



# Infrastructure Trends in New Zealand





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Our view on some of the current trends influencing New Zealand’s infrastructure sector.



A horizon scan of how international affairs could impact New Zealand’s infrastructure sector in the future.



Climate change cannot be avoided or ignored. How can New Zealand build new and adapt existing infrastructure to cope with a new environment?



How do we harness new technologies, leverage tools and build capability to improve project delivery in a changing social landscape?



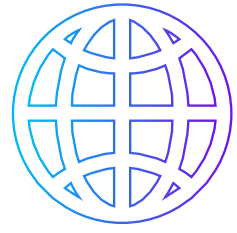


# 01

## Global events impacting New Zealand

Horizon scan on how global politics, supply chain risks, and economic uncertainty may impact New Zealand's infrastructure in the future.





## Global events impacting New Zealand

### How international affairs could impact New Zealand

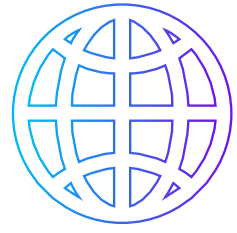
The world is facing increasing uncertainty through a dynamic geopolitical landscape, slowing economic growth and inflation. This is causing constraints on our supply chains in the New Zealand infrastructure sector. Added to this, countries have announced major infrastructure investment programmes which are competing for skilled labour and capital. On the ground, we are seeing this play out in delays, cost overruns and scope adjustments in our capital projects in New Zealand.

EBOSS Quarter 1 2023 Construction Supply Chain Report shows a '79% increase in the costs of materials over the last two years'<sup>(1)</sup>. The duration of major infrastructure investments mean that events beyond the control of local decision makers can drive costs far beyond initial estimates and can cause crippling financial burden to supply chains. For example, the recent liquidation of an Auckland base builder 'has left about 300 creditors owed an estimated \$14.9 million'<sup>(2)</sup>.

Although global events are far beyond our control, infrastructure projects must be suitably adaptable to changing global markets. Te Waihanga, New Zealand Infrastructure Commission has recommended a variety of options analysis tools which it describes as 'powerful tools for decision-makers; they provide insights into the probability of alternative outcomes occurring and what can be done to build robustness to uncertainty'<sup>(3)</sup>. Focus needs to shift to delivering outcomes rather than inputs. This will require an 'ecosystem approach' that involves collaboration from a broad range of private sector, academia, start-ups, technology companies, and service providers to deliver on initiatives.

# Infrastructure projects must be suitably adaptable to changing global markets.





# Globally, assets and services are becoming more digitised and easier to integrate.

## Addressing key skills shortages

Like many other global markets, New Zealand is grappling with a sustained skills shortage among key roles in the infrastructure sector. With Australia, the UK and America a magnet for talent with their own significant infrastructure pipelines, there is high likelihood that this will continue for years to come.

A recent Hays' report stated that '91% of employers are experiencing a skills shortage'<sup>(4)</sup> and the Civil Contractors New Zealand's 2023 Survey states that 'attracting, training and retaining skilled people remains the greatest challenge to the industry'<sup>(5)</sup>. Without a workforce equipped with the right skillsets to deliver our infrastructure projects, we will see significant delays and cost increases.

Similarly, infrastructure projects are facing difficulties in resourcing for key digital skills, resulting in missed opportunities to raise productivity and predictability.

Globally, assets and services are becoming more digitised and easier to integrate. This enables consolidation into a system-of-systems view which can provide unprecedented insight to planners and operators, and value to users and residents.

Further, covid fundamentally changed the workplace and modernised the working world. New Zealand, along with the rest of the world, must adapt to this: 'If New Zealand doesn't improve the digital skills of its workforce, we will continue to have low levels of productivity and ultimately more expensive, less competitive products competing in global markets'<sup>(6)</sup>.

When tackling the skills shortage challenge we must take a whole-of-lifecycle view. We don't just need people to build our assets, we must also consider the end users and operational staff who will be required to deliver services.



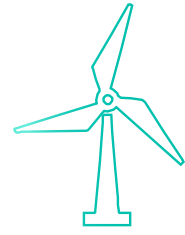


# 02

## Sustainability

How our sector is essential in the move towards a sustainable economy.





# Infrastructure investments must consider the sustainability of their projects from start to finish.

## New Zealand on the climate front line

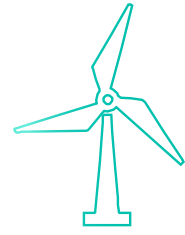
Cyclone Gabrielle and the Auckland flooding in early 2023 has brought the impacts of climate change to a personal level for many New Zealanders.

Events such as these are driving pressure to move from talk to action on climate change, with increasing frustration at the slow pace of emissions reduction and slow investment in adaptation across government.

Finance minister Grant Robertson blamed the extent of the damage inflicted by Gabrielle on New Zealand's failure to build infrastructure that is resilient to climate change, adding that the current approach to adapt "has not been sufficiently robust"<sup>(7)</sup>. Across New Zealand's entire infrastructure portfolio we must ensure we are both adapting existing infrastructure to meet the changing environment, and ensuring new investments have sustainability and resilience at their core.

KPMG's 2021 Net Zero Readiness report highlights energy and transport as key areas in which we have a real opportunity to drive a sustainable infrastructure model<sup>(8)</sup>. "Transport is responsible for almost half of New Zealand's carbon dioxide (CO2) emissions"<sup>(9)</sup>, and provides New Zealand with a real opportunity to reduce emissions by utilising green alternatives.





## Sustainability

There has been a recent focus on public transport, active transport modes and encouraging the uptake of electric vehicles, but there needs to be even greater buy-in and behavioral change. Decarbonising our transport systems also requires critical changes to our infrastructure such as improving the capacity of our grid to support EVs.

Fortunately, New Zealand is a global leader in renewables, and we are seeing increased investment across wind, solar and hydrogen. However, in order to achieve our 2050 emissions targets we must accelerate construction of the energy generation and transmission projects to accommodate forecast growth as we transition from fossil fuels. It is crucial that we start this pipeline of projects now to ensure that we can meet our emission reduction ambitions.

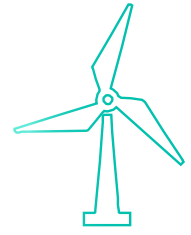
By maintaining our focus on a net zero 2050 target and the scale of the opportunity this presents, we can grab the attention of organisations in the renewables supply chain. Providing greater certainty to our domestic suppliers will also allow them to invest in the capacity and capability to deliver so that we aren't solely reliant on global players.

This year's weather events further highlighted the necessary improvements that must be made for improved and sustained resilience across all of our infrastructure. DPMC's (Department of the Prime Minister and Cabinet) recent market consultation highlighted that currently we have limited tools and a broadly decentralised approach, which had resulted in an inconsistent understanding of risks, standards, and a lack of co-ordination across our sectors.

Looking forward we must look at how we can adopt a more integrated, system-view to managing infrastructure.

**Decarbonising our transport systems also requires critical changes to our infrastructure.**





### Public & private sector responsibility

The drive towards a sustainable future must be both enforced by government through legislation, and implemented by the private sector through policy compliance and execution of new ways of working.

The private and financial sectors have a key role to play in achieving low-carbon growth. However they require clarity on government Net Zero policies. We must understand the business need for profitability alongside sustainable operating models to encourage key private sector players to support the drive towards a carbon neutral economy.

The current need for legislation to be the driver of institution change shows how strongly our current systems favours the status quo and how businesses willing to adapt and change require supporting regulatory environments to achieve this transition.

In January 2023, New Zealand passed legislation 'making climate-related disclosures mandatory for some large financial market participants'<sup>(10)</sup> which begins to address this system change. Policies such as this may need to be expanded across all sectors of infrastructure.

KPMG New Zealand's 2022 Survey of Sustainability Reporting shows that among New Zealand's top 100 companies 'climate change is the top priority, with just over 50% identifying this as a risk to their organisation, and 67% adopting a carbon reduction target'<sup>(11)</sup>.

If our sustainability initiatives are going to be met, it not only requires drive from government policy, but action from private sector organisations who deliver our major infrastructure programmes. Internationally, investors and funders are getting better at calculating the true value and benefits of their investments. This quantification of the specific and measurable benefits of sustainability will be the most powerful driver of long-term investment. New Zealand needs to recognise the greater scrutiny this will create over its development projects and also draw in the global knowledge and skills required to more appropriately characterise and quantify the broader benefits that will result from investment in more sustainable and resilient infrastructure.

**Among  
New Zealand's  
top 100 companies,  
climate change is  
the top priority.**





# 03

## Improving delivery

How we can use new technologies to understand requirements, plan investments and deliver projects.





## Improving delivery

### New technologies

Efficient delivery remains a challenge for many New Zealand infrastructure programmes and there is a role for technology to drive productive construction and asset management.

How we utilise technology and data to direct investments could help transform infrastructure planning and execution. A National Digital Infrastructure Model is being developed to harness this opportunity, but we are still trailing behind other jurisdictions when it comes to utilising these technologies.

New Zealand's infrastructure Commission states how 'openness to new technologies and methods also lifts productivity and reduces costs'. Further, it outlines New Zealand's ability and willingness to 'rapidly benefit from global improvements'<sup>(12)</sup>. We must embrace this and ensure our government, partners, and the broader supply chain understand the benefits of new approaches to help drive efficiency across the sector.

As new technologies are developed, how our infrastructure becomes interconnected will likely become the key focus in a shift to a system of systems approach. An example of this is the 'Wellington City Digital Twin – a digital copy and aspect of Wellington which can be used by the council, community, partners and contribute to a national digital twin'<sup>(13)</sup>.

Projects such as this show innovative methods that can give a full view of a city's complex and competing infrastructure needs, and the modern methods of mapping their interconnectedness. These technologies can help us better plan and analyse future investments and minimise risk.

# Openness to new technologies and methods lifts productivity and reduces costs.





# We must utilise technology advances to accurately map the requirements of end users.

## Requirements

The enduring impact of major infrastructure investments puts immense pressure on asset owners and operators to properly plan and adapt to the changing requirements of New Zealand's social landscape. The size, scale and duration of our biggest projects will have intergenerational impact<sup>(14)</sup>.

Infrastructure New Zealand has stressed the importance of communities becoming 'part of a planning process framed around robust empirical understanding of infrastructure and development capacity at the neighbourhood level'<sup>(15)</sup>.

This need for technology driven, community-based project planning has become even more pronounced at a local level in recent years. Cities and the people that populate them have changed entirely through the Covid 19 pandemic. The world is shifting from pursuing the impractical idea of creating a "15-minute city," to establishing "15-minute nodes" that will provide services to the people instead of requiring them to come to the city.

Infrastructure projects can span decades – often well beyond initial estimates – and the same can be said of cost. NZ Upgrade Programme is a primary example of such a change; an initial '\$5.6bn baseline estimate made in 2021' has now risen to 'an estimated \$10bn'<sup>(16)</sup>. It begs the question, 'Would the project ever have been approved had initial estimates been accurate?'

We must utilise technology advances to accurately map the requirements of end users, enabling better protection against cost increases and delayed delivery of benefits.





## Improving delivery

# Our sector must prepare for uncertainty in the delivery of our objectives and be ready to adapt.

## Financing major infrastructure

How we pay for infrastructure continues to be a fundamental constraint on the pipeline and delivery of infrastructure projects in New Zealand. We must remain flexible to a range of options to address the current investment deficit, and to build confidence in the forward pipeline to retain the capability and capacity of the sector at a time when skills are in high demand.

In recent years we have seen the implementation of new innovative funding and financing models that enable local government to deliver infrastructure projects. A recent example of this in which we were involved was the facilitation of the second transaction using the Infrastructure Funding and Financing Act. In this instance, KPMG acted for Crown Infrastructure Partners on the use of the IFF model to fund and finance the Sludge Minimisation Facility on behalf of Wellington City Council.

The project will enable much-needed wastewater treatment infrastructure to be built in Wellington, generating significant environmental and resilience benefits for levy payers. The transaction facilitates the financing of the project to sit outside of Wellington City Council's debt constraints thereby freeing up capacity to invest in other initiatives in the city.

The debate on how and who pays for infrastructure in the future is expected to continue, especially considering the growing list of mega projects such as Auckland Light Rail, City Rail Link, Let's Get Wellington Moving and the alternate harbour crossing.

Moving into 2024 we anticipate an increased focus on developing new revenue streams, with both major political parties currently looking at ways to generate new revenues through various initiatives such as value capture, targeted levies, and tolls.





## Improving delivery

### Increasing productivity and predictability in delivery

We don't have to look far to read the latest story of a capital project running behind schedule or over budget. This is especially problematic at a time when Infrastructure projects have never been more in the spotlight.

As a sector, we must move the dial on productivity and predictability if we are to deliver the critical infrastructure required for New Zealand to prosper. There are several areas where we can look to drive positive change including appropriate governance, raising sector capability, and use of project data from both overseas and domestic projects.

Effective governance requires clear accountabilities, responsibilities and decision-making rights through delegated authorities. It also relies on appropriate reporting to ensure stakeholders have the right information for timely and effective decisions to be made. However, as our projects get larger and more complex, we must ensure we address the balance of managing the intended outcomes, without burdening projects with cumbersome processes.

Looking forward, successful project governance requires thorough preparation, including strategic planning, transparent prioritisation mechanisms, and decision-making procedures based on affordability, cost-efficiency and outcome delivered<sup>(17)</sup>. This is reinforced by Te Waihanga's recent review of the City Rail Link (CRL). It found that all future major infrastructure projects should have appropriate Programme Management governance structures in place at project initiation<sup>(18)</sup>.

# We must move the dial on productivity and predictability to deliver critical infrastructure.





# When it comes to raising capability around project delivery, we don't need to reinvent the wheel.

When it comes to raising capability around project delivery, we don't need to reinvent the wheel. There are many jurisdictions that we can look to for developed frameworks and toolkits such as the UK IPA Routemap and Construction Playbook, or the Assessment Framework developed by Infrastructure Australia.

Locally, Te Waihanga has signaled their intention to uplift capability by developing a leadership programme focussed on fostering the critical capabilities of senior Public Sector project leaders. This could drive cross agency collaboration and cohesion, enable delegates to learn leading best practices and explore solutions to real problems facing their respective projects.

We can also look at our own past to improve delivery as there is a wealth of lessons to be learnt and data to process. However, to date, we have not utilised this information to its full potential. If we invest in the standardisation and digitisation of project data, we could improve efficiency through informed and proactive risk management, and predictability through Reference Class Forecasting.

Similarly, this knowledge could be used to standardise construction practices. For example, we do not need to design bespoke wards for each new hospital. Instead, we can use modern methods of construction and repeatable designs that harness the power of offsite manufacturing to be cheaper, faster, and greener.





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