembering, or concentrating, self-care, or communicating. Disability status is determined by set of questions that ask respondents about their ability to carry out six basic tasks:

- Seeing (even with wearing glasses)
- Hearing (even with hearing aid)
- Walking or climbing steps
- Remembering or concentrating
- Washing all over or dressing
- Communicating

People who respond ‘a lot difficult’ or ‘Can’t do at all’ to at least one of the activities mentioned above are counted as disabled.

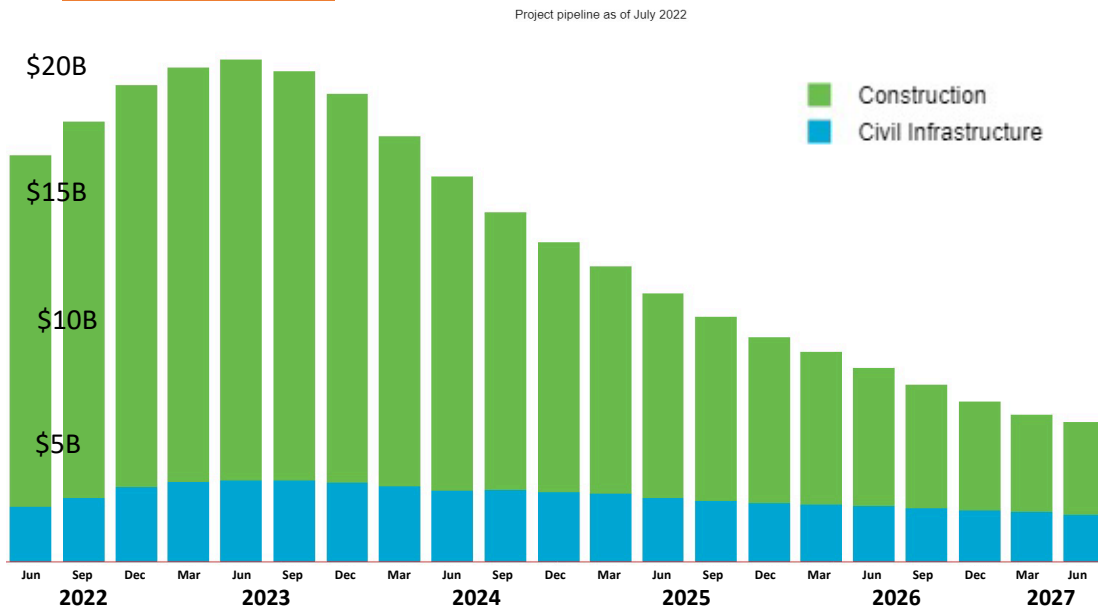
Some industries in the graph given above are combined due to reliability of data from small industries. These are categories are combined to correspond with the New Zealand Standard Industrial Output Categories (NZSIOC).

Diversity, equity, and inclusion (DEI) are important qualities of any workforce and indicators of the development and sustainability of an industry. In 2021, 8.5 percent of disabled people were employed in Construction industry. However, there is a downward trend in the proportion of disabled workers employed in Construction over the last years. Manufacturing, electricity, gas, water, and waste services have also seen a decrease in the share of disabled workers employed in 2021.

Neuro disabilities should form part of our future conversations but requires further investigation.

Construction and Infrastructure Project pipeline of work

Figure 9: Pipeline of work by quarter with project values spared over time as at July 2022
 Source <https://wip.org.nz/project-pipeline/>



The total sum of construction and infrastructure project pipeline value in July 2022 was \$276,496,813,689 you can see how the pipeline has grown over the last two years at <https://wip.org.nz/project-pipeline/>

Economic Analysis

Overview

Historically, the focus of New Zealand’s construction workforce has been on increasing the number of people on the tools. This has led to a lack of growth in productivity and maturation of many of our strategic sectors. This is counterproductive in terms of creating a resilient future for our industries.

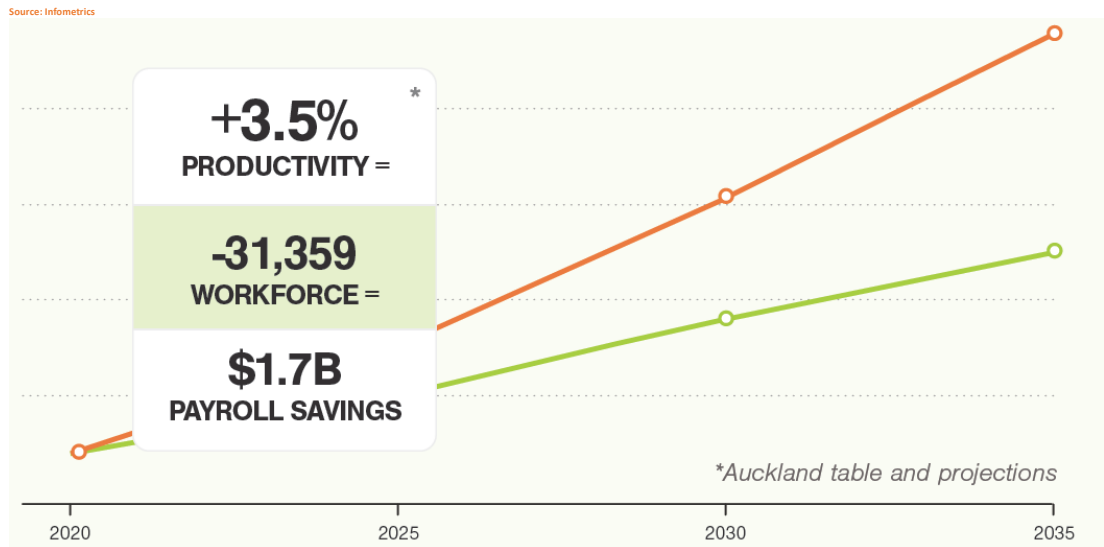
Key findings:

- Our core construction sectors perform below our NZ economy’s average
- The New Zealand economy’s low productivity levels are a poor benchmark for our sectors to aim for
- The growth of the construction and infrastructure sectors has mainly been achieved through more people entering industry and more people working longer hours.
- For Māori Businesses, which place significance on tikanga, the intersect between people/skills development and business improvements provides them with a good platform to approach productivity gains.

Productivity and the opportunity its presents

Historically, the focus of Aotearoa New Zealand’s construction workforce has been on increasing the number of people on the tools. Our future efforts must switch to working smarter and we must look at ways to achieve more with fewer people so we can get the maximum benefit from our available resources.

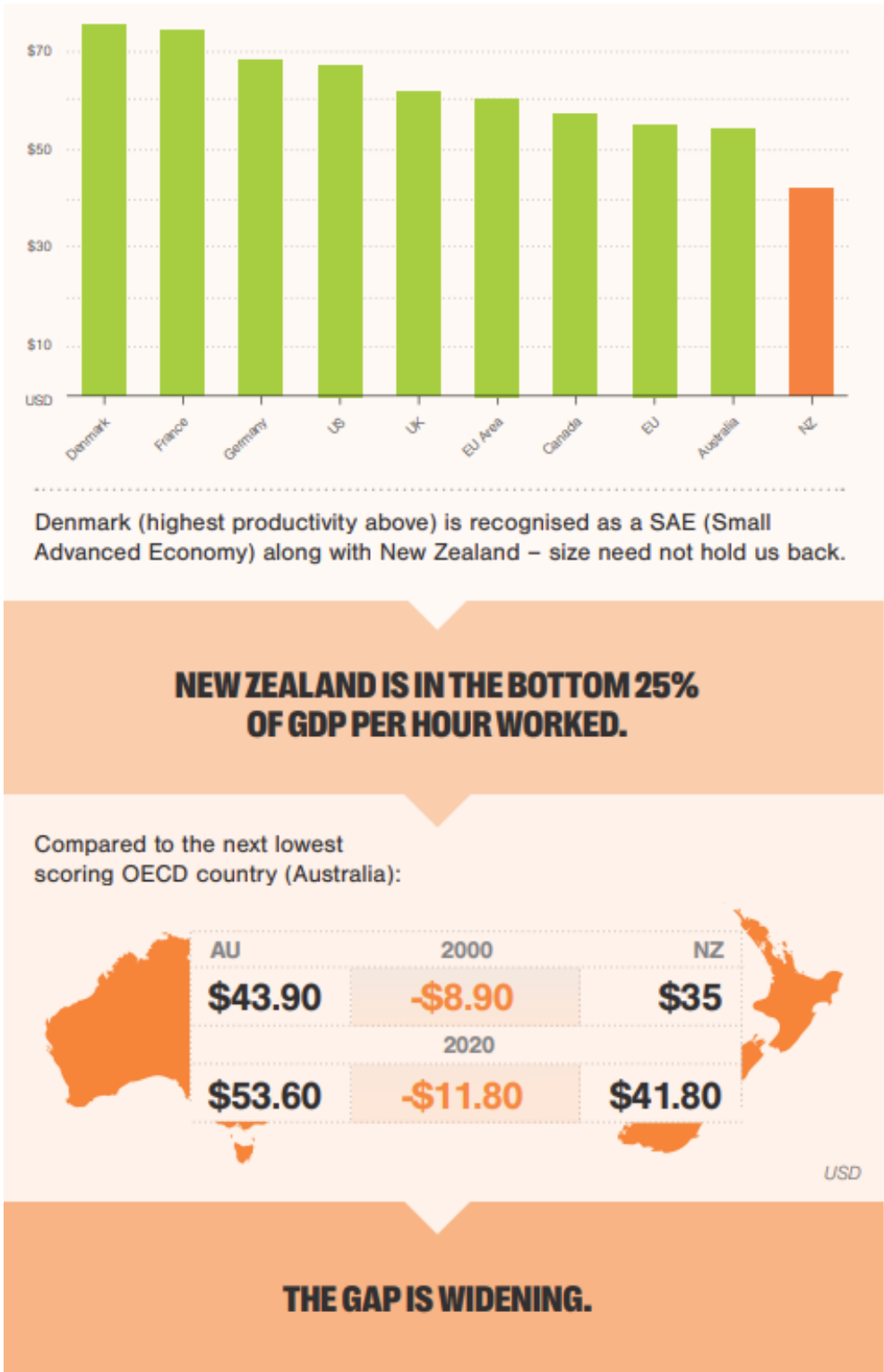
Figure 10: Small changes big results



The results of a modest annual productivity improvement of 3.5% per annum, instead of the previous average of 2.1%.

Figure 11: GDP per hour worked

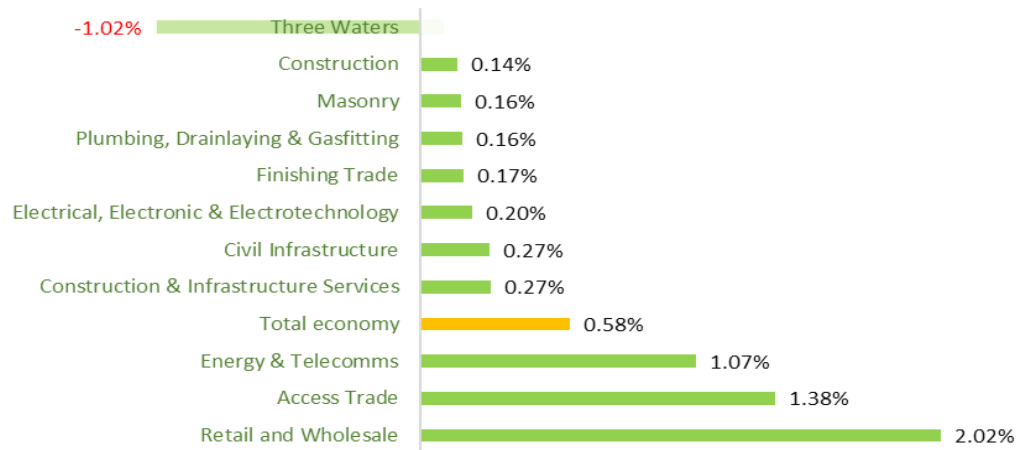
Source: OECD



When considering comparable productivity examples, we need to look not only within New Zealand, but more importantly outside our borders. This graph shows New Zealand’s productivity across all industries based on total GDP generated per hour worked compared against many OECD countries.

Denmark is recognised as a SAE (Small Advanced Economy) along with New Zealand, so this is where to aim – our size need not hold us back. New Zealand is the one of the lowest generators of GDP per hour worked and the gap is widening – improving capability and productivity needs to be part of the plan for Construction Workforce Planning.

Figure 12: Annual change in productivity for 2000 – 2020

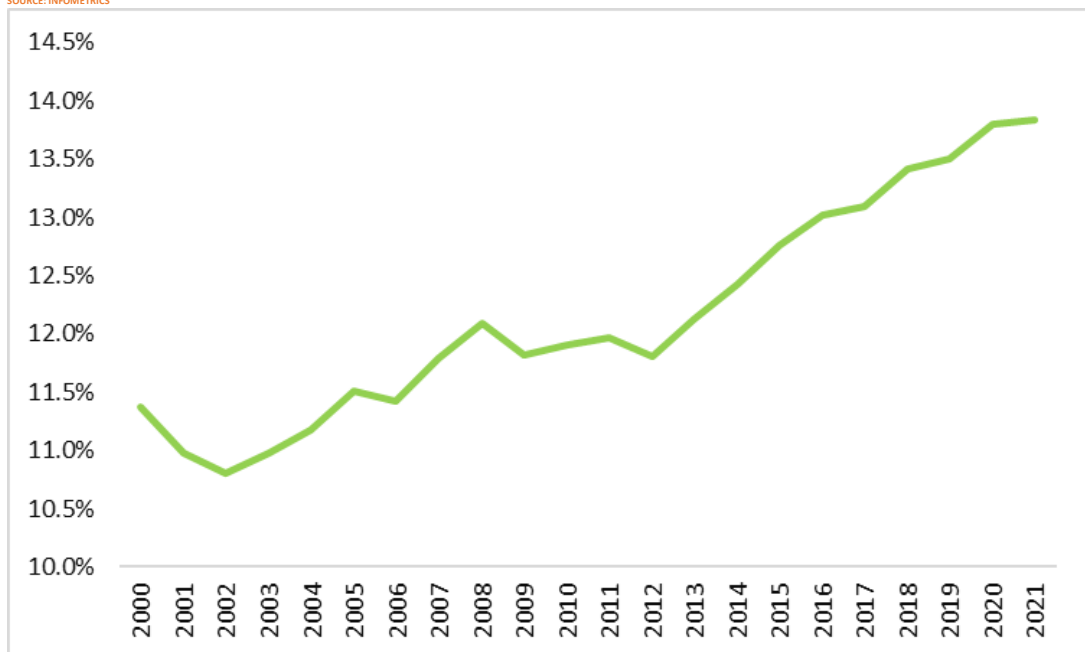


This graph shows the average annual rate of change in productivity every year for Waihanga Ara Rau’s eleven strategic sectors benchmarked against the Total Economy (shown in orange).

The core construction sectors perform below our economy’s average, indicating plenty of scope for improvement.

Figure 23: Construction GDP/total economy

SOURCE: INFOMETRICS



Construction’s contribution to our total economy has been growing since 2002.

The GFC impact affected Construction’s share until 2012 with significant share growth until 2020.

The plateau in 2021 reflects COVID-19 interruptions, supply chain challenges and a tight labour market.

Our contention is that improving productivity is the only long-term hope for a resilient future for the sector. We will talk to this through the report and address how we might look to achieve it in Our Future of Work section.

Figure 13: Construction & infrastructure work more hours

Source: Infometrics

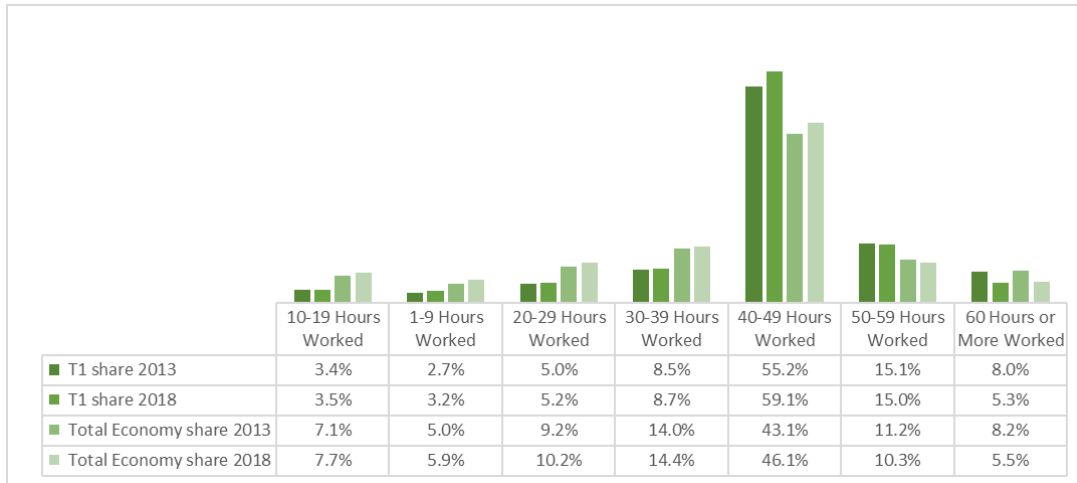
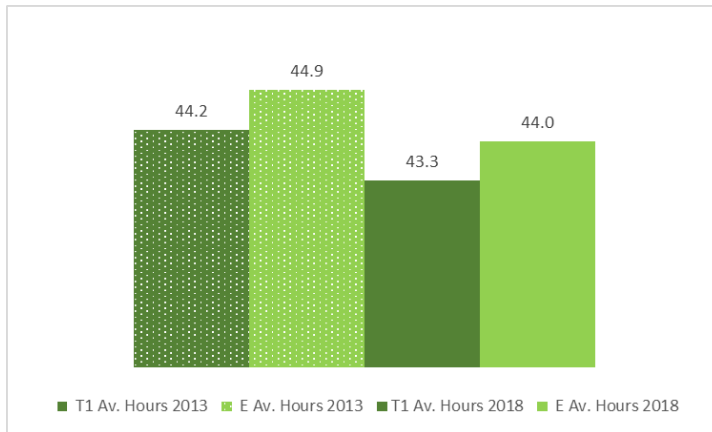


Figure 14: E construction works even greater hours

SOURCE: INFOMETRICS



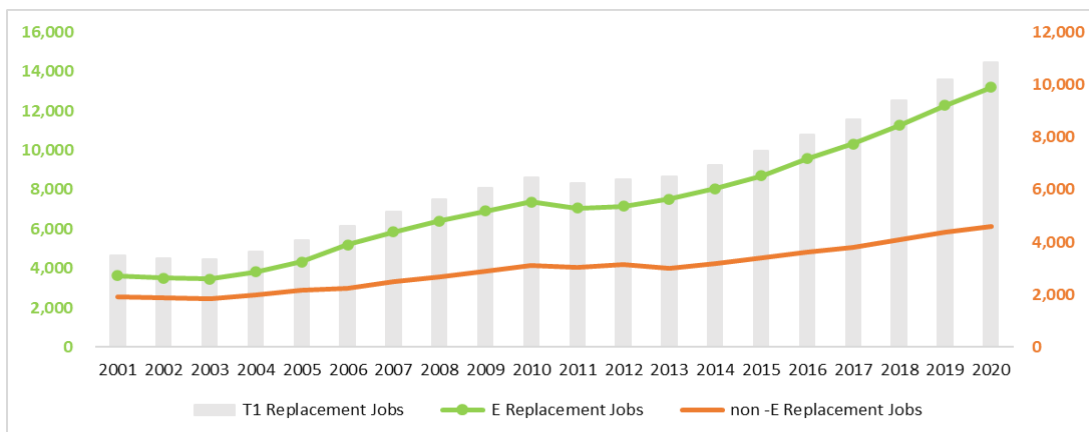
The workforce covered under our T1 Construction & Infrastructure strategic clusters works longer hours than the Total Economy.

The second graph demonstrates that the E classifications work even more average hours than our T1 group.

The productivity we do achieve is typically through working longer hours. A resilient future consists of greater productivity for fewer

hours – we need to learn how to work smarter.

Figure 15: Replacement job trend shows the need to improve retention



The increasing size of the workforce is not the only challenge posed when considering recruitment activity. The graph above shows the growing number of jobs that need to be replaced to meet attrition. Recruitment activity increases costs and typically reduces productivity through downtime caused by employment lead times, induction and training as well as coming to speed with company systems and practices. Keeping attrition rates as low as possible reduces disruption and cost, while maintaining and improving productivity



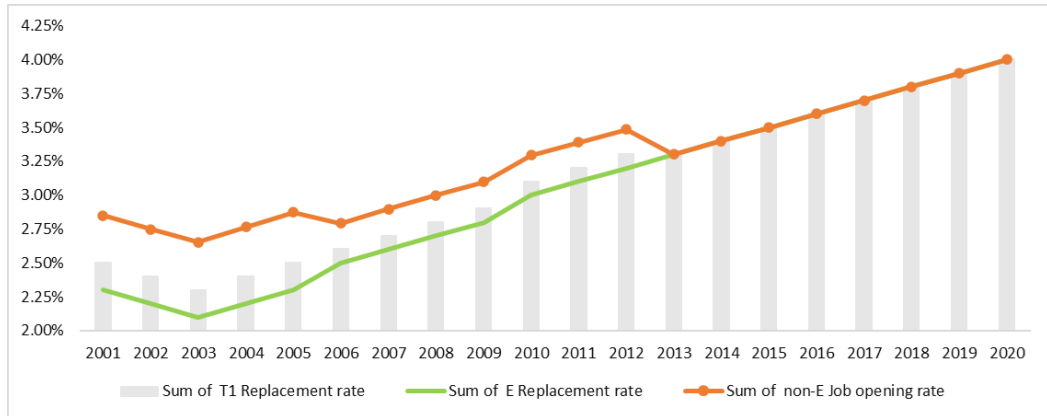
Created by Gregor Cresnar from the Noun Project

Do you feel your sector has a retention issue? If you do is it worse than other sectors?

Click to [Answer online](#) or scan the code below



Figure 16: Retention is falling, replacement jobs are raising



This graph shows the trend for replacement jobs, which for E classifications, has been steadily growing and exacerbating industry concerns over recruitment and retention. Infometrics have forecast a 4.1% replacement job rate across the sector, significantly worse than in 2001.

It is interesting to note that the non-E classifications were higher than the E classifications prior to 2013. Unfortunately, E classifications worsened from 2003 onwards with both classifications now on the same trajectory.

Over time we believe the recommendations regarding raising capabilities and productivity will alleviate this issue. We speak to this in Our Future of Work section.

Māori Businesses

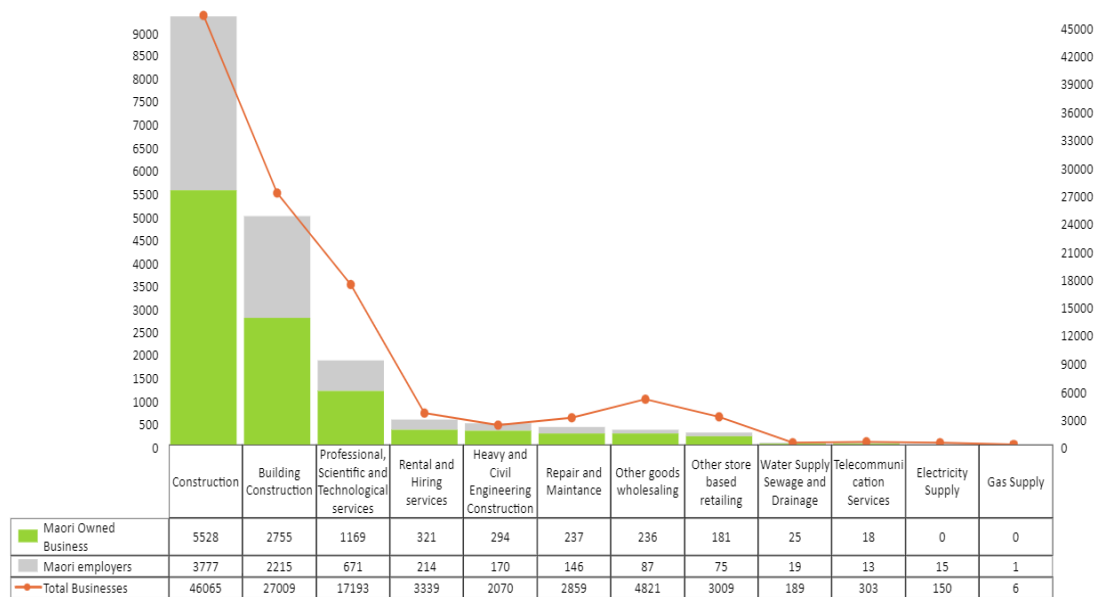
Waihanga Ara Rau is absolutely committed to advancing and improving Māori construction and infrastructure businesses, in particular at the intersect between people/skills development and business improvements.

Early consultation and research indicate Māori businesses often have several similarities, particularly their stated visions and values such as a common reference to the importance of tikanga. Generally, this means there is a desire to be both culturally and commercially successful. We believe this puts Māori businesses in a good place to face many of our key challenges around lifting productivity. More on this will be discussed in section 2 “Future of Work”.



Figure 17: Māori business numbers by definition in construction and infrastructure related areas

SOURCE: Te Puni Kōkiri



A Māori-owned business is defined as a business which meets one or more of the following criteria –

- A business that pays at least 50% of wages to active shareholders, directors or partners of Māori ethnicity or descent.
- A business identified as Māori by Stats NZ.
- A sole trader identified as Māori by IDI ethnicity data or NZ Census 2013 data, earning a non-zero income.

A significant employer of Māori is defined as a business whose employees of Māori ethnicity or descent (as identified by IDI data or the NZ Census 2018) make up an arbitrary proportion of the business’ employees (75%). This definition excludes any business identified as sole traders.

The graph given above demonstrates distribution of Māori owned businesses, significant employers of Māori and Total businesses in Waihanga Ara Rau sector in 2020. This data was collected from Stats NZ IDI. The data presented in this graph came directly from Te Puni Kōkiri and the work they did to produce Te Matapaeroa 2019 <https://www.tpk.govt.nz/en/a-matou-mohiotanga/business-and-economics/te-matapaeroa-2019>. The data from that original piece of work has been ‘sliced and diced’ to gain specific insights. Some key insights are given below:

- In 2020, there were 10,764 Māori owned businesses in our sector which makes up 10% of all the businesses in our sector.
- 7% (7,403) of all the businesses in Waihanga Ara Rau sector are significant employers of Māori.

“The Māori commercial asset base is substantial. Industry leadership is a driving force in many Māori organisations. Being seen at the forefront of industry best practice is a commonly identified goal. Employment statistics reveal that Māori have diversified into construction, retail trade, and the property and business services sectors and are now prominent players. These factors combine to mean that this is a truly exciting time to be a Māori business. Keeping the momentum going by building on current Māori success and investing in Māori potential is a primary focus.”

Hon Parekura Horomia, former Minister of Māori Affairs

Organisational Profiles

Overview

This section looks to illustrate common organisational and industry workforce features across our strategic sectors.

A crucial component of Waihangara Ara Rau’s strategic work will be our ability to provide the strongest possible evidence to support industry and training providers with key insights and a strategic direction towards collaboration. This requires a good understanding of the past and present organisational profiles, structure of the industry workforce and broad future trends (next section) that impact the sectors’ future workforce needs.

Through our “past and present” analysis we find that the organisational profile of the construction and infrastructure sectors continues to be highly fragmented. By this we mean it is dominated by many small firms. A lack of firms growing their market share and minimal consolidation of businesses is believed to be a major reason why our industries are relatively unproductive.

Fragmented sectors and industries are typically less productive, limited by less access to more advanced business skills. Smaller firms often struggle to innovate, adapt new processes and technology, at the same time as developing growth strategies. Retention of skilled staff also often becomes a critical issue for smaller firms.

The last two decades have been characterised by a fast-paced increase of businesses, accompanied by a fast-growing labour force. Given current labour market trends (tight labour market), and a forecasted large future pipeline of work, continuing recent trends are unlikely to solve future construction and infrastructure demand issues. We talk more about this and suggested approaches in the “future of work” section.

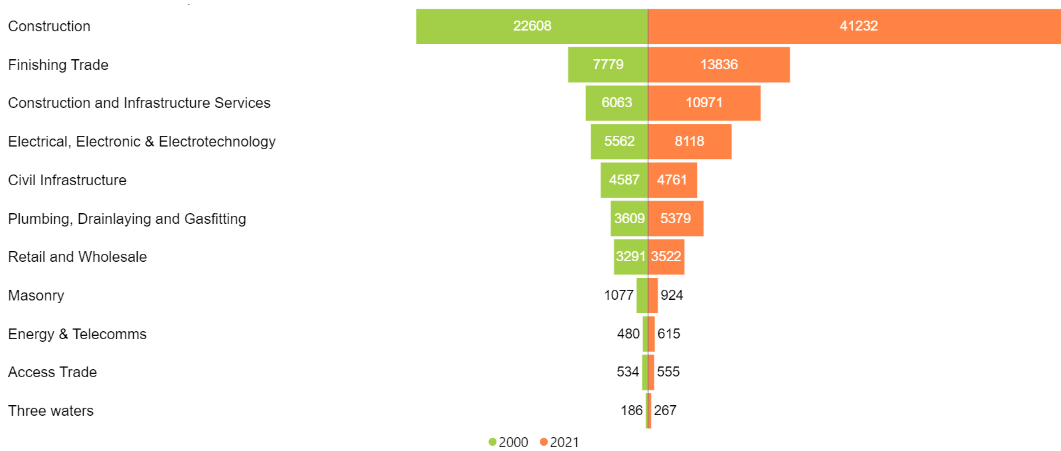
Key findings:

- For most strategic sectors the number of business units has grown significantly between 2000-2021.
- A majority of these businesses are either owner-operated (no employees) or have less than six employees.
- Understanding the organisational structures paints a picture of potential career pathways which can be promoted and help identify best fit for the future.
- Benchmarking key industry workforce structures and features, such as ratios of the ICT, HR and Operations and Project Management workforce, will help identifying opportunities for workforce skills improvements.
- The workforce skills mix is changing across our construction and infrastructure sectors - the gross number of qualified technicians or trades workers is interestingly increasing, while their share of the workforce is declining.

Our business and workforce numbers

The growth in the number of businesses reflects continued fragmentation of the sector.

Figure 18: Business units change 2000 to 2020



The T3 Construction industries comprised of 41,232 businesses employing 145,430 people in 2021, our largest strategic sector.

- Finishing trades are the second largest grouping made up of 13,836 businesses employing 39,549.
- The Construction & Infrastructure Services sector which comprises architectural, engineering and surveying services employs the second largest workforce at 45,202 people employed across 10,971 businesses.
- Civil Infrastructure employs 40,696 across 4,761 businesses.
- Electrical, Electronic & Electrotechnology comprises of 8,118 businesses with a workforce of 28,133.
- Plumbing, Drainlaying, & Gasfitting includes Heating Ventilation & Airconditioning has a workforce of 23,709 employed across 5,379 business.

The rate of change highlights which industries continue to fragment.

- Energy & Telecommunications have a smaller pool of businesses but have expanded by 28% suggesting a trending preference for contractors rather than the larger entities taking on the workforce. Productivity improved by 1.07% p.a.
- Access Trade have stabilised with only a 4% growth in businesses, while workforce grew by over 45%. Productivity improved by 1.38% p.a.
- Construction businesses increased by 82%, workforce grew by 126.8% and productivity improved only 0.14% p.a. – the argument is that continued fragmentation hinders productivity improvement, which means things take longer and cost more, as we have all no doubt witnessed.



Created by Gregor Cresnar from the Noun Project

Have you seen examples in your sector of organisations that apply higher productivity business practices?

Click to [Answer online](#) or scan the code below



Created by Gregor Cresnar from the Noun Project

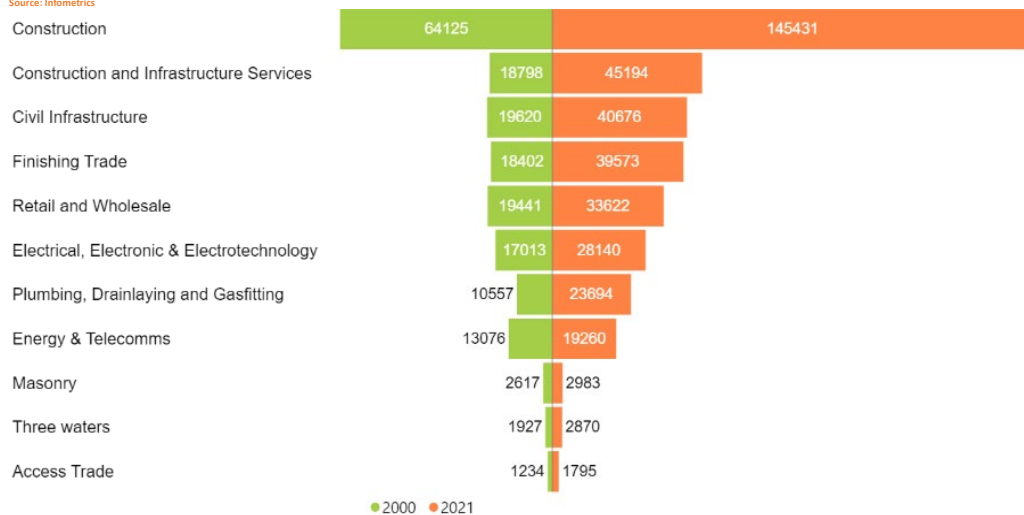
Why do you think the New Zealand construction sector continue to fragment rather than consolidate - i.e. grow in number rather than size of business?

Click to [Answer online](#) or scan the code below



Figure 19: Workforces change 2000 to 2020

Source: Infometrics



Five of our top seven strategic industry clusters have more than doubled their workforce between 2000 and 2020. Going forward this trend poses a problem. We are used to growing our workforce numbers, but the future will be all about growing our capability to do more with fewer people than the past.

In 2000, our combined industries had a Workforce Metric (WM) - proportion of workforce - of 51.2 per 1,000 of general population. In 2020 our combined WM was 76.6 per 1,000 of general population – we grabbed 49.6% more of the workforce pie!

Given current labour market trends, and predictions about the future this scenario is not realistic going forward. We talk more about this in the Future of Work section.

Size of businesses

Figure 20: Construction business size distribution 2020

Source: Infometrics

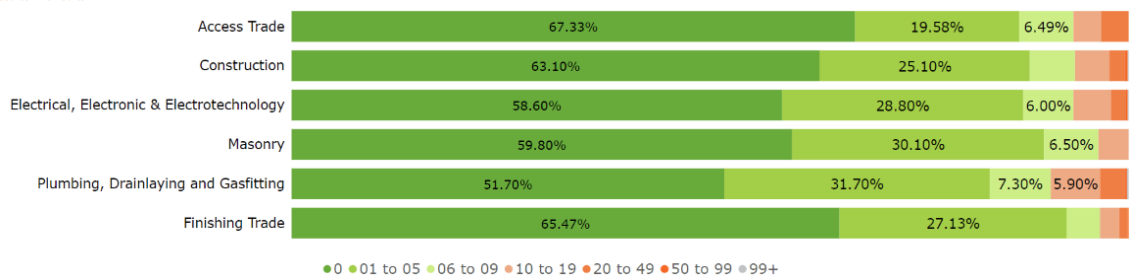


Table 21 Construction business size distribution 2020 by Tier 2 strategic industry group

Source: Infometrics

Size Distribution	Access Trade	Construction	Electrical, Electronic & Electrotechnology	Finishing Trade	Masonry	Plumbing, Drainlaying and Gasfitting
0	67.4%	63.1%	58.6%	65.4%	59.8%	51.7%
01 to 05	19.6%	25.1%	28.8%	27.1%	30.1%	31.7%
06 to 09	6.5%	5.4%	6.0%	4.0%	6.5%	7.3%
10 to 19	3.3%	4.1%	4.5%	2.3%	3.6%	5.9%
20 to 49	3.3%	1.9%	1.8%	1.0%	0.0%	3.0%
50 to 99	0.0%	0.3%	0.2%	0.1%	0.0%	0.2%
99+	0.0%	0.1%	0.1%	0.0%	0.0%	0.2%

Construction - broken down by Tier Three industries

Within our strategic industry clusters, we have some who are dominated by large companies in a consolidated market (Energy & Telco); those who are fragmented with many small players; and many who are sole traders (Electrical & Plumbing). International studies indicate larger organisations are typically more productive as they have access to a broader range of business skills. Other studies have

also identified a lack of management skill in most Small to Medium Business Enterprises (SME’s) and Micro SME’s which leads to lower productivity.

Plumbing and Electrical

While fewer in number, the Plumbing sector businesses tend to be slightly larger. Plumbing businesses have grown slightly faster than Electrical; however, productivity-wise Plumbing had a lower rate of improvement over the 2000 - 2020 period.

Construction and Finishing Trades

Business numbers for Construction have grown ahead of Finishing Trades and tend to be larger. However, when it comes to productivity improvement, Construction managed only 0.14% while Finishing Trades improved by 0.17%.

Access Trade and Masonry

These are our two smallest strategic sectors with a workforce of 1,798 and 2,984, respectively. Masonry experienced a 14% decline in business numbers but increased the workforce by over 14%. Access Trade had a 3.9% increase in business numbers with a workforce increase of over 45%.

With between 88 – 92% of these sectors’ workforces being managed by businesses employing less than 6 people, we can see the challenge that lack of scale presents for productivity improvement.

Infrastructure - broken down by Tier Three industries

Infrastructure has a greater mix of larger businesses compared with T2 Construction and T2 Services, however, 72% - 81% of the businesses have a workforce of less than six. This suggests a high rate of contracting even within the Energy & Telecommunications sector, with a 28% increase in the number of businesses operating in the sector.

Figure 22: Infrastructure business size distribution 2020

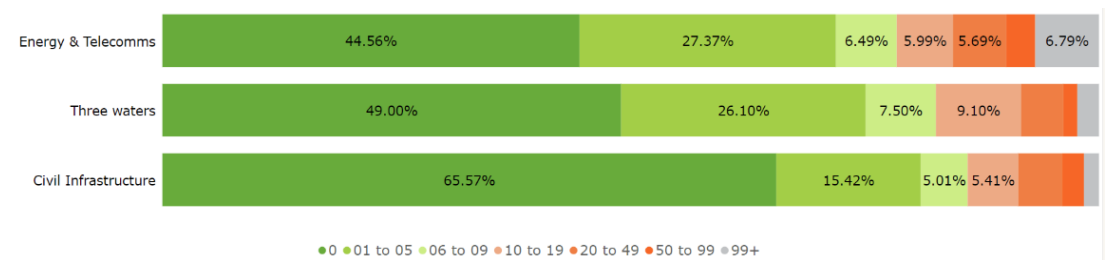


Table 2 Construction business size distribution 2020 by Tier 2 strategic industry group

Size Distribution	Civil Infrastructure	Energy & Telecomms	Three waters
0	65.5%	44.6%	49.0%
01 to 05	15.4%	27.4%	26.1%
10 to 19	5.4%	6.0%	9.1%
06 to 09	5.0%	6.5%	7.5%
20 to 49	4.7%	5.7%	4.5%
99+	1.6%	6.8%	2.3%
50 to 99	2.3%	3.1%	1.5%

Three Waters also saw an upward swing with business numbers increasing 44% between 2000 and 2021.

This compares with only a 4% increase for Civil Infrastructure suggesting that the period was one of consolidation.

Services - broken down by Tier Three industries

Construction & Infrastructure Services covers Architectural, Engineering and Surveying services to the horizontal and vertical construction sectors – essentially a significant part of the planning function for the industry. Small business is still prevalent with 87% of the businesses having a workforce under six.

Figure 23: Services business size distribution 2020

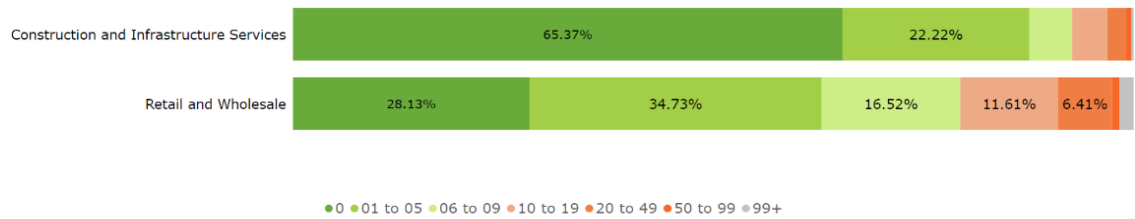


Table 3 Construction business size distribution 2020 by Tier 2 strategic industry group

Source: Infometrics

Size Distribution	Construction and Infrastructure Services	Retail and Wholesale
0	65.3%	28.1%
01 to 05	22.2%	34.7%
06 to 09	5.1%	16.5%
10 to 19	4.2%	11.6%
20 to 49	2.2%	6.4%
99+	0.3%	1.7%
50 to 99	0.6%	0.9%

The workforce grew over 140% for the 21-year period to 2021 making it the fastest growing sector, reflecting the growing complexity and compliance requirements.

Complexity and compliance can hinder productivity. This is an area that warrants further investigation to discover what is already known, recognised as unknown, and what possibilities exist to produce the outcomes required and improve productivity.

Benchmarking provides visibility to negotiate improvement

In our previous reports based on the ANZSIC E classifications (construction and civil infrastructure) (<https://waihangaarau.nz/research/regional-reports>), we have identified capabilities and productivity as the key solution themes for the industry’s reputation, recruitment, and retention challenges.

Given New Zealand’s historically poor (we are in the bottom 25%) productivity performance compared to other OECD countries (see Figure 22), and the tight labour market, the non-E industry sectors (Telecommunications, Energy, Three Waters, Construction & Infrastructure Services, and Retail & Wholesale) are also likely to benefit from understanding the structure of their industry workforce.

Greater understanding will inevitably lead to identifying opportunities for improvement.

Benchmarking requires some time to mature to build patterns and understanding. Over time, the classification of occupations into the categories above will give us a better picture of the structure of our various industries and how they are changing over time. This should include deliberate structural changes that will help achieve the sector resilience we require.

For example,

- ICT is an important component in empowering your workforce by providing the tools to support them do their best work
- HR with a development focus, is important in helping improve capabilities and holding leadership to account on engaging their workforce
- Operations and Project Management provides planning and monitoring to improve efficiency and reduce chaos.

The following tables break down and analyse the workforce into:

1. *Revenue Earners* – expending their time leads directly to billing a customer. This group will typically require the education programmes operated under Waihangara Ara Rau.
2. *Direct overheads* – their time is typically incorporated into the charge rate and is required to deliver the service and goods to the customers, e.g., supervisors, most of who will also likely be educated by Waihangara Ara Rau programmes (for retail this category includes floor staff).
3. *Operations and Project management* – oversee the work (often remotely), price for new work and track cost and time performance. This is a skillset that can make or break an organisation, but only starts becoming feasible as a dedicated standalone function when a company gets to approximately 20 staff. In smaller businesses, this role is handled by the proprietor or their office support. We will talk more about this as we refer to the following tables.
4. *Q&A and H&S* – quality, assurance, health, safety – wellbeing is arguably everyone’s job. Staff fulfilling roles under this category will often come from a vocational education background, but not necessarily.
5. *Logistics* – this covers warehousing and anything transport related. Some companies with large fleets will have inhouse mechanics and Fleet Managers.
6. *Sales & Marketing* – some technical sales personnel will come from our vocational education programmes. Different industries have different weighting of these workforce groups – 16.2% for Retail and Wholesale compared to our Waihangara Ara Rau average of 3.4%. The E grouping has only 1.6% of its workforce dedicated to this function.
7. *Administration* – this is a catchall group for those that do not fit into other specialist categories. This category would ideally be very small whereas it is the largest indirect overhead category (except for SLT and Owners which we will explain below).
8. *Accounting and Finance* – these include Accounts Clerks and Bookkeepers (which make up the bulk of the occupations under this category) as well as specialty Accountant functions which are usually employed by larger companies.
9. *ICT* – Information and Communications Technology roles usually support productivity improvements, and the tables show significant differences between industries under Waihangara Ara Rau.
10. *HR* – Human Resources, again a certain size of business is required to make this economic. Many of the recommendations for improving capabilities will require personnel with HR-type skillsets. Lack of scale will impede progress, so our future needs to look to various routes to achieving scale, from co-operative structures, and the increase of franchise and aggregation models.
11. *SLT & Owners* – Senior Leadership Team (SLT) for larger enterprises and owners for private companies or sole-traders. Given the nature of the industries under Waihangara Ara Rau, it is expected that a fair proportion of this category will be Revenue Earners or Direct Overhead, altering the Direct – Indirect mix slightly.

Table 4: Workforce profile 2020 – construction & infrastructure

WDC T1 Workforce Profile for Construction 'E' and non-E in 2020	'E' workforce	non-E workforce	WDC T1 workforce	'E' workforce	non-E workforce	WDC T1 workforce
Revenue Earners	199,708	44,796	244,504	74.0%	37.8%	63.0%
Direct Overheads	16,791	27,140	43,931	6.2%	22.9%	11.3%
Operations & Project management	1,437	725	2,162	0.5%	0.6%	0.6%
QA & H&S	824	668	1,492	0.3%	0.6%	0.4%
Logistics	6,732	5,236	11,968	2.5%	4.4%	3.1%
Sales & Marketing	4,457	9,528	13,985	1.7%	8.0%	3.6%
Administration	13,908	6,937	20,845	5.2%	5.9%	5.4%
Accounting & Finance	5,795	4,512	10,307	2.1%	3.8%	2.7%
ICT	2,571	8,567	11,138	1.0%	7.2%	2.9%
HR	1,190	1,016	2,206	0.4%	0.9%	0.6%
SLT & Owners	16,387	9,434	25,821	6.1%	8.0%	6.6%
TOTAL	269,800	118,559	388,359	100%	100%	100%

Tier One 2020 Analysis by business workforce structure

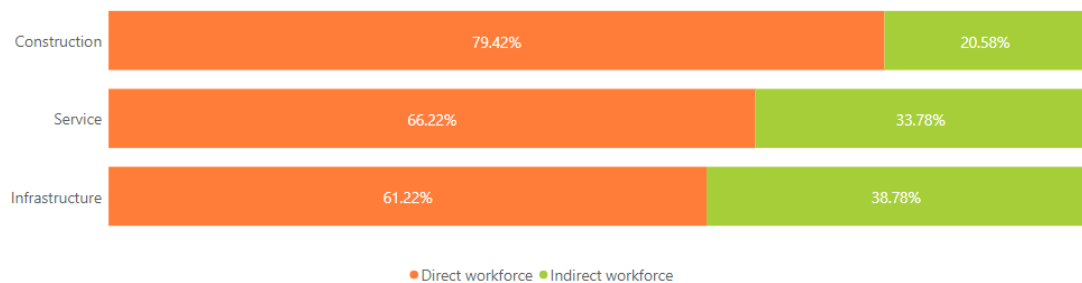
This table highlights the different organisational workforce structures between the E and non-E industries. This also has implications for likely vocational education volumes given that the bulk of our learners fit into the Revenue Earners category. Understanding the organisational structures also paints a clearer picture of potential career pathways which can be promoted and help identify best fit.

Industry Workforce Structure Analysis

These tables are based on 2021 Infometrics data. Occupations have been sorted and shifted to generate the following analysis. Over time, the hope is that we can improve the quality of data capture and arrangement to avoid the need to be interpretative. Full details of the data are available upon request.

It is also important to realise that the ANZSIC industry code is for the predominant part of the business and doesn't easily recognise mixed industry business models. This is evidenced when we do the ANZSIC – ANZSCO crosscut analysis.

Figure 24: 2021 direct and indirect workforce mix tier two



This graph demonstrates the different make-up of the workforce into Direct Workforce – those engaged directly in supplying the goods and/or services to the customer and the Indirect Workforce that work in the overhead functions of the business. A lower direct workforce usually reflects a greater requirement for capital investment and/or a higher proportion of goods supplied in the revenue mix.

T2 Construction has a significantly higher percentage of Direct Workforce and correlates with their typically lower capital investment. In some businesses, supply of product makes up a significant share of their revenue, while other businesses operate in a customer supplied product business model/client base. While the Gross Margin is typically higher for predominantly labour-only businesses, they do miss the opportunity to increase the overall profitability – assuming they have tight credit management.

The key categories of future interest are:

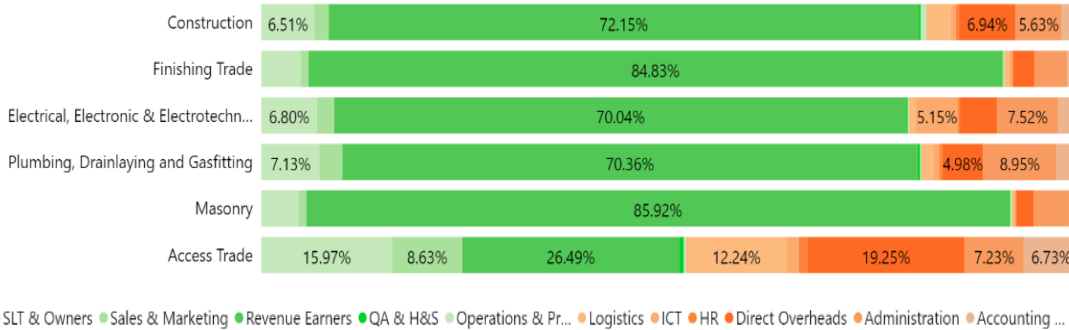
REVENUE EARNERS - Our main source of learners who vary from approximately 74% of the workforce T2 Construction to almost 49% for T2 Infrastructure. T2 Services is skewed because Retail & Wholesale are low in this category (refer Figure T2 Service by T3 sectors).

OPERATIONS & PROJECT MANGEMENT – developing this workforce will be key to lifting productivity, we can already see that T2 Construction is proportionately lower in this category.

ICT – while we may not currently train in this skillset there may be an argument to develop ICT skills specifically for industry systems and practice. These could be post apprenticeship programmes that ensure key ICT personnel have a real understanding of what the systems need to capture and inform on. This may also boost uptake of entry level apprenticeships. Perhaps a base course followed by a specialisation course – something to discuss with industry to test the appetite for such an approach. T2 Construction is proportionately behind Services and Infrastructure suggesting an opportunity for change and improvement. ICT and Operations & Project Management are key drivers of productivity improvement. You can't manage what you can't measure.

HR – here we see that T2 Construction is again lowest at 0.31% compared to T2 Infrastructure at 1.39%; this will largely reflect the difference between a fragmented market for T2 Construction and a more consolidated market for T2 Infrastructure. Boosting productivity improvement over the long term will require input from a specialised development focused HR discipline.

Figure 25: Construction 2021 analysis by business workforce structure



● SLT & Owners ● Sales & Marketing ● Revenue Earners ● QA & H&S ● Operations & Pr... ● Logistics ● ICT ● HR ● Direct Overheads ● Administration ● Accounting ...

Table 5: Construction 2021 analysis by business workforce structure

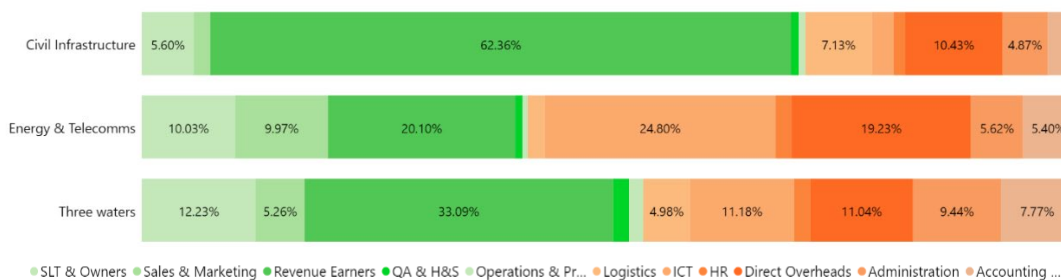
Occupation	Access Trade	Construction	Electrical, Electronic & Electrotechnology	Finishing Trade	Masonry	Plumbing, Drainlaying and Gasfitting
SLT & Owners	16.00%	6.50%	6.80%	4.90%	4.50%	7.10%
Sales & Marketing	8.60%	1.70%	2.10%	0.90%	1.00%	2.80%
Revenue Earners	26.40%	72.20%	70.00%	84.80%	85.90%	70.40%
QA & H&S	0.60%	0.30%	0.10%	0.10%	0.10%	0.30%
Operations & Project management	0.30%	0.70%	0.20%	0.20%	0.20%	0.20%
Logistics	12.20%	2.90%	0.80%	0.60%	0.30%	1.50%
ICT	1.50%	0.60%	5.20%	0.30%	0.30%	0.70%
HR	1.00%	0.40%	0.20%	0.20%	0.00%	0.40%
Direct Overheads	19.30%	6.90%	4.50%	2.60%	2.10%	5.00%
Administration	7.30%	5.60%	7.50%	4.00%	4.40%	9.00%
Accounting & Finance	6.70%	2.10%	2.50%	1.40%	1.20%	2.80%

What is most noticeable in this table is the relatively different structure of Access Trades. We also note that in the previous Figure (ref) Access Trade had the second highest year-on-year productivity improvement for the 2000 - 2020 period.

The comparison between the Electrical and Plumbing Indirect Workforce (any category that is not Revenue Earners or Direct Overheads) is also interesting. Electrical is more invested in ICT while Plumbing is more heavily invested in logistics. This may reflect the HVAC segment of the market which may be more likely to carry stock and have its own transportation department.

Developing a more in-depth understanding of how each segment of Waihanga Ara Rau’s portfolio fits together will improve our ability to serve industry. By sharing what we learn, we will no doubt improve the industry’s own understanding of itself. In turn, this will empower industry to make the gains needed to achieve resilience and excel in meeting future challenges and opportunities – self-awareness is the first step for self-improvement.

Figure 26: Infrastructure 2021 analysis by business workforce structure



● SLT & Owners ● Sales & Marketing ● Revenue Earners ● QA & H&S ● Operations & Pr... ● Logistics ● ICT ● HR ● Direct Overheads ● Administration ● Accounting ...



Created by Gregor Cresnar from the Kōwhiri Project

Why can't ICT be better employed in less capital-intensive sectors to support the workforce in fulfilling its potential?

[Click to Answer online](#) or scan the code below



Table 6: Infrastructure 2021 analysis by business workforce structure

Occupation	Civil Infrastructure	Energy & Telecomms	Three waters
SLT & Owners	5.60%	10.00%	12.20%
Sales & Marketing	1.80%	10.00%	5.30%
Revenue Earners	62.40%	20.10%	33.10%
QA & H&S	0.80%	0.80%	1.70%
Operations & Project management	0.70%	0.60%	1.50%
Logistics	7.10%	1.80%	5.00%
ICT	2.40%	24.80%	11.20%
HR	1.20%	1.70%	1.70%
Direct Overheads	10.40%	19.20%	11.00%
Administration	4.90%	5.60%	9.40%
Accounting & Finance	2.80%	5.40%	7.80%

The vastly different Direct Workforce, as shown in figure 11, reflects the level of capital intensity in each industry. As evidenced by the ICT share; Energy & Telecommunications and Three Waters invest more heavily in ICT to help maximise what they can from their capital investments.

Both industry classifications have a high Indirect Workforce ratio. Unless there are good metrics and expectations to match, it is easy to allow indirect activities to grow beyond what is necessary. Vigilance is required to avoid creating environments where the work grows to fit the capacity without ensuring that it is the right work – that is wasteful work that contributes no value to the customer or results in ineffective compliance activity.

Of the core E industries, Civil Infrastructure is the most capital intensive in the type of plant used, however, it is still highly reliant on people.

The question is – why can't ICT be better employed in less capital-intensive sectors to support the workforce in fulfilling its potential?

Figure 27: Services 2021 analysis by business workforce structure

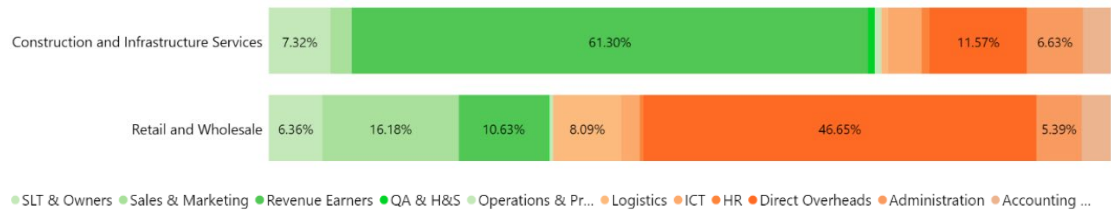


Table 7: Services 2021 analysis by business workforce structure

Source: Infometrics

Occupation	Construction and Infrastructure Services	Retail and Wholesale
SLT & Owners	7.30%	6.40%
Sales & Marketing	2.50%	16.20%
Revenue Earners	61.30%	10.60%
QA & H&S	0.80%	0.10%
Operations & Project management	0.80%	0.40%
Logistics	0.80%	8.10%
ICT	4.00%	2.20%
HR	1.00%	0.50%
Direct Overheads	11.60%	46.60%
Administration	6.60%	5.40%
Accounting & Finance	3.40%	3.50%

Figure 27 and Table 7 looks at the structures of the Retail and Wholesale trade and the Construction & Infrastructure Services (Services) industry, made up of Architectural, Engineering and Surveying disciplines.

We think that Retail and Wholesale fits better with Ringa Hora, Services Workforce Development Council as we have limited qualifications applicable to the sector and the business model is different based on product supply.

The nature of the Services sector is that many of the SLT & Owners group also charge out their time to clients, so the Indirect Workforce is likely to be slightly overstated.

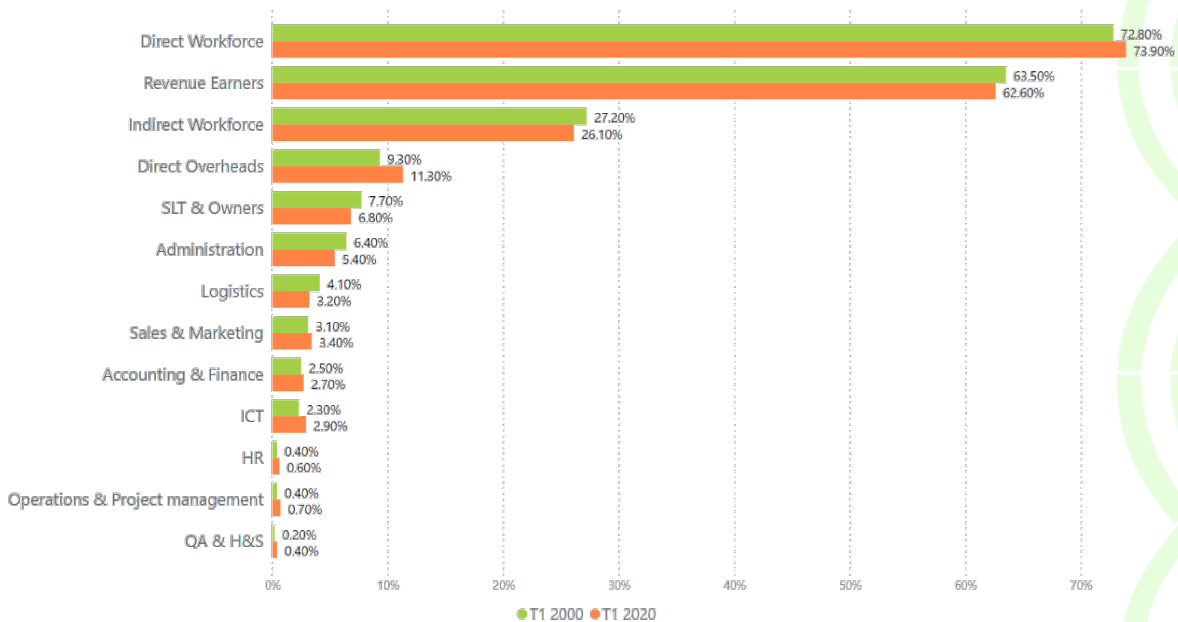
Administration is high at 6.6%, possibly indicating that an increase in technology will improve productivity.

You can see from the Workforce Profile that Retail and Wholesale is quite different having higher Direct Overhead (floor staff), Logistics, and Sales & Marketing people.

Benchmarking requires some time to mature to build patterns and understanding. This is just a start

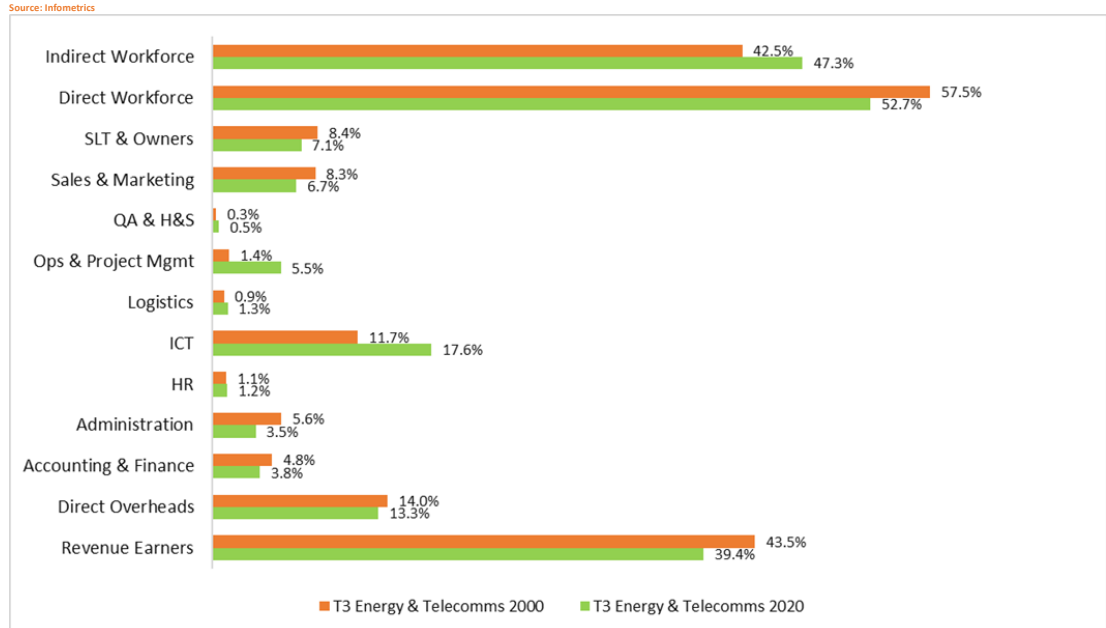
Workforce Profile Comparison for Tier One and Energy & Telecoms 2020 to 2000

Figure 28: Tier one workforce profile change 2000 - 2020



While the Direct Workforce has increased from 72.8% to 73.9% this shift has been driven by an increase in Direct Overheads to 11.3%, Revenue Earning workforce has decreased marginally to 62.6%. Better ICT can assist with improving span of control (the number of people that can be successfully supervised) which should help decrease Direct Overheads workforce.

Figure 29: Energy & telecommunications workforce profile change 2000 - 2020

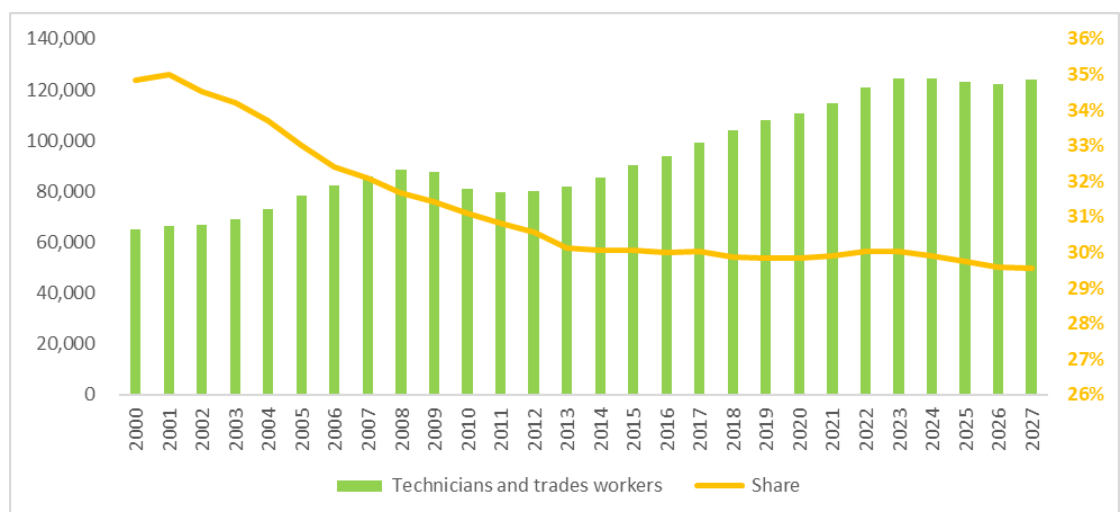


Here we see how the workforce profile can change over time. Energy and Telecommunications have invested their workforce into Operations & Project Management (from 1.4% to 5.5%) and ICT (from 11.7% to 17.6%). Productivity has improved by an average of 1.07% per year from 2000 to 2020, compared with our Total Economy average of 0.58% p.a. while the Workforce Metric has increased by 20.3% compared with 51.8% for T1 Construction, Infrastructure, and Services. The Direct Workforce has dropped from 57.5% to 52.7%.

At face value, they look like positive changes except that we know New Zealand tends not to perform well in productivity improvement compared with others in the OECD. Further international industry-specific comparisons would enable us to have a greater understanding of the remaining potential.

Workforce skill-mix is changing

Figure 30: Technicians and trades workers workforce is growing but its share of the construction workforce is shrinking



Created by Gregor Cresnar from the Noun Project

Is the changing skill-mix a good or bad thing?

Is it happening by chance or design?

[Click to Answer online](#) or scan the code below



Figure 30 shows the trend in number employed and share in T1 Construction, Infrastructure & Services for roles classified as qualified technicians or trades workers. Interestingly, while the gross number of workers is increasing, the share of the workforce is declining.

What we need to find out about this trend is whether it's by design or happenstance and the reasons why. Following recent commentary on the state of the industry and its widely experienced retention and recruitment challenges, it may not be unreasonable to surmise the reason is not by design. But rather difficulty recruiting or insufficient offering of apprenticeship roles, with employers relying on others in the industry to offer those training opportunities.

Table 8: Top 12 occupation classifications

Source: Infometrics

Top 12 Workforce by Occupation by WDC skills	WDC T1 C, I & S	Total economy	Outside WDC	Outside WDC
Carpentry	58,091	71,674	13,583	19.0%
Planning	23,656	33,832	10,176	30.1%
Electrical	22,096	31,587	9,491	30.0%
Plumbing	16,541	22,703	6,162	27.1%
Finishing	10,817	11,605	788	6.8%
Civil Infrastructure	8,075	12,626	4,551	36.0%
Concrete	4,345	4,898	553	11.3%
Telecommunications	3,875	5,378	1,503	27.9%
Roofing	3,672	4,086	414	10.1%
Energy	2,936	3,761	825	21.9%
Access	3,315	4,850	1,535	31.6%
Brick & Masonry	2,307	2,834	527	18.6%

The Top 12 Occupation groups represent almost 42% of the total T1 Workforce.

This table also shows the share of these Occupation groups that are employed in industries outside the scope of Waihanga Ara Rau, e.g., 19% of carpentry occupations are employed outside our industries.

In educational terms we still need to cater for this contingent.

There are other considerations as well, such as Planning having a percentage of the workforce credentialed via university degrees and diplomas, again outside Waihanga Ara Rau's remit.

Table 9: Top 3 occupation classifications earning qualifications under other Workforce Development Councils

Source: Infometrics

Top Ranked Workforce by Occupation by Food & Fibre skills	WDC T1 C, I & S	Total economy	Outside WDC	Outside WDC
Landscape Gardener	3,296	4,471	1,175	26.3%
Fencer	2,305	3,141	836	26.6%
Industrial Designer	870	2,129	1,259	59.1%
Sub-total	6,471	9,741	3,270	33.6%

The next table identifies Occupation groups that work ostensibly in Construction and Infrastructure but gain their qualifications through Muka Tangata, the People, Food & Fibre Workforce Development Council.

Fibre Workforce Development Council.

Further understanding of all these types of implications is necessary and will form part of our future early work.



Created by Gregor Cresnar from the Noun Project

Why do you think the share of qualified technicians or trades workers is declining across our construction, infrastructure & services sectors? Are there any good reasons other than recruitment and retention challenges?

[Click to Answer online or scan the code below](#)



3. Future of Work

Waihanga Ara Rau believe a key part of the sectors' future transformation will be closely linked with improving the capability to do more with fewer people than in the past. Our aim is to work closely with industry to identify and build skills and capabilities that feeds into and enables organisations to grow and become more productive.

The future of work has some known drivers:

- technology, change is expected to displace between 13% (OECD) and 40+% (NZIER) of roles within the next 20 – 30 years
- emissions reduction, legal obligations are increasing as we chase targets to mitigate global warming
- our communities are currently getting older and more diverse, this will need to be reflected in our workforce
- current immigration settings will likely see a change in our population growth and access to imported capability
- comparatively low productivity affects our competitiveness and quality of life
- as a country we have backlog of infrastructure investment including basics like housing and water.

Each of these known drivers will introduce the need to handle significant change, some predictable and some yet unforeseen. In this section we will cover the predictable change that we need to give thought for how best to prepare and capitalise on the opportunities that change inevitably presents.

Vision for the future workforce

As mentioned in the introduction, devising a national multi-industry strategy is more complex than developing a plan for a single organisation. The closest thing we have to a vision comes from the Construction Transformation Plan which we have amended to include Infrastructure:

“A high performing construction and infrastructure sectors for a better New Zealand.”



The goals outlined to achieve this were stated as:

- Increase productivity
- Raise capability
- Improve resilience
- Restore confidence, pride, and reputation.

We see the ultimate goal as Improving Resilience – “a sector with strong, sustainable businesses with the capacity to innovate and adapt to change and disruption.” Increasing productivity and raising capability are the ‘how to’ elements – achieving these two things will build resilience.

The restoration of confidence, pride and reputation are a by-product of raising capability and improving productivity as they create the conditions necessary to achieve them.

Notice what we did there – we switched productivity and capability around. Raising capability drives productivity improvement. Understanding inter-relationships of component parts is important if we wish to deliver the best outcomes.



Raising capability comes first – and that’s all about people as they are the key component. This is where workforce training and development fit in – and why we are having this conversation.

Vision is about clearly painting the picture for our future and sets out the path to get there – clarity is vital for success. Just think about things that have happened in your life and you will realise the truth of that statement.

Self-awareness and understanding others are key to our success and we restate below what we said in our regional reports.

For many this will mean learning new systems, interpersonal dynamics, and problem-solving skills, all of which will require thoughtful incorporation into our future education programmes and industry practices, so akōnga/learners have elementary readiness from the start. It is essential that industry has access to the right people, with the right skills, at the right time. These skills will not only enhance productivity, but also deliver improved wellbeing, health and safety standards and industry reputation.

We understand and appreciate that change can be overwhelming because all change involves a stretch – the need to reach beyond our comfort zone. It means embracing the challenge of learning new things and having the confidence to action them. Sustained change is perpetual learning, trying, succeeding, trying, failing, learning, trying – the end is never reached, and perfection does not exist, but striving to do better is the constant.

Innovation happens through action – you will not always get the result you want, so mitigate the risk and do it, the worst is that you learn something you can use later.

“Done is better than perfect” - Mark Zuckerberg

But first, what does the past tell us about the future of work? Analysing our past and future enabled us to determine what the key drivers of workforce demand are for the future:

- Change in population
- Response to climate change
- Change in Construction GDP compared to change in GDP
- Improved productivity

Change in Population and Workforce

Overview

Changes to our population and new demands on our future workforce is and will continue to be at the heart of our workforce development plans. This section reflects on the continued importance to develop a diverse, equitable and inclusive (DEI) workforce, uplifting and creating a level playing field for Māori learners and balancing migration flows. We also illustrate and question the sustainability of our sectors' workforce growing exponentially compared with total New Zealand employment.

Key findings:

- The ability to attract and develop talent from a wider and more diverse talent pool is critical to our industries' future
- We will align and embed the Construction Sector Accords DEI roadmap recommendations and goals
- We will support Mahere Whai Mahi Māori - The Māori Employment Action Plan
- We believe there is a great opportunity, based on key Māori businesses characteristics, for these Māori businesses to be early adopters and developers of our Transformational Change Models (models discussed in its own section below)
- We are vulnerable to immigration policy and domestic conditions that affect people's desire to leave or join the country
- Our construction, infrastructure and services sectors are all forecasted to increase their share of the total employment pie. We question its sustainability.

Workforce should reflect their community

Waihanga Ara Rau is committed to a sector wide approach towards diversity, equality, and inclusion (DEI). Our diversity lens includes women, Māori, Pacific Peoples, migrants, and speakers of English as a Second Language (ESL), disabled, LGBTQ+, neurodiverse, young and older workers.

The ability to attract and develop talent from a wider talent pool is critical to our industries' future ability to raise capability and develop a workforce that can service the existing and growing pipeline of work. However, DEI is not only about the number of workers available. Importantly, industries' ability to effectively respond to the critical challenges discussed in the segments below, including lifting productivity and responding to emission reduction needs, has been proven to be supported by more diverse and inclusive industry workforce, management, and ownership structures.

Like most of our work, this requires co-ordination and accountability across industry, training organisations and our various industry/government led initiatives. With that said, we are pleased to align with the Construction Sector Accords yearlong sector-wide DEI project, culminating in the recently produced [Construction Diversity Roadmap Report](#). The vision of this work is as follows:

"A sustainable, diverse and inclusive workforce where everyone can see a good career pathway in construction."

Our own work will seek to support and embed the roadmap's 2025 recommendations and goals:

- There will be a noticeable increase in the number of sector and organisation leaders who make DEI a priority through investing in their own personal learning.
- There will be a noticeable increase in the number of organisations who have implemented formal systems and DEI programmes.
- On average, construction organisations will understand how to bring more diversity into their workforce and how to be mindful of DEI in career development initiatives, and the way their everyday systems and processes apply differently to different people.
- Bicultural competence will have grown, enabling more dynamic relationships with Māori, and a marked increase in Māori representation across the sector at all levels.

- Inclusive collaboration and psychosocial safety will have been emphasised in team cultures and through all aspects of site management.

Supporting Māori learners

As mentioned earlier, creating a level playing field for Māori is a basic obligation of Te Tiriti o Waitangi. Waihanga Ara Rau will be working closely with iwi, industry, training providers and Māori businesses to creating lasting change for current and future generations of Māori.

Just like with the broader diversity, equity, and inclusion initiatives, we will collaborate and align with the recently released Mahere Whai Mahi Māori - The Māori Employment Action Plan. Our work will have a main focused around:

- Explore the changes needed for the employment, education and training (EET) system to be effective and equitable for Māori
- Improve education outcomes for Māori learners
- Improve education provided on mātauranga Māori and te reo Māori
- Improve data collection on Māori participation in employment, to accurately monitor whether Māori are taking up opportunities
- Ensure the Reform of Vocational Education (RoVE) works for Māori
- Design tertiary education and system settings that will respond better to, and improve outcomes for, Māori learners and communities (MoE)

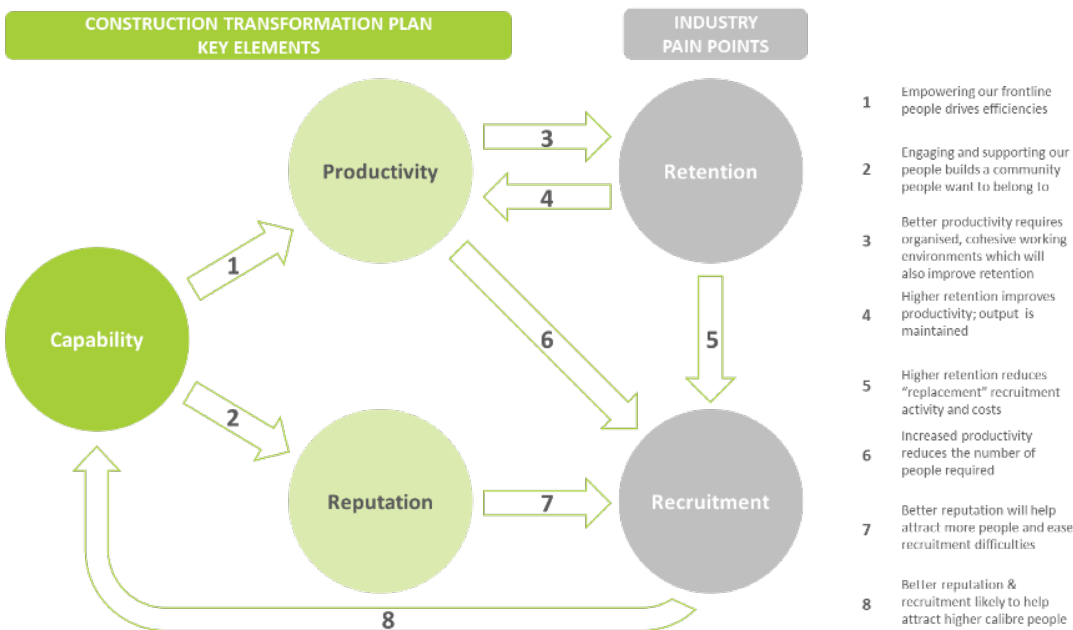
<https://www.mbie.govt.nz/dmsdocument/18759-te-mahere-whai-mahi-maori-maori-employment-action-plan-english>

Māori businesses

As discussed in section one, we believe a common characteristic of Māori businesses is a focus on tikanga and a whānau-based environment. Tikanga values include the importance of Te Reo Māori (language), whenua (land), and in particular whānau (family and extended family group).

We believe that Tikanga and the pride and value it puts on “place” and “people” is also an imperative part of any positive change process. As such, we are very interested in working with Māori Businesses to test assumptions and explore culturally relevant productivity and capability improvement models that are distinctly Māori based.

You will find the productivity and capability models discussed under our Transformational Change Models section later in the document. However, as an example, the Optimising Workforce Capacity model’s diagram is attached below.



The Optimising Workforce Capacity diagram illustrates how businesses that empower its people and builds a positive community can improve productivity and reputation, leading to better retention and recruitment outcomes, which ultimately lifts the business’ capability for the future.

Population and Immigration

Historically our population growth has occurred through positive net migration. Like many developed countries New Zealand’s birth rate is declining with Births per Female falling from 2.02 in 2000 to 1.61 in 2021. Our aged population continues to grow proportionately larger with our working age population likewise increasing in age.

Other key migration characteristics and trends

- New Zealand is ranked fourth for the proportion of our population that lives abroad.
- We rank number one in terms of temporary migrant inflows as a percentage of our labour force for the period 2010 to 2016.
- Permanent Residence visas have trended downwards since around 2006,
- Work Visas had been on a sharp upward trajectory until Covid-19.
- The proportion of migrants holding tertiary qualifications is higher than New Zealand-born kiwis.

New Zealand would appear to be a mix of extremes, some good, some not so good. What conclusions can we draw from what we know?

We are vulnerable to immigration policy and domestic conditions that affect people’s desire to leave or join the country. We also have historically had a large portion of migrants who work and stay for short periods (in career development terms).

Our regional Economic Development Agencies (EDA’s) each provided input to determining their respective region’s population forecast for 2035. The projected total population for 2035 is estimated to be approximately 5,868,000. This fits within the ranges estimated by Statistics New Zealand

Most regions have made assumptions based on achieving population growth to drive economic demand and given that our natural increase is on the decline, immigration is an important component for workforce planning and development, economic growth, and societal well-being – healthy societies tend not to shrink.

Workforce and Workforce Metric (proportion of workforce) - historic and projection

Workforce Metric (WM) – our proportion of the total workforce

The Workforce Metric (WM) metric illustrates our sectors’ workforce dynamics and shows us that the construction workforce has grown exponentially, from 33.3 in 1,000 people 20 years ago to 53.5 in 1,000 today.

Figure 32: Workforce Dynamic 2000 – 2020 - 2035

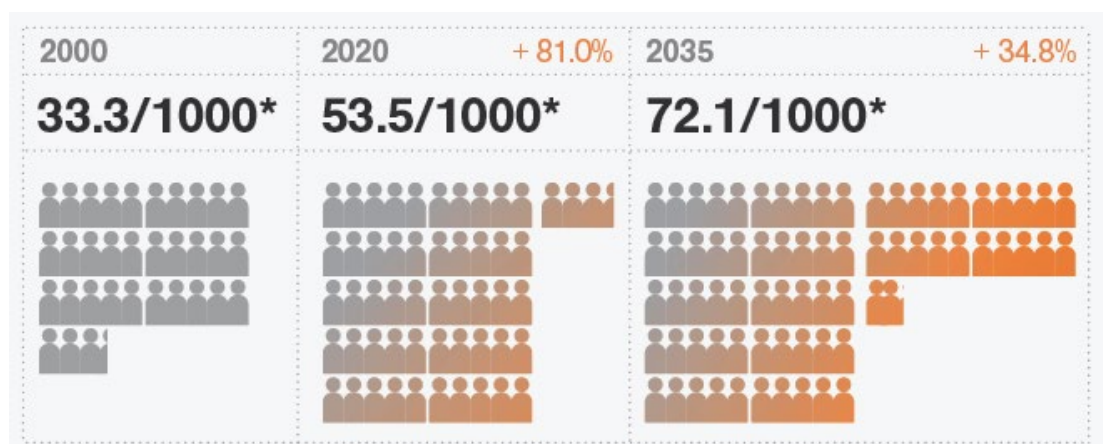




Figure 32 shows our workforce, population, and WM trend from 2000 to 2020 and our forecast for each in 2035. The WM represents the workforce expressed as a number per 1,000 of general population. Unlike the workforce number, the WM is correlated to population change providing insight into the share of the workforce we plan to have.

As highlighted by the growing Workforce Metric we are forecasting an increasing share of the employment pie.

Given what we are predicting about population and labour market conditions in general, how realistic is it for us to forecast an ever-increasing share of the labour market pie?

Method

The forecasting to 2035 was achieved by two methods. E classifications were formulated regionally with input from EDA staff using a formula that utilised population, change in construction GDP, change in GDP, and the rate of change productivity per annum.

This formula was created as part of our Regional Construction Workforce Planning and Development Project and reflects the drivers identified for E Construction growth.

The E classification industries are far more volatile than the non-E classifications which indicates they have different drivers for workforce growth. In time, we hope to identify far more about all industries within Waihanga Ara Rau's purview, but for this report, we have adopted an interpretation-based forecast for non-E industries using 2000 – 2020 history and Infometrics' forecast at Level 2.

Climate Change Response – a Reality of the Future

Overview

The national climate change response agenda is real and will without a doubt affect our industries in many ways. We highlight some of these ramifications and how our industries, with the right knowledge and skills, will make a positive impact in key areas such as waste and energy usage reductions.

Key findings:

- The government's first Emissions Reduction Plan, will increase regulation aimed at reducing emissions in line with our international commitments
- This will predominantly affect our planning and design disciplines in the early stages, but changes will ultimately affect how all parts of the construction and Infrastructure sectors do things and what it uses.
- For the upcoming year, the focus is going to be on increasing knowledge and awareness to build an understanding of the importance of action and what some of that early action should be.
- Key to executing an emissions reduction strategy will be an engaged, knowledgeable and empowered workforce that understands why we do things and the importance of how we do things.

Emissions Reduction

This year the government released its first Emissions Reduction Plan, as required under the Climate Change Response Act 2002. The report outlines 65 pages of actions some of which directly affect our sectors, a result of which will be increased regulation aimed at reducing emissions in line with our international commitments.

[Aotearoa New Zealand's first emissions reduction plan: Table of actions | Ministry for the Environment](#)

Just some of the ramifications are listed below and they predominantly affect our planning and design disciplines in the early stages – but the changes will ultimately affect how we do things and what we use.

- New structures will need to comply with the changes in regulations which are yet to be detailed, but have been clearly signalled e.g., skill standards will need to be updated (Action3.1.2),
- Planning and Infrastructure (Actions 7.1 – 7.7) consent processes will likely include a requirement for embodied emissions of new buildings to be included as part of the consenting process,
- waste reduction through regulations that will obligate businesses to separate out specified organic materials, including construction and demolition waste, targeting wood. (Action 15.3.3) the development of a circular economy which currently has lack of scale in both market and infrastructure (Actions 9.1 – 9.7)
- significant implications for Transport which will involve changes to planning guidelines and infrastructure to promote walking, cycling and public transport. Auckland and Wellington are mooting the introduction of congestion charging but is contingent on the Government deciding to allow it (Action 10.1.3). This could work in favour of our industries if the charge is less than the time saved in travelling on less crowded roadways.
- Energy and industry (Chapter 11) has five focus areas including the decarbonisation of industry and the development of a mandatory energy and emissions reporting scheme for large energy users. This speaks to another focus which is use energy efficiently and manage demand for energy which has implications for specifiers and retailers. The logical endgame is to price low efficiency into products so the whole of life cost is recognised at the specification or purchase point.

- Building and construction (Chapter 12) focuses on reducing embodied carbon (whole of life carbon footprint from extraction to disposal) of construction materials, accelerating the shift to low-emissions buildings, improving buildings energy efficiency.

For the upcoming year, the focus is going to be on increasing knowledge and awareness to build an understanding of the importance of action and what some of that early action should be. This needs to reach the clients of industry as much as the industry itself.

A survey undertaken on behalf of BRANZ showed 58% of respondents thought that education was best handled as part of the professional development regime through workshops, seminars, and trade talks. A combination of online, in-person and education on the jobsite were the most favoured delivery channels.

The survey identified and rated the following areas for skills and knowledge development:

- Knowledge of how your work connects with the work of other trades (96%)
- Knowledge of general building, architectural & engineering principals (93%)
- Overall understanding of sustainable construction strategies (90%)
- Understanding the impact of greenhouse gas emissions (84%)
- Broad awareness of climate change (82%).

In addition, it will be important to share how we might make a positive impact under the following categories:

Waste Reduction

“Construction and demolition waste makes up 40-50% of New Zealand’s total waste going to landfill and cleanfill.”

Reducing waste will rely on a smart design discipline that questions the utility value against wasteful design, and valuing design simplicity that optimises material utilisation. Design that makes the most of standardised offerings also reduces costs and waste.

Building practice can also either encourage low productivity* and waste by the disciplines and standards it upholds. For example, ensuring that openings for doors and windows are square and dimension-appropriate means that doors and windows can be ordered in advance of construction, reducing construction timeframes and likelihood of incorrect size due to more streamlined and accurate fabrication disciplines which in turn reduces rework, waste, and schedule delays.

*Productivity refers to the value of output generated by the value of inputs. Aside from waste, construction practices can be ill-disciplined about scheduling, time management, as well as poor co-ordination among the trades which invariably work in multidiscipline environments. It’s the lack of manufacturing-like process and logistical co-ordination.

Consume less energy

Broadly speaking, energy consumption is determined in three stages:

Design

Smarter design will include materials with a lower life-cycle carbon footprint which includes waste inherent in the design and products included in the specification for the build, as well as the ultimate disposal impact when the construction asset is retired.

Construction

Workplace practices will need to be cognisant of the types and usage of energy during the construction process. On site energy is usually the least contributory element of on-site carbon emissions but shouldn’t be overlooked.

Operation

Energy consumption during the lifetime of a construction asset is considerable. This means using energy efficient appliances and systems is important. This will require education of practitioners and customers about selecting value over price.



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from the Noun Project

Do you know what is expected from your business in terms of becoming compliant with new and future emission reduction regulations?

[Click to Answer online](#) or scan the code below



Fewer KMs

Better planning will reduce unnecessary trips reducing costs, improving time management, resulting in higher productivity and profitability – and helping to save the planet.

Green Building

BRANZ has developed a simple two-page summary outlining the requirements to achieving Building lower-carbon homes. This outlines the elements required to achieve a low-carbon accommodation structure.

Guidelines speak to the following considerations when planning:

- good orientation
- high levels of insulation
- low carbon materials
- compact floor area
- external shading
- waste minimisation
- water efficiency
- thermal mass
- efficient space heating and cooling
- energy efficient appliance
- efficient water heating
- high quality windows.

<https://www.buildmagazine.org.nz/articles/show/reducing-new-home-emissions>

Some other resources you may find useful:

Zero carbon tools link: <https://www.branz.co.nz/environment-zero-carbon-research/>

Waste link: <https://www.branz.co.nz/sustainable-building/reducing-building-waste/rebri/>

Low carbon resources: <https://www.branz.co.nz/low-carbon-resources/>

A lot of the actions to effect emissions reduction are common sense or already underway. What makes the difference is ensuring that your business and business practices are updated to at the very least to become compliant with the new regulations which we be implemented over the next two or three years.

Workforce Development implications

To execute an emissions reduction strategy successfully requires organisations and businesses to have an engaged and empowered workforce that understands why we do things and the importance of how we do things.

Our future will rely on inter-disciplinary teams that can collaborate effectively and efficiently. Incidentally, these are the same requirements for improving productivity – both elements of an Operations Excellence strategy.

Elementary training requirements that are necessary to build capability to achieve a collaborative workforce are outlined below:

Learning about ourselves and others 101

Interpersonal Dynamics including learning and communication styles, elementary working through collaborating with others, customer service skills, elementary dealing with problems.

Construction and Infrastructure 101 our role in the ecosystem

Understanding Construction & Infrastructure’s role in society, how your discipline fits within our ecosystem, projects, and business. What we contribute, the importance of what we do and some of the opportunities available as careers progress. An introduction to the strategic direction for the industry, the challenges, and opportunities – share the vision.

Achieving the greatest industry reach will require the collaboration between peak organisations, BRANZ, Te Waihanga (New Zealand Infrastructure Commission), Waihanga Ara Rau, Regional Skills Leadership Groups, Te Pūkenga, The Construction Accord, and ConCoVE. This will be an important test to demonstrate how effectively the new support structure can deliver.



Created by Gregor Cresnar from the Noun Project

How well positioned is your business / industry in becoming compliant with new and future emissions reduction regulations?

Click to [Answer online](#) or scan the code below



Economic Analysis – Our Future

Overview

The New Zealand Construction and infrastructure is a challenging place to be. Excess demand through the pipeline of work is growing by the month (see Workforce Information Platform (WIP)), productivity is lagging both New Zealand and international levels, and uncertainty due to our sectors cyclical “boom and bust” swings, has long held our industries back

We illustrate how important it will be for our industries to overcome these challenges and turn them into opportunities in the future. A key to overcoming challenges is having good information and market intelligence. Waihangara Ara Rau aim to add value to our construction and infrastructure audience through sharing information and learnings that will support change and help achieve better outcomes.

Key findings:

- An excess of demand presents many challenges including: upwards price pressure, the potential for poorer quality, time delays become more common, work backlogs build
- The construction workforce has seen a sharp increase in the number of people on the tools. However, future efforts must switch to working smarter and we must look at ways to achieve more with fewer people
- Reactive Decimation is periodically culling the workforce in response to cyclical market downturns. This perpetuates a backlog of work which is expensive and prone to reduced quality of output
- Waihangara Ara Rau’s Workforce Information Platform (WIP) has started to share better insights into the pipeline of work.

How demand creates a problem

An excess of demand presents many challenges including: upwards price pressure, the potential for poorer quality, time delays become more common, work backlogs build, choices need to be made about what work and projects should be prioritised which requires good information to be done well – good information is something that we have identified that we lack. This list is not comprehensive, and low demand bring its own challenges. The following tables demonstrate how demand is greater than our industries ability to supply capacity.

Table 10: New Zealand construction activity – actuals and pipeline projections

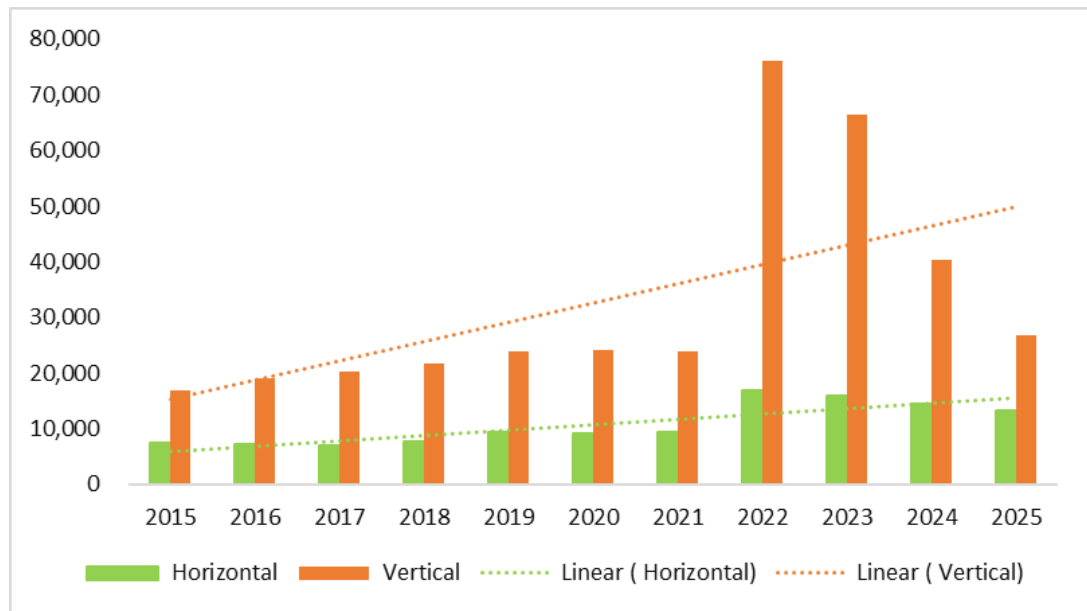
Source: Scarlatti, Pacificon & Waihangara Ara Rau modelling

NEW ZEALAND CONSTRUCTION NZ\$M	Horizontal	Vertical	TOTAL
Actuals:2015	7,370	16,857	24,227
2016	7,200	19,023	26,223
2017	6,900	20,351	27,251
2018	7,600	21,699	29,299
2019	9,500	23,913	33,413
2020	9,200	24,078	33,278
Estimate 2021	9,350	23,996	33,346
Forecast 2022	16,829	75,981	92,810
2023	16,022	66,333	82,355
2024	14,571	40,284	54,855
2025	13,337	26,739	40,076

New Zealand - the pipeline for 2022 shows \$92.8B worth of projects – this is compared to our capacity in 2019 and 2020 of under \$33.5B. Our largest step-jump was between 2018 and 2019 where activity grew by just over \$4B – given market feedback on tight labour-market conditions and supply-chain challenges, we would estimate that the next 4-year pipeline of \$270B is the equivalent of 7 years’ work.

Figure 33: New Zealand construction activity in NZ\$M - 2015 to 2020 actuals, 2021 to 2025 projections

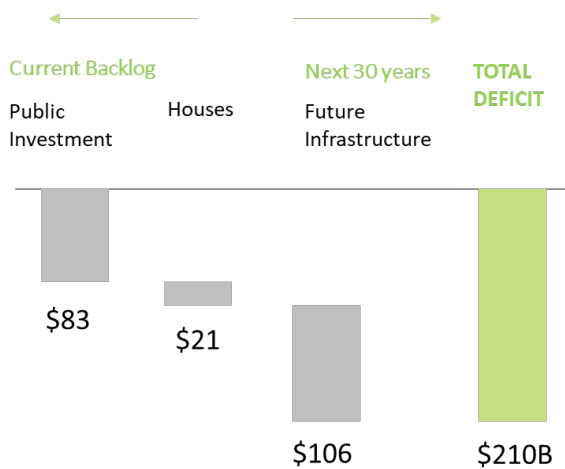
Source: Sciarlatti, Pacificon & Waihangara Ara Rau modelling



This graph shows the scale of the jump between our historical capacity and the demand captured through the Workforce Information Platform (WIP). Our tight labour market conditions suggest restricted opportunity to grow capacity in the short-term.

Figure 34: the treasury's estimated NZ infrastructure deficit

Source: treasury



The Treasury's 2022 Investment Statement has identified a \$210B infrastructure deficit:

- \$104B – what should have been built, but has not
 - \$83B shortfall in public investment
 - \$21B estimated to eliminate the current housing shortage
- \$106B future infrastructure gap over the next 30 years
 - what government is planning to spend v. identified demand.

[He Puna Hao Pātiki: 2022 Investment Statement \(treasury.govt.nz\)](https://www.treasury.govt.nz/publications/investment-statement-2022)

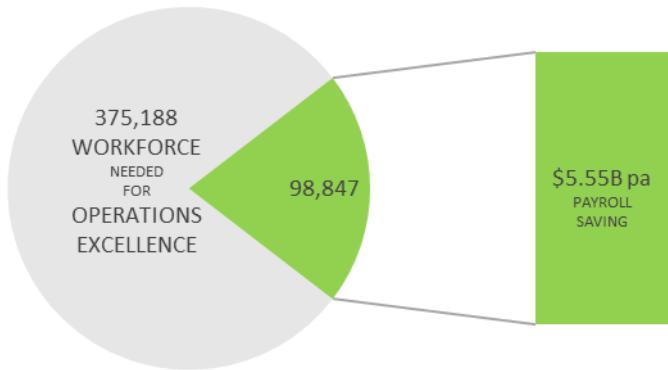
Productivity

As previously discussed, historically, the focus of Aotearoa New Zealand's construction workforce has been on increasing the number of people on the tools. Our future efforts must switch to working smarter and we must look at ways to achieve more with fewer people so we can get the maximum benefit from our available resources.

As illustrated below, a modest annual productivity improvement of 3.5% per annum has a large impact on the projected workforce.

Figure 35: Increasing productivity to 3.5% per annum saves in workforce and costs (e workforce 2035)

Source: Construction workforce planning and development project



Our modelling assumed that regional construction productivity would be the same as the rate of change for the previous ten years to 2019. (At the time of our calculations the last reported Construction GDP figures were for 2019).

We then demonstrated the difference in workforce requirements if we were to achieve

an average annual improvement in productivity of 3.5%. Incidentally, that annual increase in productivity is just below the improvement achieved by manufacturing globally.

The differences are demonstrated by the graph on our left.

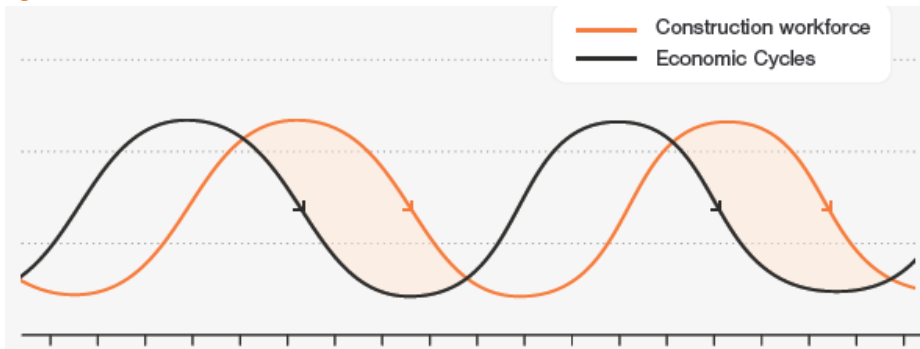
Naturally, forecasts looking into the future as far as 2035 can only at best give a direct and sense of travel, but the workforce saving is just under 21%. The payroll costs were calculated conservatively using the median wage without ancillary costs such as Kiwisaver, ACC etc. Realistically there will be a cost associated with lifting productivity but that should be a fraction of the illustrated saving in payroll.

So, let's take a look at what we have to say about our future of work, and keep in mind that there are significant financial benefits for those who choose to embrace change.

Stop Reactive Decimation

Reactive Decimation is culling the workforce in response to market conditions. Economic activity follows a pattern of rolling peaks and troughs which, over time, demonstrate a predictable pattern, although years in the cycle may vary.

Figure 35: Reactive Decimation



These cyclical swings have multiple negative effects on our industries:

Retention - many skilled workers leave the industry for more predictable job opportunities.

Recruitment – becomes more challenging for an industry that is perceived as being an unstable career choice.

Backlog of work - is expensive and prone to reduced quality of output due to heightened urgency. An example of this is the current housing shortage, compounded by the Global Financial Crisis, which saw us fall behind by an estimated 40,000 houses.

For better long-term outcomes we should aim to build the workforce to the trendline.



Created by Gregor Cresnar from the Noun Project

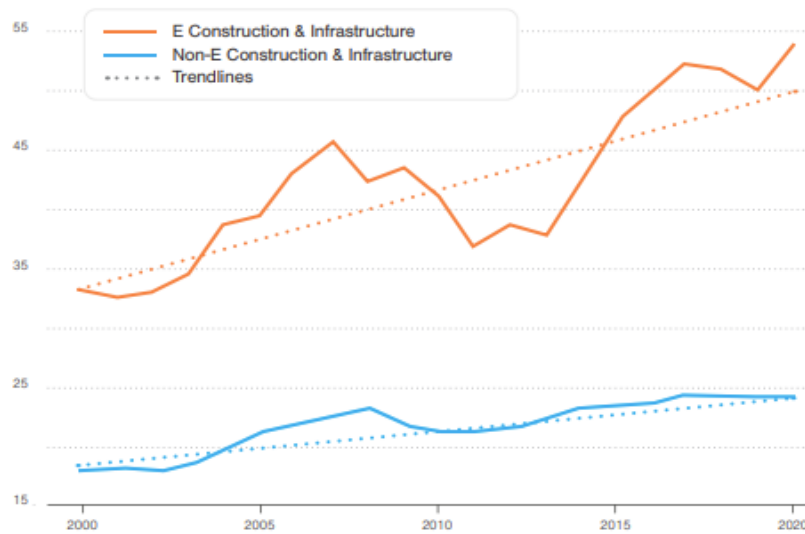
Is it feasible to achieve an average annual improvement in productivity of 3.5% within your industry?

Click to [Answer online](#) or scan the code below



Figure 36: Reactive Decimation of Workforce

Source: Infometrics, NZ Statistics, Waihanga Ara Rau modelling



The 2000 – 2019 history demonstrates that the construction workforce nationally has grown significantly faster than our population. With only modest productivity improvements this metric grows larger – but will we be competitive enough to attract the people required to grow our workforce?

The graph also highlights the current practice of decimating the workforce

in response to economic cycles. From 2007 to 2011, there was a sharp decline in both workforce and WM (workforce metric which records the number of construction workforce per thousand of the general population) can be observed. This graph also shows that the E classifications’ response is more volatile than the non-E part of our sector.

The trendline shows our recommended path for workforce planning and development – build the workforce to the trendline of demand. The loss of capability and corresponding lack of construction activity created, at least in part, has contributed to the housing shortage we are experiencing now. COVID-19 responses such as Apprentice Boost and the Targeted Training and Apprenticeship Fund (TTAF) have reduced the repetition of this effect in the 2020s, but there is still ground to be made up, particularly in addressing the housing shortage.

Improving market intelligence

Better outcomes require better planning. Better planning requires better intelligence. Part of what we hope will add value to our Construction & Infrastructure audience is share information and learnings that will aid achieving better outcomes and a resilient sector that adds real value to our society.

Workforce Information Platform

Our Workforce Information Platform has insights into the pipeline of work, not just in monetary terms but extrapolating this out to workforce requirements to complete the work. This highlighted in quantifiable terms the gap between our existing capacity.

Figure 37: Workforce Information Platform View (supply/Demand and below Supply Channels)

Source: <https://wip.org.nz/>

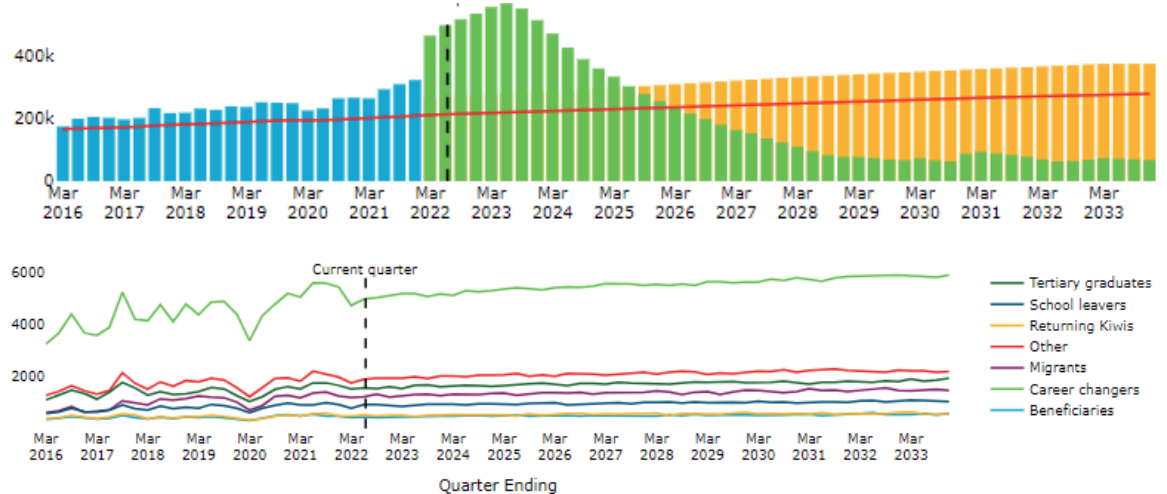
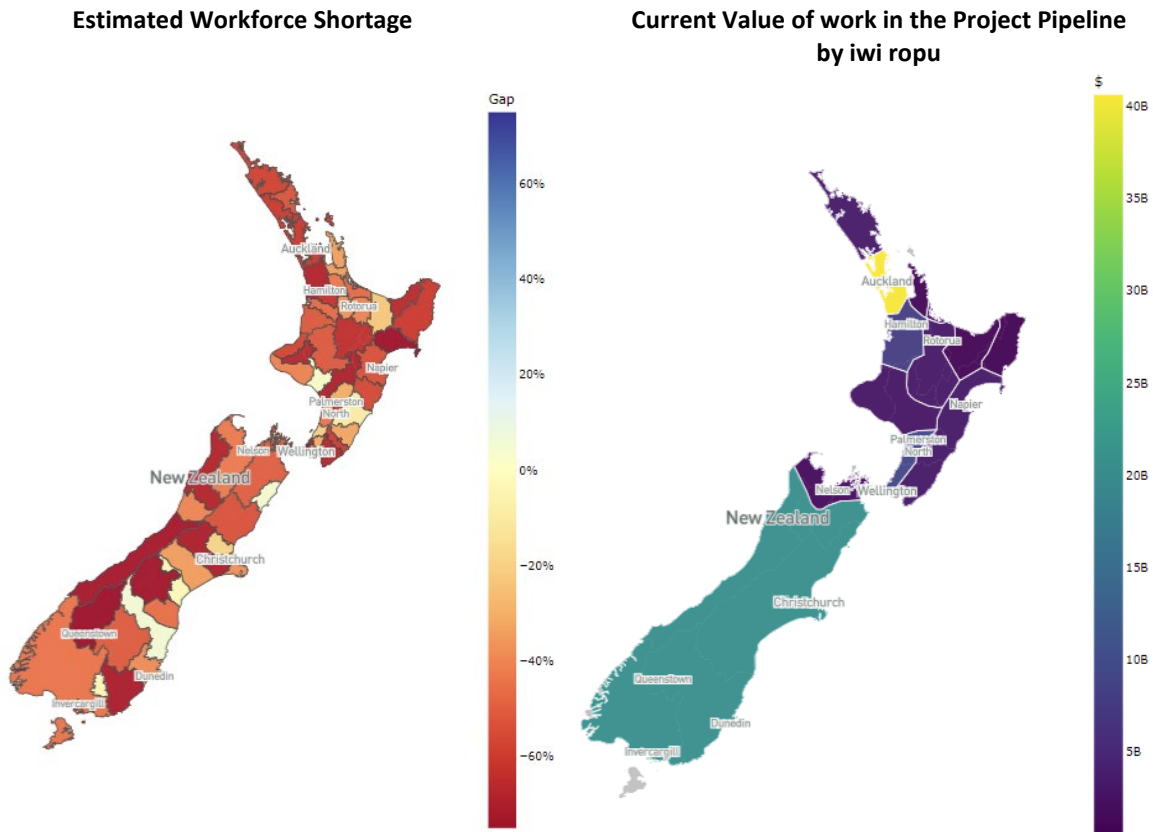


Figure 38: Supply /demand gap heat map *Left* & Iwi ropu building project value *Right*
 Source: <https://wip.org.nz/>



Three Waters

This industry highlights the difficulties and likely consequences of not having accurate, timely data which becomes even more important when market consolidation, and large-scale development is proposed. Good decisions rely on good information – without it an abnormally large number of decisions are unlikely to be delivered within the planned parameters. More time and greater cost.

The Water Workforce Analysis (WWA) by Deloitte has estimated the current water workforce at 15,000. There is no single source estimate of the current workforce across councils, contractors and consultants and the Deloitte estimate was based on a combination of RFI (Request for Information) data, anecdotal evidence from conversations with sector participants and extrapolation of workforce data across the sector based on the largest water sector. It is our view that this approach is likely to be far more accurate than the water specific ANZSIC codes workforce numbers shown below.

The Infometrics numbers indicate a workforce of 2,870 based on ANZSIC codes and numbers sourced from NZ Statistics. Many water organisations are part of local government so appear under O753000 code meaning we can't get a reliable indicative picture of the industry – their age, ethnic, educational profiles, hours worked or productivity. It also means that our business organisational profile may not be representative given the large proportion of the workforce not captured.

The WWA is forecasting an increase demand for workforce for Three Waters at approximately 11,500 or over 75% increase by 2035. The number of people required will be higher than this because, anecdotally, many of the operations workforce is nearing retirement age. This is anticipated to add a further layer of complexity. The lack of good information is going to make a challenging task even tougher.

A skilled workforce, unlike water, cannot be turned on and off like a tap – not without expensive repercussions.

Good decisions require good information – without it, risk increases exponentially. Given this industry is about to embark on a major restructuring, it highlights the need for us to improve our sourcing, accuracy, and timeliness of information.

Transformational Change Models

Overview

During our Regional Construction Workforce Planning and Development Project and throughout this report we have identified three common core industry pain points. The scale of the demand - supply gap in terms of available construction workforce, retention of existing staff, and low levels of productivity growth.

High level solutions identified were:

- Increase the workforce – the scale of the gap meant that was unrealistic
- Achieve more with the same or similar workforce – improving productivity
- Do less – defer or cancel projects.

This section focuses on the last two solutions – how in the future we might be able to achieve more with less and how investment decisions can effectively be prioritised into categories such as ‘action’, ‘defer’, and ‘cancel’. We provide four models that show how we might achieve more with less, and how we could defer or cancel projects with least detriment to our societies.

Key findings:

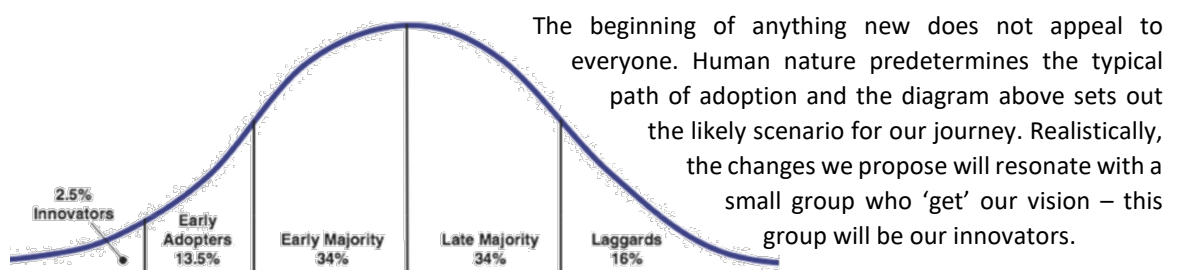
- We foresee the Future of Work will bring a lot of change - disruption for our industries is inevitable, so is the fact that anything new does not appeal to everyone
- While change carries an element of risk, the changes proposed are less risky because they have been done before – by the manufacturing industry
- All our organisational “achieve more with less” approaches/models require high levels of accomplishment in interpersonal dynamics to deliver best results

The four models in summary:

- Optimising workforce capacity - demonstrates the key elements for optimising our workforce capacity
- Capability model - outlines the core elements and sub-elements of how we go about building the capability of our workforce
- Productivity Benefits model - shows the linkages and benefits of improving productivity
- WEW, an Impact Criteria Model - a holistic decision approach to construction activity and activity outcomes – Wellbeing, Enablers, and Wealth.

Change Process – the Innovation Curve

We should not be surprised or discouraged by only a small group engaging in the process for change – it’s not at all new or unexpected. However, disruption for our industries is inevitable.



Innovators will enthusiastically share our journey, celebrate our successes, and share the lessons from our failures. There will be dividends for this group; they will get the first-mover advantage which means they are more likely to take market share as the changes take hold and become fundamental to industry best practice.

Those who are perceptive and able to read the signs for what lies ahead are the next group to get onboard, also known as the Early Adopters. In a scenario where a mature market needs to consolidate to develop

the capabilities required for future success, there will be winners and losers. Leaving it late to become part of the change may mean too late, as the opportunity to become part of the winners’ group will pass as they create their own scale and momentum.

Getting in early improves your chances of securing a bright future, however, it will take courage as all change involves stretch that tests confidence and resolve – but most of us have experienced this feeling in some endeavour during our life; learning a new sport, beginning a new relationship, tackling a new qualification – anything that involves developing a new skill.

While change carries an element of risk, the changes proposed are less risky because they have been done before – by the manufacturing industry. There are some differences in fundamental dynamics between Construction & Infrastructure and Manufacturing, but if we see that all human endeavour combines creativity, systems, and processes to achieve the outcomes we require, then we can find ways to accommodate the differences and still achieve sustainable continuous improvement.

Solution Execution – the How

We came up with four models that show how we might achieve more with less, and how we could defer or cancel projects with least detriment to our regional societies – this last one really has more of a socio-economic theme while the others directly address Workforce Development.

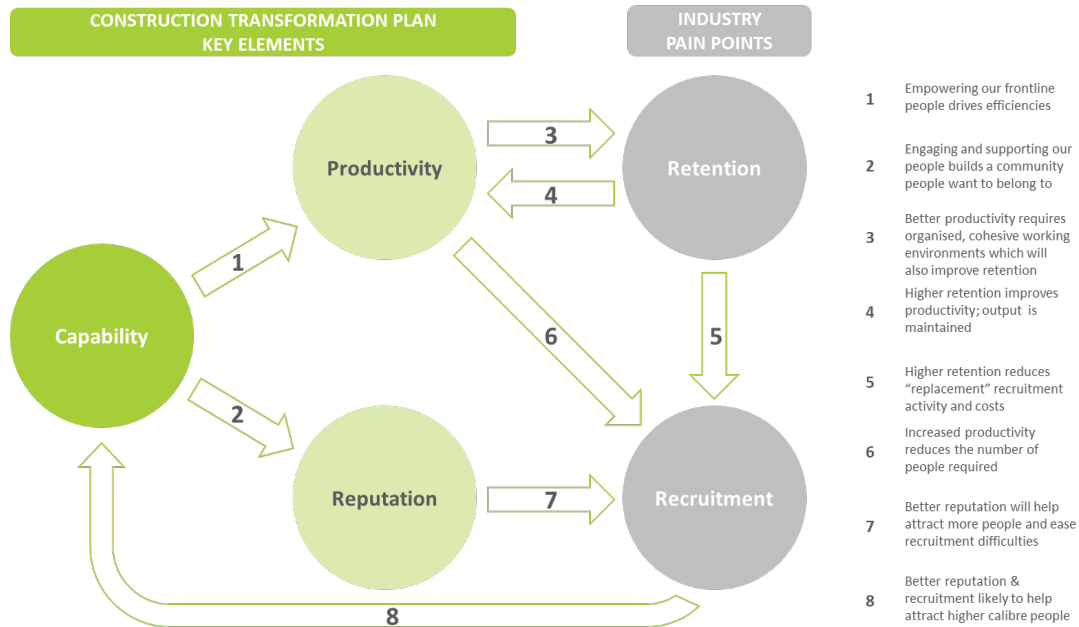
The first model demonstrates the key elements for optimising our workforce capacity. You can see on the right-hand side the industry pain points, and on the left-hand side the goals of the Construction Transformation Plan and how these impact on one another.

We seek to be absolutely transparent about what is involved, because most of it will be new to many of our readers. Also – a warning, there are some that claim to do what we are outlining, but without accepting it in its entirety and zealously walking the talk the benefits will not be realised.

Figure 39: Optimising workforce capacity

Source: Waihanga Ara Rau modelling

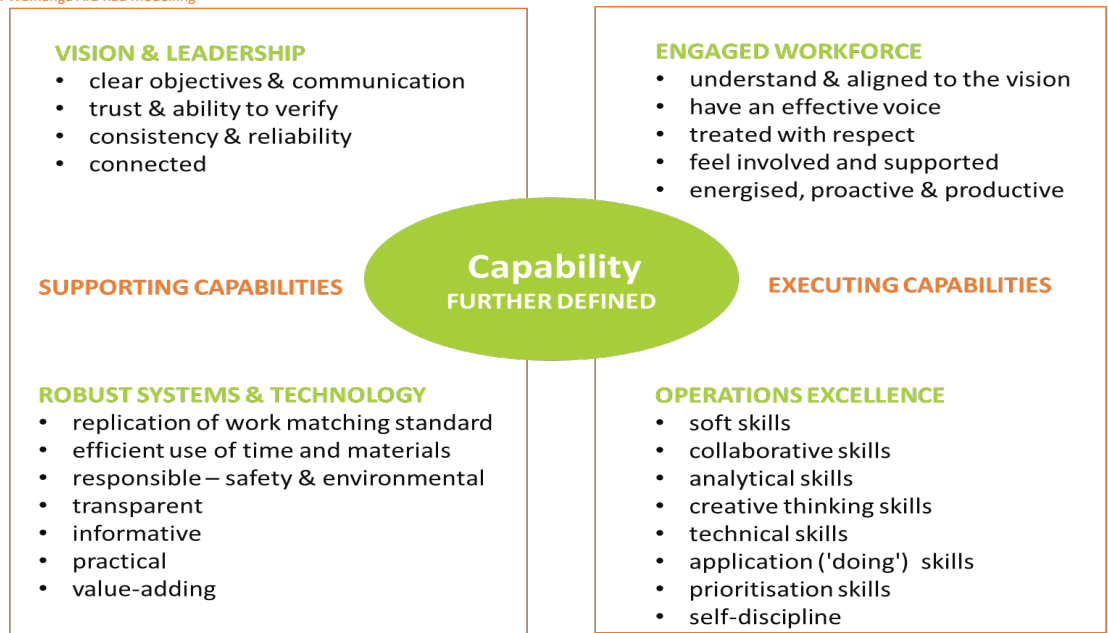
Maximising the ability to meet demand necessitates an industry focus on its people and productivity. This is reflected by reported *industry pain points* which can be addressed by the prime goals of the construction transformation plan.



These are high-level diagrams designed to clearly indicate the direction of travel required, without specifying detail which is something that is developed as part of organisations journey of change. These are not new concepts, the manufacturing sector has been on this journey for over 50 years starting in Japan under the guidance of Edwards Deming – an American who couldn’t convince the American Automobile industry to adopt his ideas for improvement.

Figure 40: Capability model

Source: Waihanga Ara Rau modelling



Our Capability model outlines the core elements and sub-elements of how we go about building the capability of our workforce.

We show the distinction between supporting and executing capabilities. Supporting capabilities are the purview of the leadership and management while the executing capabilities are pre-requisites for the workforce to drive continuous improvement and productivity gains. You will note that most of the skills focus on interpersonal dynamics which are key to achieving resilience for our industries.

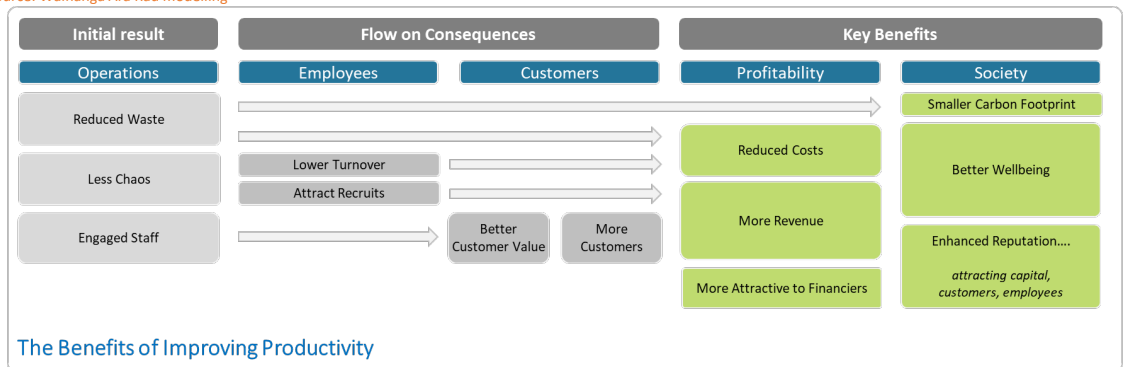
Our below outlined Productivity Benefits model shows the linkages and benefits of improving productivity. You can see from the Key Benefits section that it benefits both profitability and societal outcomes.

Some of you will be familiar with or heard of Lean and Agile. Both are employed as part of an Operations Excellence strategy, simplistically put, Agile typically tackles collaboration in multi-disciplinary teams often created for project work, while Lean is process focused aiming to reduce the unnecessary or detrimental elements of a process to deliver a repeatable outcome.

Both approaches require high levels of accomplishment in interpersonal dynamics to deliver best results.

Figure 41: Productivity benefits

Source: Waihanga Ara Rau modelling



The fourth solution is a construction & infrastructure investment impact criteria model we refer to as WEW. This model takes a holistic approach to construction activity focusing on the outcome the activity has on our societies categorised into Wellbeing, Enablers and Wealth.



Created by Gregor Cresnar from the Noun Project

Where in the "Optimising Workforce Capacity" chart do you feel your business/industry is most likely to falter?

[Click to Answer online](#) or [scan the code below](#)



Wellbeing, Enablers, and Wealth (WEW) – Making Better Choices

Construction investment decisions impact our society and shape our future. With persistent capacity constraints on the sector, projects need to be prioritised into categories such as ‘action’, ‘defer’, and ‘cancel’.

To ensure our society is sustainable, and operates with the necessary level of social contract, we need a balanced investment approach. To achieve this, we require a way of prioritising work aligned to regional needs and based on a projects impact on society. That’s why the Regional Construction Workforce Planning & Development Project formulated WEW, an Impact Criteria Model; a holistic approach to construction activity and activity outcomes – Wellbeing, Enablers, and Wealth.

Figure 42: WEW impact criteria model

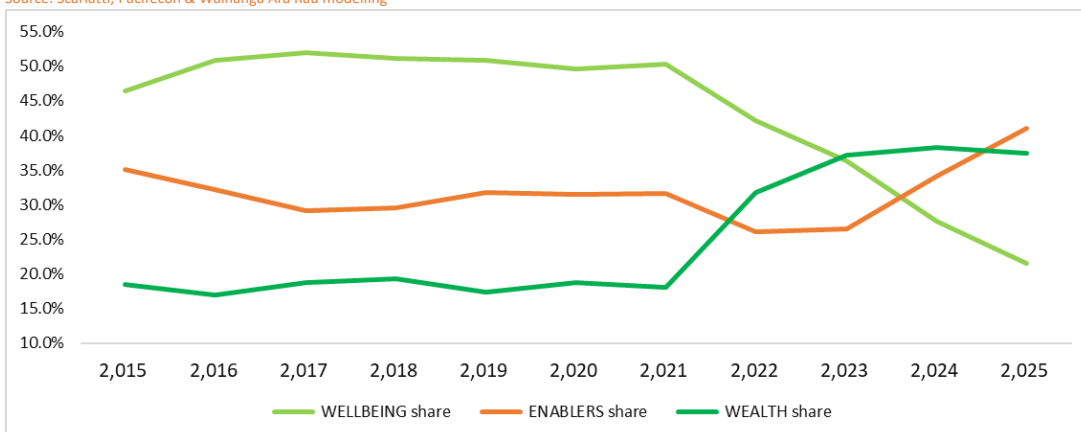
Source: Waihanga Ara Rau modelling



This model looks at the share of investment in each category and the per capita investment on a regional basis to identify areas of potential over or under investment. The idea being that a region would prioritise projects that compensate for past under-investment. When faced with excessive demand we can use these criteria as part of the investment decision-making process, for example prioritising projects that correct an imbalance and avoiding projects that create one.

The below graph shows that investment intentions are skewed away from the typical pattern of construction investment. Currently we rely on “the market” to make choices about which projects start and which don’t – deferred or cancelled. The lack of information that currently exists indicate an inefficient market mechanism.

Source: Scarlatti, Pacifecon & Waihanga Ara Rau modelling



The WEW model provides insight into previous outcomes from construction investment which can identify potential imbalances when looking at both share and per capita investment by region. This type of model is pertinent to Economic Development Agencies, policy makers and industry – the best form of business is identifying a need gap and filling it, so this is entirely compatible for both social policy and commercial interests.

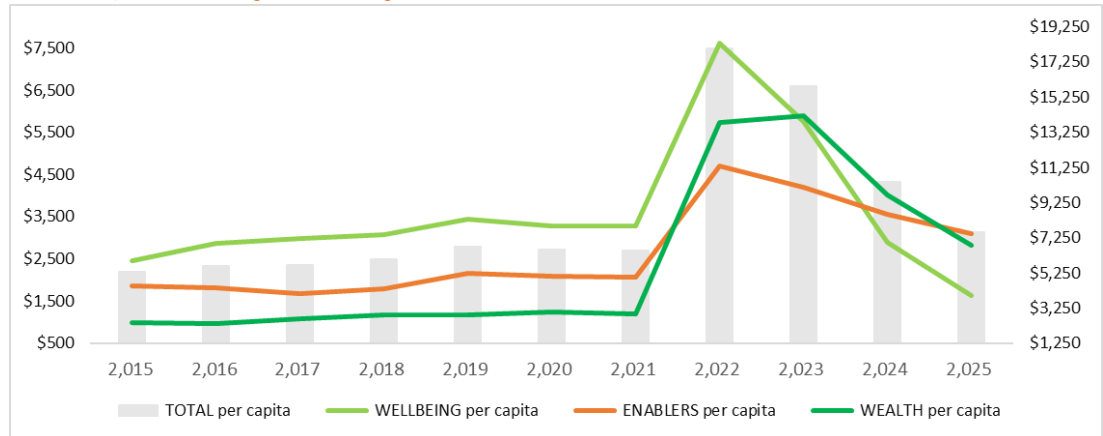
From 2021 we see the effect that could take place if projects are not considered holistically by a region.

WEW Investment per capita

This graph shows the huge leap in per capita investment from actual results to intentions from 2022. You can tell from previous increases that the pipeline intention is not capable of being delivered in the timeframes indicated by the graph. The four-year pipeline is the equivalent of approximately seven years capacity.

Figure 44: Actual and pipeline per capita investment by wellbeing, enablers, and wealth

Source: Scarlatti, Pacifecon & Waihangara Rau modelling



The peak wave in demand will continue to roll forward in time with non-delivery and as deferred and additional projects come on stream. The data reflects planning timeframes, most fitting within a 30-month window, which demonstrates that the current demand for construction resources far outstrips the current supply.

The aim of this model is to help regions make choices that limit the potential detriment caused by needing to cancel or defer projects. The better information hopefully will help identify projects worthy of prioritisation in accordance with the societal outcome the project achieves versus what the regional society needs.

For some regions this may necessitate establishing a mechanism to achieve this. The WEW model is not intended to be the sole criteria used, rather an integral part should regions see its benefit to them.

Challenging the Skills and Training System

Overview

In this section we outline how we will work with training providers to challenge our current skills and training system to fit our industries' needs into the future.

Key findings:

- Our training and education system is going through major reform and will have a stronger focus on employers and industry skills needs, providing more support for employees, and ensuring greater consistency in vocational education across the country
- Building our workforce capability is going to be fundamental to achieving our transformational ambitions for the Construction & Infrastructure sectors – this means more and different training and development programmes catering to life-long learning
- Micro credentials will be a key components of these life-long learning programmes
- Minimum Viable Product (MVP) is a new approach to developing training modules and programmes that can adapt quickly when it comes to requirements needed to be addressed, for example productivity improvement and emission reduction.

Implications for Skills and Training Ecosystem

The construction and infrastructure national training and education system is going through major reform and will have a stronger focus on employers and industry skills needs, providing more support for employees, and ensuring greater consistency in vocational education across the country. Longer term, this will increase the number of employers who are engaged in vocational education.

Work-integrated learning will become an increasingly important part of the vocational education system, giving people the opportunity and flexibility to earn while they learn and gain an education that is more directly relevant to the changing needs of industry and the workplace.

A unified vocational education system will bring together industry and educators to make sure New Zealand's workforce is fit for today's needs and tomorrow's expectations.

Waihangara Rau's qualifications and assurance teams are working with industry to better understand the need to:

- identify changing workforce demands and consider the level to which the current products respond to this
- identify how these should be reflected in the qualification and training framework
- ensure that these needs are communicated across the wider system so that relevant providers can and do respond to them
- create a framework and a conduit for delivery that supports learners and employers to access these skills

There are numerous enablers that surround this, including:

- the types of products we have available to develop
- incentives and sanctions created by the funding system
- the sustainability, agility and quality of providers
- incentives, sanctions and buy in from employers engaging with training that reflects future rather than current demand and participating in formal workplace training
- incentives and sanctions around reskilling for the existing workforce
- things like portability between different providers and modes of learning, recognition of current competence and prior learning
- the ability of the system to consider and manage potentially complex interconnections that subject a high degree of portability/transferability

- the level of skills amongst workplaces and the education sector as a whole to support the development of foundational skills (LLN and digital), critical thinking and reflective/metacognitive skills that support continuous learning.

Micro credentials

Micro credentials certify achievement but are smaller than a normal qualification. They are designed to cater to skill development opportunities that currently don't fit into our regulated tertiary education system.

From August onwards this year all current training schemes will be treated as micro-credentials aimed at simplifying New Zealand qualifications which is to support the intent of RoVE.

<https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/>

The following link provides a keyword search function for currently approved micro-credentials and who provides them, e.g.:

Title of Micro-credential	Level	Credits	Developer	Approval Date	Review Date
Connect Me - Telecommunications (Level 3)	3	21	Te Pūkenga WBL Limited	08/2021	01/06/2022
Butt Fusion Jointing for Water Networks	4	15	Te Pūkenga WBL Limited	08/2021	
Infrastructure - Erosion and Sediment Control Plans	4	20	Te Pūkenga WBL Limited	08/2021	06/12/2021
Kitchen Installation	3	35	Te Pūkenga WBL Limited	09/2021	30/05/2022

<https://www.nzqa.govt.nz/nzqf/search/microcredentials.do>

Minimum Viable Product (MVP)

We foresee the Future of Work bringing a lot of change.

As we have identified earlier, building our workforce capability is going to be fundamental to achieving our ambitions for the Construction & Infrastructure sectors – this means more and different training and development programmes catering to life-long learning.

This has guided our thinking about how vocational education might meet these challenges, so we have been considering how we might adapt more quickly when it comes to training and educational requirements needed to address, for example productivity improvement and emission reduction.

We have looked to learn how other aspects of human endeavour might help identify an approach that achieves this and have arrived at a concept used by entrepreneurial start-ups that develop their product or service on a minimum viable product basis. MVP logic says don't try for perfection when you are still trying to work out the answer to a need. Develop the minimum and put it out for market validation and critique – then update the offer following what the market has told you.

We envisage that (this is early days thinking) MVP's will have one provider partner and businesses and learners that are keen to participate in the development of a new credential. Early cohorts will be given the opportunity to complete any additional of changed sections to ensure that they are not penalised and will qualify for the credits when the MVP becomes a recognised credential.



Created by Gregor Cresnar
from the Noun Project

Is the MVP model worth further investigation and discussion in your sector?

[Click to Answer online](#)
or scan the code below



4. Appendix

Regional Construction Workforce Planning & Development Reports

The following 15 Regional Reports are part of the Regional Construction Workforce Planning & Development Project.



Regional Reports

North Island - Te Ika-a-Māui

[Northland - Tai Tokerau](#)

[Auckland](#)

[Waikato](#)

[Bay of Plenty](#)

[Gisborne - Tairāwhiti](#)

[Taranaki](#)

[Hawke's Bay](#)

[Manawatū - Whanganui](#)

[Wellington](#)

South Island - Te Waipounamu

[Nelson - Tasman](#)

[West Coast - Tai Poutini](#)

[Marlborough](#)

[Canterbury](#)

[Otago](#)

[Southland - Murihiku](#)

Summary A3 infographics

[A: Executive Summary](#)

[B: Better Choices](#)

[C: Stop Reactive Decimation](#)

[D: Improving Productivity](#)



Existing Industry Workforce Development Plans, Reports and Tools

Waihanga Ara Rau Plans

RE-ENERGISE NGĀ MAHI A MĀUI

Re-energise: Ngā Mahi a Māui is an Electricity Supply industry collaboration with representation across Distribution, Transmission and Generation.

[Link](#)



Ko Wai Tātou: We Are Water is a workforce development strategy for the water services sector, encompassing the Three Waters – drinking water supply, wastewater and stormwater.

[Link](#)

Industry Plans



The Civil Workforce Forum is an initiative to explore the workforce needs of the civil construction industry, as well as how the industry can bring new people on board and help them develop the skills they need on the path to becoming a skilled civil tradesperson.

[Link](#)

CONSTRUCTION SECTOR ACCORD

The Construction Sector Transformation Plan is a three-year action plan for change focused on addressing the challenges faced by the sector.

[Link](#)



Rautaki Hanganga o Aotearoa. New Zealand's Infrastructure Strategy sets out a path for a thriving New Zealand.

[Link](#)

Forecasting tools & Data



The Workforce Information Platform (WIP) is a forecasting tool that displays national and regional gaps and surpluses within the construction and infrastructure labour market.

[Link](#)



Mā Pango, Mā Whero, Ka Oti Ai Te Mahi. Māori Participation in the Electricity Industry

[Link](#)

Environmental Scan for the Electricity Supply Industry summary report for Kohi Whakaaro - the Electricity Supply Industry Workforce Development Strategy
 April 2021



Environmental Scan for the Electricity Supply Industry summary report.

[Link](#)