

Te Waihanga: Infrastructure Quarterly

A quarterly snapshot of issues and trends for New Zealand's infrastructure sector by the New Zealand Infrastructure Commission, Te Waihanga.



Geoff Cooper
GM Strategy, Te Waihanga

Foreword – Geoff Cooper

Te Waihanga held our annual conference, the *Looking Ahead Symposium*, at Te Pae in Christchurch last week, where we discussed challenges and opportunities for infrastructure to contribute to a thriving New Zealand. We were honoured to be the first event to be held in the brand new building, and doubly so to be joined by over 150 people from across the sector on each of the two days, and a further 200 participating online.

We also released New Zealand's first long-term infrastructure strategy, *Rautaki Hanganga o Aotearoa – New Zealand Infrastructure Strategy 2022–2052*. It sets a pathway to transform New Zealand's infrastructure over the next 30 years including how we can enable net-zero carbon emissions, build liveable cities, and support our towns and regions to flourish.

New Zealand will face many challenges in the decades ahead.

Parts of New Zealand are sinking, while the sea level is rising. At a moderate estimate, \$5B of local government assets are at risk.

The country needs 115,000 more homes, to meet current demand. With the population projected to increase to 6.2 million (or more) in the next 30 years, this is going to place considerably more pressure on housing.

Though we are already a world leader in renewable electricity production, we need to increase this nearly three times over to meet our net-zero carbon commitments.

These are just a few of the challenges coming our way. All solutions to these problems, to a greater or lesser degree, will involve infrastructure.

Our infrastructure is connected and we must all play a part in addressing this. No one party can solve these – we need central, local government, the private sector and private citizens to take responsibility for the challenges facing New Zealand for the people, places and businesses of this country to thrive.

Your leadership will be critical. This strategy brings together the best available information, insight, and cases for change from Aotearoa and around the world. It's strategic, not tactical – so I encourage you to digest it, talk about it with your teams, and use this in your own implementation plans. You can read it at strategy.tewaihanga.govt.nz.

As always, if you have any feedback, comments or questions, contact us.

What's in the National Infrastructure Pipeline

The National Infrastructure Pipeline (Pipeline) provides a forward view of planned infrastructure projects in New Zealand.

The project information is provided directly from government agencies, councils, and private sector entities that are involved in providing infrastructure services to New Zealanders, to support the way we live, work, and play. At the end of the March 2022 quarter, the Pipeline included more than 2,700 projects, worth about \$69 billion.

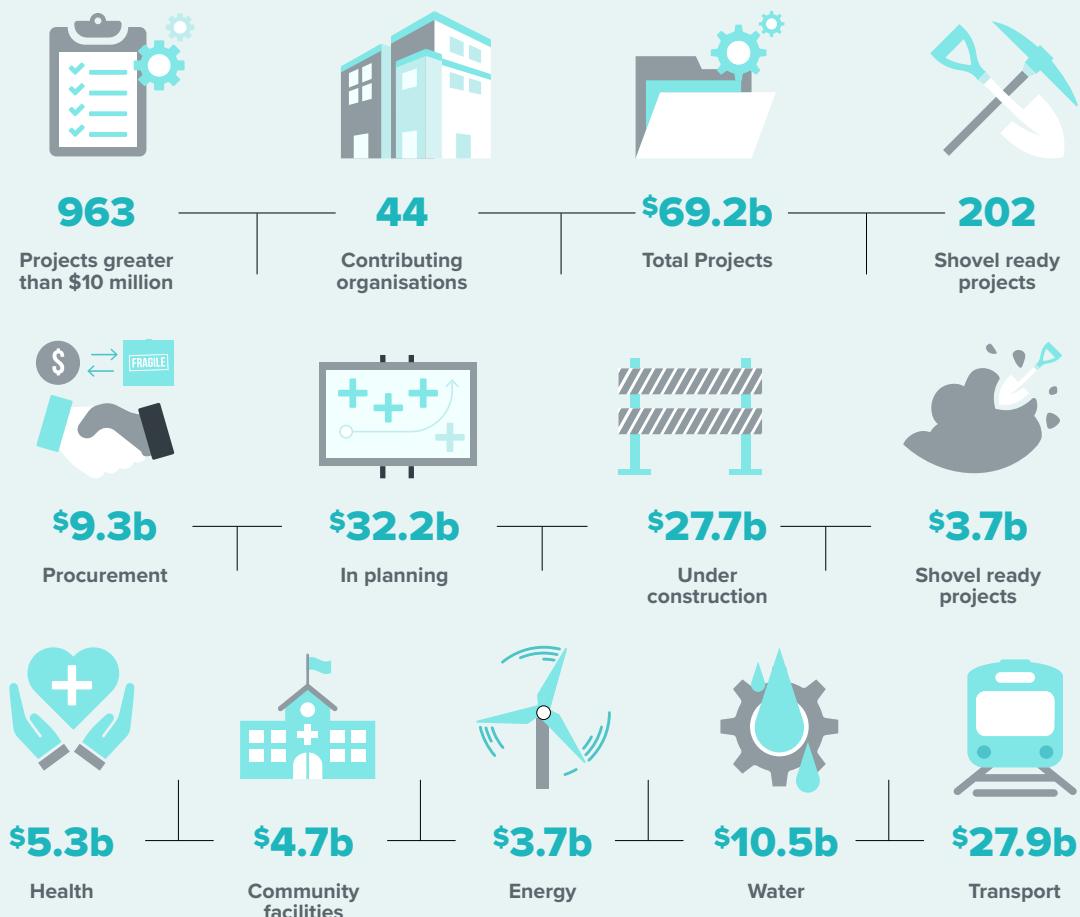
The Pipeline focuses on projects that have a higher level of certainty, encouraging industry to make informed decisions about planned activity in their sector and region, coordinate timeframes and to scale capability and capacity for delivery.

The Pipeline continues to grow and evolve into a comprehensive summary of planned activity in New Zealand across all infrastructure sectors.

Pipeline snapshot

Key changes in the March quarter update from December 2021 include:

- A total of 33 organisations have updated project information
- 46 projects on the Pipeline were completed, totalling \$630 million
- Additional projects from the Ministry of Health have been added
- We've welcomed several new contributors & projects including
 - › Wellington City Council
 - › Let's Get Wellington Moving
 - › Powerco
 - › Spark



Forecast spend per sector

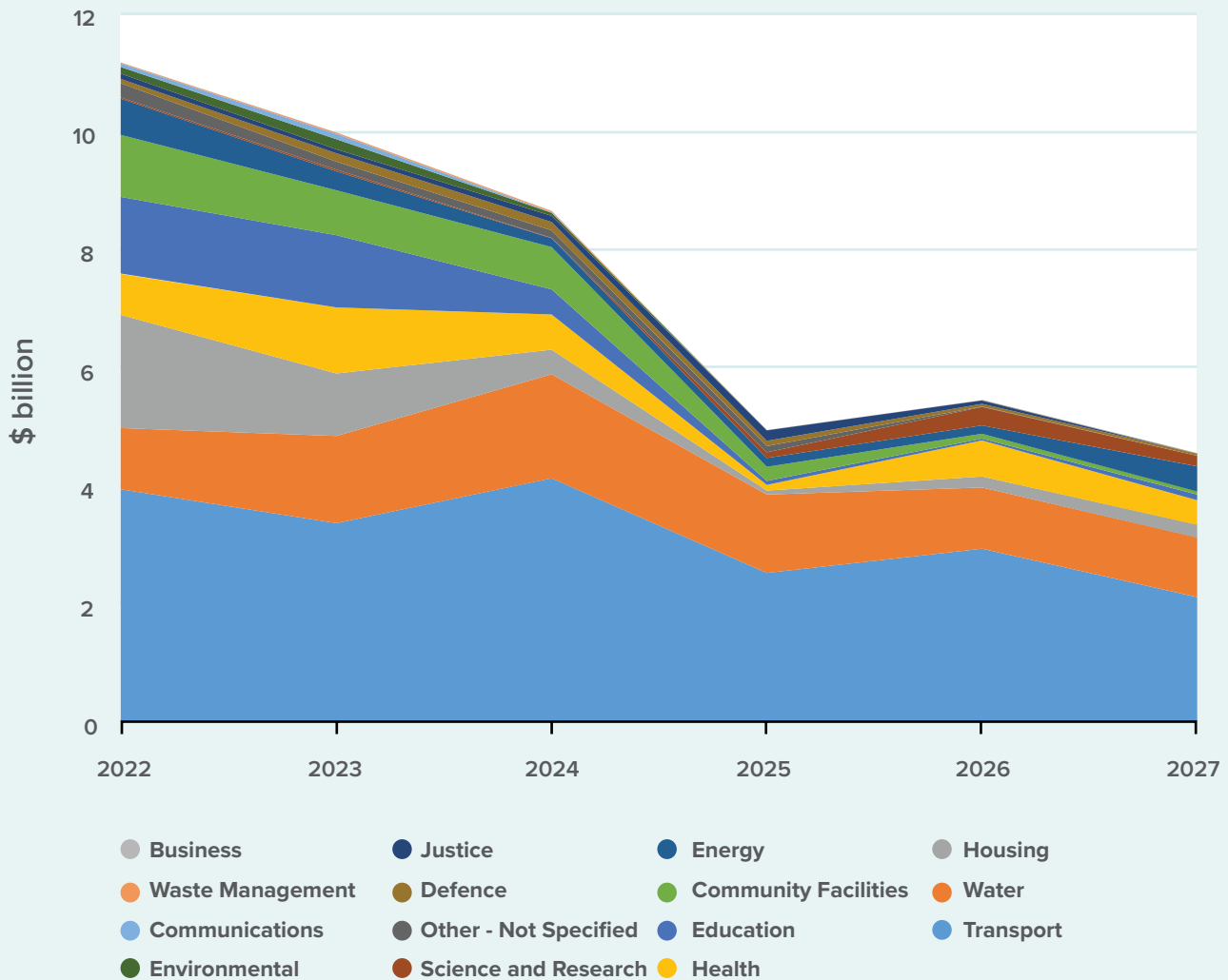
The forecast annual spend by sector for the projects in the Pipeline has been modelled. This year, spend on infrastructure projects is forecast to be \$11.2 billion. Against this spending in 2023 has increased significantly, from \$9 billion projected in the last quarter, to \$10 billion. This increase is due to the addition of new projects to the Pipeline and some project completion dates shifting.

Transport projects continue to dominate total spending on pipeline projects, accounting for just over 30% of forecast spend in 2022 (see Figure 1). Annual spend on water projects is forecast to continue increasing, up approximately 70% from just over \$1 billion in 2022 to nearly \$1.8 billion by 2024.

Figure 1:

Transport dominates projected infrastructure spending

Forecast project spend by sector



Source: National Infrastructure Pipeline - Te Waihanga



Regional spotlight – Wellington

There is lots of project activity in the Wellington region. The infrastructure Pipeline currently includes projects from some, but not all, Wellington region councils, as well as central government and some private infrastructure providers. Table 1 summarises significant projects in the Pipeline. Noting, of course, we have recently seen the completion of Transmission Gully.

We asked Siobhan Procter, Chief Infrastructure Officer at Wellington City Council, about work in progress:

WCC is currently managing several major renovation/upgrade projects – including the Te Whare Whakarauiki - Town Hall, and Te Matapihi - City Library.

How are you balancing heritage, sustainability, usability, and safety considerations with these big projects?

Te Matapihi is part of the greater Te Ngakau - Civic Precinct programme. A coordinated approach to heritage is really important. We're working with Studio Pacific across the

Table 1:

Significant Pipeline projects elsewhere in the Wellington region

| PROJECT | DELIVERY AGENCY | VALUE | PROJECT START |
|--|-------------------------|-----------------|---------------|
| LGWM Transformational Programme | Waka Kotahi | \$1b + | Q1 2019 |
| SH1 Otaki to North Levin | Waka Kotahi | \$500m - \$1b | Q4 2029 |
| LGWM City Streets | Waka Kotahi | \$250m - \$500m | Q1 2022 |
| Wellington Metro Rail Network Programme – Stage 5 – Automated Train protection | KiwiRail | \$250m - \$500m | Q3 2020 |
| Melling Interchange Improvements | Waka Kotahi | \$250m - \$500m | Q1 2020 |
| Te Matapihi ki te Ao Nui (Central Library) | Wellington City Council | \$100m - \$250m | Q3 2021 |

Source: National Infrastructure Pipeline - Te Waihanga

programme and each project has a Conservation Plan working with Heritage New Zealand and the Wellington City Council heritage team.

We are targeting a series of initiatives to obtain a Green Star 5 rating for Te Matapihi. All our project contractors are working hard to minimise waste and, wherever possible, to reuse materials. These efforts are a feature of the conservation plan and are contractually included in the design specifications.

The Town Hall strengthening, and restoration is a complex construction project. We're making the building modern and resilient, while enhancing its heritage character.

Wellington City Council is working in partnership with Te Herenga Waka Victoria University of Wellington and the New Zealand Symphony Orchestra to establish the National Music Centre, based around the Town Hall. Additions to the building include rehearsal spaces, improved performance spaces and sound studios.

Heritage is embedded in the project through a combination of the conservation plan for the building and having the heritage architect on board at the outset of planning and through the project.

Across this project safety is absolutely paramount. At times, we are weakening the building to undertake strengthening, so making sure each work area is safe requires constant focus. At the same time, the building more generally needs to be appropriately supported throughout. We do this through extensive temporary propping and using a range of sensors.

WCC is trialling some new approaches to community transport consultation, by setting up temporary cycleways, and encouraging road users to give experience-based feedback.

Can you talk us through this – and how is it going?

We're definitely finding the temporary cycleways cost effective. Partly because we're able to develop and deliver the projects much more quickly. Secondly because we're minimising the civil works involved, mostly focussing on road markings and physical separators. These materials and installation methods reduce costs significantly.

After some preliminary work in summer, we are just beginning of our first route from Newtown to the City. Installation of a first cut of the whole route using adaptable materials will happen over

several months. Once it's in, we'll be working hard to gather feedback on how it's going, so we can refine and improve things like signs, street markings, parking, and the position of dividers between the bike lanes and traffic.

The installation won't be perfect or include much landscaping but will encourage a lot more people to go by bike, e-scooter or skateboard between Newtown and the central city. In the future, these changes will be made permanent as part of Let's Get Wellington Moving's plans for mass rapid transit.

COVID-19, impacts from climate change, and global supply chain disruptions are making it much harder to plan, procure, and deliver on time and within budget; global is being felt at a local level to a degree it never has before.

How are you navigating this?

COVID-19, the impacts of climate change and global supply chain disruptions are all matters that the Te Matapihi Project is working through.

Procurement planning forms part of the Early Contractor Involvement (LT McGuinness contract Deliverables) with a particular emphasis on long-lead and potential price escalations being monitored by the Quantity Surveyor and Project Manager.

The Project is working with the Main Contractor and independent experts (sourcing and construction consultants) to evolve the methodology and programme, identifying long-lead items, and to make sure the project has adequate time to procure. Examples of long-lead items we have procured early include chillers, base isolators, façade, structural steel, and fabrication.

The project maintains a regular update on critical materials and programme impacts to ensure visibility and achievability.

Climate change is factored into different elements of the design. A 600mm lift to the ground floor to is a response to potential flash flooding and longer-term coastal issues. Further design features of the roof, external envelope, and associated downpipes, as well as storm water systems are all being considered with climate change impacts in mind.

COVID-19 continues to have a material impact on site efficiency, supply chains, and project costs. It's key to have a solid relationship with our contractor. Our approach to this has included strong site controls and protocols, a constant

focus on early procurement and lead times. Early procurement helps us manage both material availability and escalation – of course a challenge that comes along with an aggressive approach to early procurement is the pressure it places on storage. We expect the next phase of the supply and escalation issues will be contractor and sub-contractor/supplier failure.

What are some of the big strategic risks and issues you see emerging?

The sheer volume of construction works coming our way in the form of Let's Get Wellington Moving, over 550 earthquake prone buildings, water renewals and new assets, the bike network plan, and the work to support urban intensification is a risk. These projects are all happening in an environment where the CBD retail, entertainment and hospitality sectors are really struggling. We need to support the vibrancy of the city in the face of huge disruption.

In preparation for this, we have recently drafted a Development Response Plan based on five key principles:

- 1. People first** – The needs of the people of Wellington to safely go about their daily lives is at the centre of all decisions. This includes managing the safety risk and accessibility for people working in, living in, conducting business, and travelling past construction areas.

2. Our city has to continue to function –

Supporting those operating business, retail and hospitality to operate and make a living in a changing and at times disruptive physical location.

- 3. Plan and be prepared** – Early visibility of upcoming projects so we can use this time to plan and be prepared.

- 4. Communication** – Affected parties will have a voice and a seat at the table. Affected parties will be actively engaged and relationships forged in the planning for construction and during the delivery of projects across the city.

- 5. Build Back Better** – Better construction and better outcomes. Disruption will be used as a catalyst for changing expectations and behaviours in support of Wellington's long-term vision.

We are working hard to coordinate with all parties who are planning work across the city including Wellington Water, Wellington Electricity, Chorus, KiwiRail and Waka Kotahi. This coordination is designed to ensure optimum sequencing so we can keep the city moving. When we do have to dig up roads, we need to make the most of the opportunity.

Project Spotlight: Wellington Water

Wellington Water is installing 250 smart water meters in Greytown, Wairarapa.

The trial, funded through the Government's water reform stimulus funding, will assess the ways in which smart water metering technology can help residents better manage their water usage and assist in detecting potential water leaks at private properties.

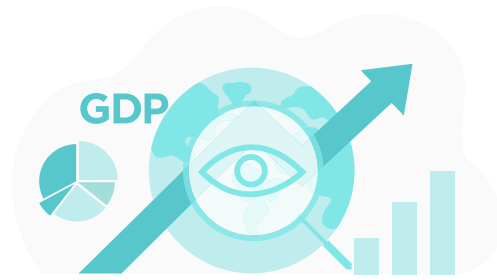
While the existing water meters are read once a year, the new smart meters will record real-time water usage and proactively identify water leaks. This helps local communities understand their personal water consumption habits, and ways to conserve water. This insight also helps Wellington Water and the council deliver water services and plan for the future.



Installers Eru Te Kahika (left) and Lu Fonoti (right) with one of the 250 smart meters Wellington Water is putting in Greytown, Wairarapa.

Economic insights

By Nadine Dodge
Senior Economist,
Te Waihanga



Inflation – what are the implications for civil construction?

It's common knowledge that inflation is rising rapidly in New Zealand. Everything is costing more these days, whether it's building a house, going to the grocery store, or filling up at the pump. The residential construction sector has been hit particularly hard, reflecting rising demand and constrained supply. We know that the civil construction sector is also facing challenges, with a rising infrastructure deficit and a constrained workforce available to deliver the investments that our country needs. However, inflation and its implications can be quite different for the residential and civil construction sectors.

The chart below looks at how inflation rates over the last decade compare between four price

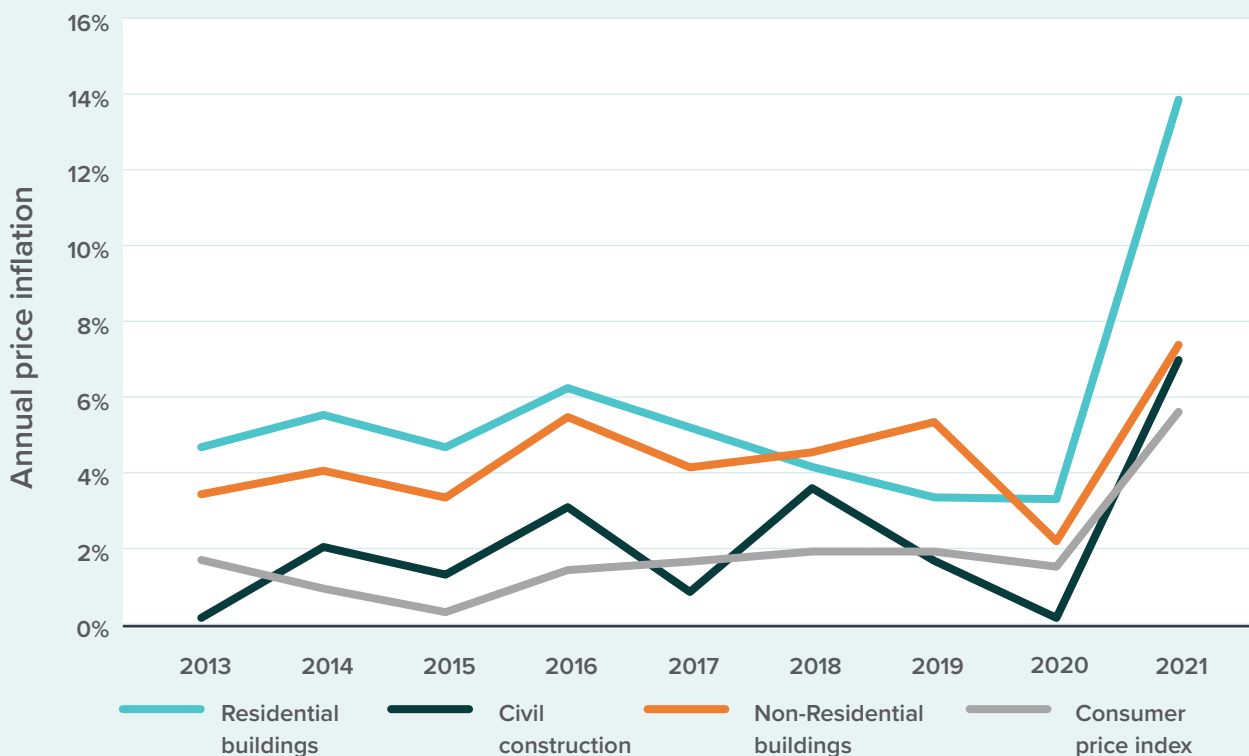
indices: residential buildings, non-residential buildings, civil construction, and the consumer price index (CPI). Over the last decade, civil construction inflation has tended to follow the CPI with inflation rates of 1-2% per year. In contrast, non-residential and residential building construction have tended to have higher inflation levels, at around 4% per year.

In 2021, non-residential and civil construction costs rose about half the rate of residential construction prices. However, inflation was still at the highest rate in a decade in these sectors: 7% for civil construction and 8% for non-residential construction, as compared to 14% in the residential construction sector.

Figure 2:

Construction sector inflation increases significantly

Annual inflation by construction subsector



Source: Te Waihanga, using data from Stats NZ Tatauranga Aotearoa.

How we measure up

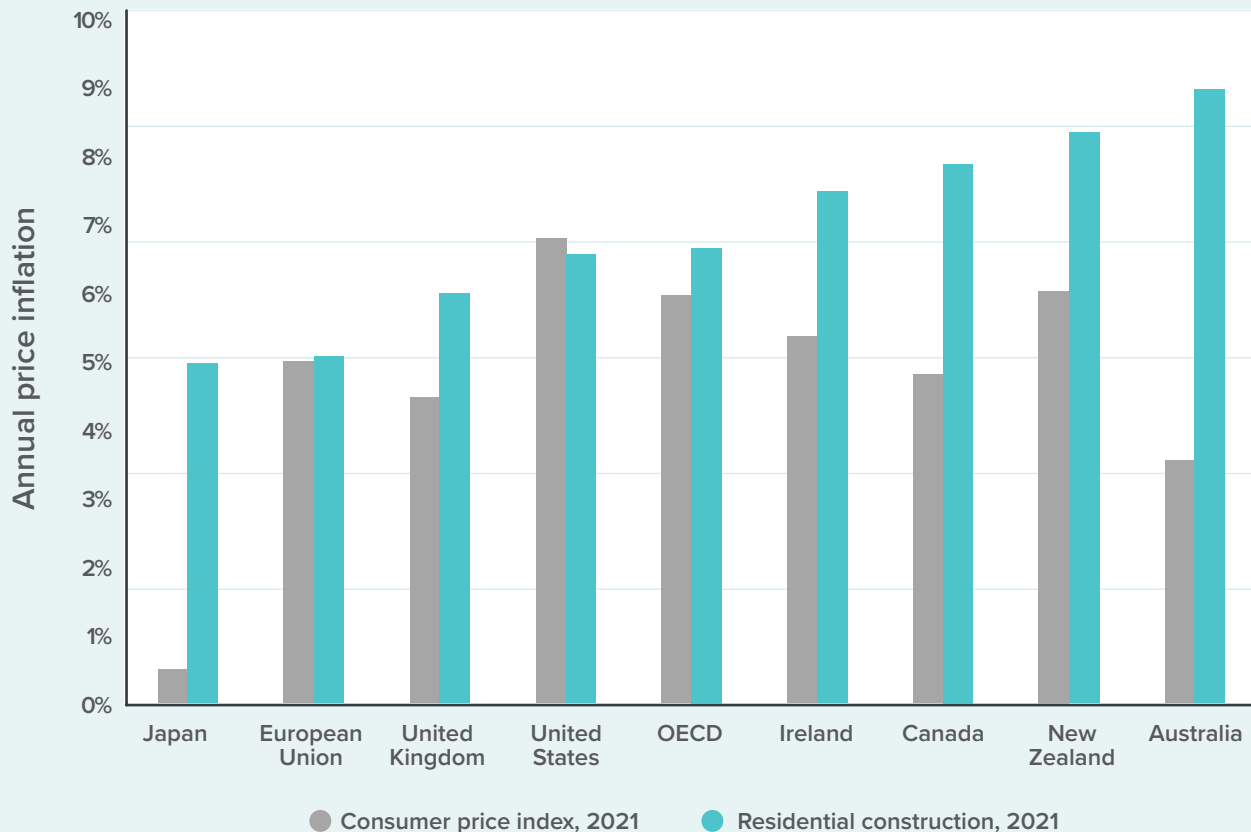
We know that our current inflation problems aren't unique to New Zealand – 32 of 45 middle and high-income countries saw inflation rates over 3% at the end of 2021. However, the implications for construction prices varies across countries. The chart below compares CPI and residential construction inflation over the last year in selected high-income countries. We see that some places,

such as Australia, Canada, and Ireland, share New Zealand's conundrum: high construction inflation that exceeds CPI inflation. However, in the United States and the European Union, construction inflation doesn't appear to be higher than elsewhere in the economy. This suggests that high construction inflation isn't an unavoidable problem.

Figure 3:

Construction sector inflation is leading CPI in many countries

Annual inflation in selected countries, Q4 2021



Source: Te Waihanga (see appendix)

What's coming next?

If trends over the past decade continue, we can generally expect civil construction costs to follow the CPI. So, what are the predictions for the CPI over the next year? For the first quarter of 2022,

the CPI growth expectation one year out was 4.4%. This would be an improvement on the third quarter 2021 inflation rate of 5.9%, but still higher than the RBNZ target of 1-3% over the medium term.

Given that our current inflation problems

were not expected, how much can we trust those predictions anyway? The following chart digs into this question by comparing expected and actual CPI growth one year out since 1988. While we don't have a crystal ball, expectations are a reasonably good predictor of actual inflation levels over the following year. Since 1988, predictions have been within 1 percentage point two thirds of the time and within 2 percentage points of actual levels 90% of the time.

The last year has been an historical aberration. Unpredicted periods of high inflation (with CPI inflation over 3%) are uncommon and have only happened in 13% of quarters. What happened in the last half of 2021 – inflation forecasts off by more than 3 percentage points – is the largest gap between expectations and actuals that we've seen over the last three decades.

The question is: Have forecasters captured the changing environment and the ongoing global shocks? Given that the current RBNZ forecast is for 4.4% inflation in a year's time, should we be more pessimistic?

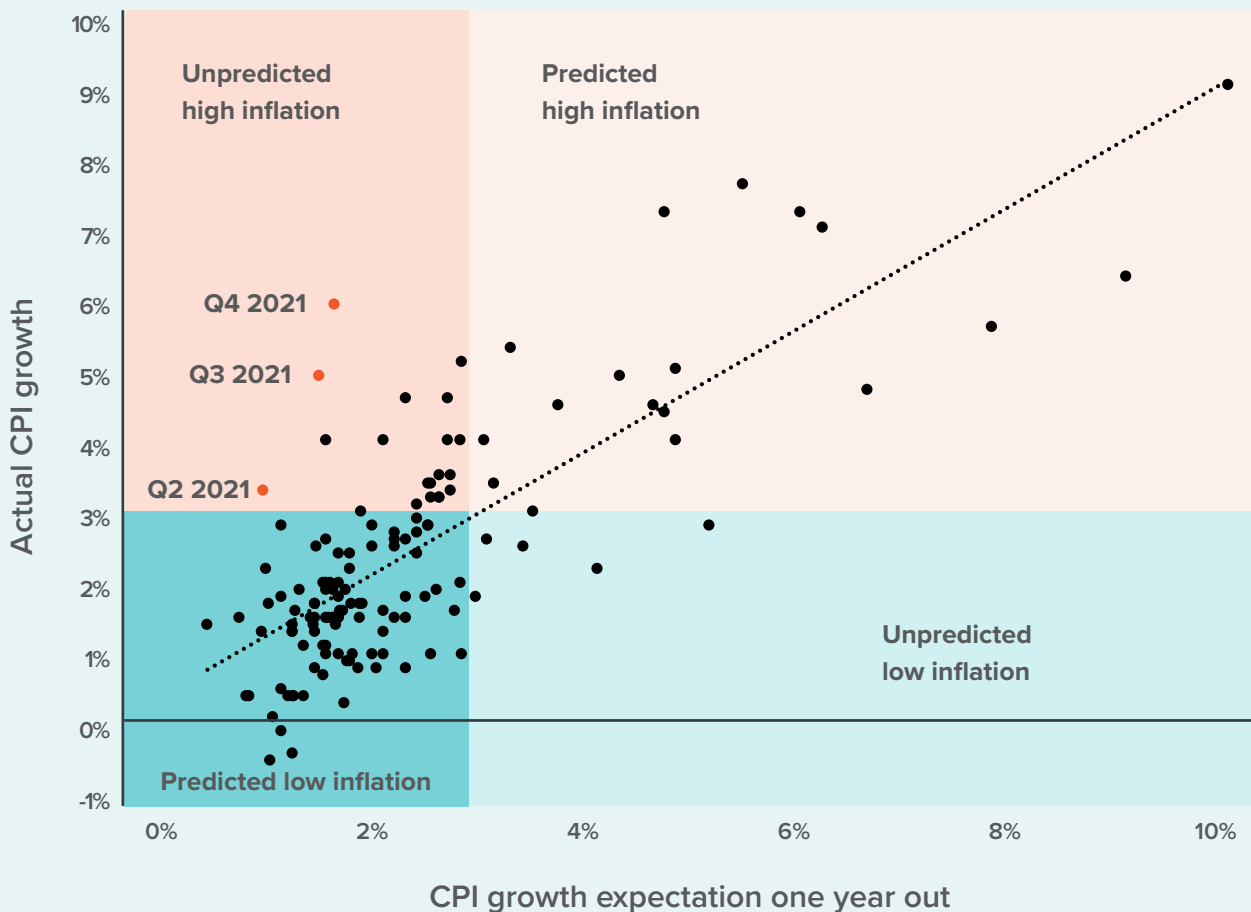
If we look at the distribution of CPI growth expectations, we see there is substantial disagreement on what the future will hold. While most people think inflation one year out will be in the 4-5% range, a large share of people think it will stay high, at around 6%. This pattern continues over the longer term; most people think inflation will drop to near the target band in two years, but many disagree.

Recent experience shows that there are unusually high risks, and the past isn't always the best predictor of the future. Predicting the future turns out to be a tricky business, especially during times of war and global pandemics.

Figure 4:

Current inflation is significantly above forecast

Expected inflation (one year ahead) vs actual inflation



Source: Te Waihanga, using data from the Reserve Bank of New Zealand.

Appendix: Residential construction cost inflation data

| Country | Source | Most recent available data | Annual inflation over last 5 years | Annual inflation over last year |
|----------------|---------------|----------------------------|------------------------------------|---------------------------------|
| Switzerland | Eurostat | Q2-2021 | No data | No data |
| Denmark | Eurostat | Q4-2021 | 2.0% | 3.2% |
| Poland | Eurostat | Q2-2021 | No data | No data |
| France | Eurostat | Q2-2021 | No data | No data |
| Greece | Eurostat | Q4-2021 | 1.2% | 3.0% |
| Japan | MLIT | Q4-2021 | 2.6% | 4.9% |
| Italy | Eurostat | Q4-2021 | 1.7% | 2.8% |
| Belgium | Eurostat | Q2-2021 | No data | No data |
| Luxembourg | Eurostat | Q2-2021 | No data | No data |
| Netherlands | Eurostat | Q4-2021 | 2.9% | 2.5% |
| Portugal | Eurostat | Q4-2021 | 3.2% | 3.7% |
| United Kingdom | Eurostat/ONS | Q4-2021 | 3.7% | 5.9% |
| Sweden | Eurostat | Q4-2021 | 3.7% | 6.8% |
| Ireland | Eurostat | Q3-2021 | 3.2% | 7.4% |
| European Union | Eurostat | Q4-2021 | 3.3% | 5.0% |
| Finland | Eurostat | Q4-2021 | 2.6% | 6.6% |
| Lithuania | Eurostat | Q4-2021 | 4.7% | 5.1% |
| Australia | ABS | Q3-2021 | 3.0% | 8.9% |
| Germany | Eurostat | Q4-2021 | 3.8% | 5.3% |
| Slovakia | Eurostat | Q3-2021 | 4.6% | 9.4% |
| Latvia | Eurostat | Q4-2021 | 6.1% | 8.1% |
| Czech Republic | Eurostat | Q4-2021 | 5.4% | 9.1% |
| New Zealand | SNZ | Q4-2021 | 5.5% | 8.2% |
| Norway | Eurostat | Q4-2021 | 4.7% | 8.2% |
| Spain | Eurostat | Q4-2021 | 3.3% | 5.8% |
| Estonia | Eurostat | Q4-2021 | 4.3% | 8.7% |
| United States | Census Bureau | Q4-2021 | 5.7% | 6.5% |
| Austria | Eurostat | Q4-2021 | 3.8% | 3.5% |
| Slovenia | Eurostat | Q4-2021 | 4.2% | 6.6% |
| Hungary | Eurostat | Q4-2021 | 10.5% | 7.5% |
| Canada | StatCan | Q4-2021 | 5.7% | 7.8% |
| Turkey | Eurostat | Q4-2021 | 23.2% | 23.6% |

Source notes:

ABS = Australian Bureau of Statistics: <https://www.abs.gov.au/statistics/economy/price-indexes-and-inflation/producer-price-indexes-australia/sep-2021#data-download>

Eurostat: https://ec.europa.eu/eurostat/databrowser/view/STS_COPI_Q__custom_1809990/default/table?lang=en

StatCan = Statistics Canada: <https://open.canada.ca/data/en/dataset/6c365b33-43fb-45aa-9e7b-5f5765d771ba> [Canadian data only covers 2017- 2021 period]

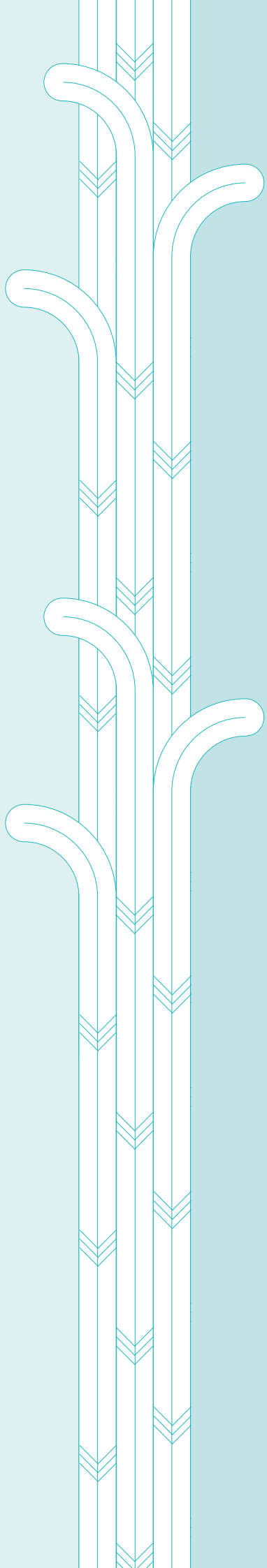
MLIT = Ministry of Land, Infrastructure, Transport and Tourism: https://www.mlit.go.jp/sogoseisaku/jouhouka/sosei_jouhouka_tk4_000112.html

SNZ = Statistics New Zealand: <https://www.stats.govt.nz/methods/price-indexes-for-the-construction-industry/>

ONS = Office of National Statistics: <https://www.ons.gov.uk/businessindustryandtrade/constructionindustry/datasets/interimconstructionoutputpriceindices>

Census Bureau: <https://www.census.gov/construction/cpi/>

Data not gathered for the following OECD countries: Chile, Colombia, Costa Rica, South Korea, Iceland, Israel, and Mexico.



www.tewaihanga.govt.nz