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Infrastructure

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BUILDING BACK BETTER

Inside

Infrastructure

ReBuilding Nations Symposium 2020

In times of crisis and transformation, leadership and shared vision is more important than ever. The 2020 ReBuilding Nations Symposium will commence with recognised leaders sharing how they're working to seize the opportunities from Covid, to transform and thrive.

The Government has announced a significant tranche of investment to kickstart the economy post-Covid-19, and infrastructure will be at the very heart of the recovery. This is our chance to reposition New Zealand's economy for coming decades so that it is more productive, inclusive and sustainable. Infrastructure New Zealand's 2020 ReBuilding Nations Symposium will bring together many of New Zealand's leading infrastructure minds to share their perspectives how we Build Back Better.

Key themes of the Symposium include:
- Climate change, resilience and sustainability
- The infrastructure pipeline
- Transformative leadership
- Infrastructure funding
- Improving housing
- Data and digital infrastructure
- Planning for outcomes
- Reforming water
- The future of transport
- Social infrastructure.

Keynote Speakers:
- Rt Hon Jacinda Ardern, Prime Minster of New Zealand
- Hon Grant Robertson, Deputy Prime Minister, Minister of Finance, Minister for Infrastructure
- Hon Nanaia Mahuta, Minister for Local Government, Minister for Foreign Affairs
- Dr Siouxsie Wiles, Associate Professor, University of Auckland
- Dr Caralee McLiesh, Secretary to the Treasury
- Jo Hendy, Chief Executive, Climate Change Commission
- Nicole Rosie, Chief Executive, Waka Kotahi, NZ Transport Agency
- Vui Mark Goshe, Chair, Kainga Ora – Homes and Communities
- Ross Copland, Chief Executive, Te Waihanga, Infrastructure Commission
- Bill Bayfield, Chief Executive Taumata Arowai (Water Services Regulator)
- Shamubeel Eaqub, Partner, Sense Partners and many more.

Panellists:
- Sir Stephen Tindall, Founder and Trustee, The Tindall Foundation
- Andrew Crisp, CEO Ministry of Housing and Urban Development
- Susan Freeman-Greene, Chief Executive, Local Government NZ
- Dame Paula Rebstock, Independent Director
- Fraser Whineray, Former Chair, Prime Minister's Business Advisory Council
- Paula Southgate, Mayor of Hamilton
- Tenby Powell, Mayor of Tauranga
- Sheryl Mai, Mai of Whangarei
- Hamiora Bowkett, Deputy Chief Executive, Te Puni Kokiri
- Murray Sherwin, Chair NZ Productivity Commission and many more.

INSIDE INFRASTRUCTURE 2020

ReBuilding Nations is the key forum for the infrastructure sector to come together to progress thinking and advance best practice in national infrastructure development.
18-19 November
Auckland
Sessions posted at www.infrastructure.org.nz/BNS-2020
in a week's time.

INFRASTRUCTURE

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Infrastructure

'The Prime Minister has been very clear with me in appointing me as Minister of Infrastructure that she wants me to have an overview of the way we approach infrastructure.

First, we are going to have a focus this term in making sure that we both have a pipeline of projects and also a consistent means of monitoring of our delivery of them. I want to work in partnerships with everyone involved in that.

Second, I've got a job to do on behalf of taxpayers but I recognise that I can't do that unless there is a good partnership with the sector.

My track record over the last three years is to have been open to those conversations as Finance Minister, and, I want to do that as Infrastructure Minister.

I feel like some good work was done in the last term both to build a platform for the way in which we deliver infrastructure but also have a good solid long-term plan.

For example, the creation of the Infrastructure Commission, the passing of the Infrastructure Funding and Financing Act, the broader work on the Urban Growth Agenda, the National Policy Statement on Urban Development and the work we did on the NZ Upgrade Development Programme and the Infrastructure Reference Group. For me, it is about making sure that we both deliver on what we have said we are going to do and continuing that work of creating the pipeline and the Government playing its role as an enabler of developments.

Individual ministers are responsible for their areas. But having someone who can bring it all together is really important.'

Grant Robertson, Deputy Prime Minister and Finance Minister

Infrastructure

It's time to redefine 'normal'

> As we progress through the Covid response, it's imperative that we continue to shed some of the bureaucratic baggage we have accumulated over the years.
>
> Ross Copland

As a nation we have shown we are often at our finest in a crisis. Our response to the Kaikoura earthquake saw rapid mobilisation of a specialist workforce to execute $1.2 billion of civil works in just 12 months.

A planning, consenting and procurement process that would usually have taken years was compressed into weeks. The social, environmental and economic outcomes generated by this effort is a result the NCTIR (North Canterbury Transport Infrastructure Recovery) team and their supporting agencies which they can all be very proud of. They proved that speed, quality and environmental stewardship are not only possible, but essential ingredients in a successful response to an infrastructure crisis.

New Zealand has been praised around the globe for its management and response to the Covid-19 pandemic. Our political leaders stuck to the mantra of "go hard and go early" to beat Covid-19, and New Zealanders gave up unprecedented liberties and livelihoods in doing their part to halt the virus. The public and private sectors worked together on initiatives like Shovel Ready Projects and stimulus investment in water infrastructure. First and foremost, the wellbeing of Kiwis has been the focus and it has paid off so far.

Covid has taken a toll on New Zealand, and its full implications haven't yet been felt. Much like the months of aftershocks following the Christchurch earthquakes, the periodic outbreaks of Covid have kept Kiwis well-grounded in the reality of the threat we continue to face to both our social and economic wellbeing as the virus rages on in many corners of the globe.

This crisis has seen us find new ways through some of the cumbersome bureaucracy that places "process" ahead of "progress" with the RMA Fast Track legislation one example of a concerted effort to bring a Kaikoura-like focus to the response.

I recently took part in a seminar with our water sector where I was informed consent costs have reached 25 per cent of the capital value of significant water projects, a staggering figure roughly five times the contractors profit margin for actually building a typical project of this nature.

As we progress through the Covid response, it's imperative that we continue to shed some of the bureaucratic baggage we have accumulated over the years. It's essential that we take this opportunity to redefine "normal".

The New Zealand Infrastructure Commission, Te Waihanga, is determined to make the most of this opportunity to capture the best elements of our crisis-response success to redefine the way we plan, pay for and build infrastructure over the next three decades.

We were founded in 2019 to improve the wellbeing of New Zealanders through better infrastructure. As the Government's lead advisor on infrastructure, we have been deliberately structured as an Autonomous Crown Entity with a bipartisan, objective view of how best to address the significant infrastructure deficit we face here in New Zealand.

Sense Partners1 report that the investment deficit may be as high as 25 per cent of GDP, or $75b — a truly staggering figure representing nearly double the total value of investment intentions currently published in our Infrastructure Pipeline.

We are currently working to deliver a 30-year Infrastructure Strategy for New Zealand.

This will be delivered to the Minister for Infrastructure in September 2021, and work is well underway, but we don't have all the answers and we can't do it alone.

This is your strategy New Zealand; we're just holding the pen. So please take the opportunity to engage and share your views as the opportunities arise, and arise they will with a busy programme of engagement activity ramping up over the next six months.

Tell us what you think "normal" should look like, how much you think is fair to invest in consents for a new home, or what you would prioritise between alleviating congestion or improving water quality.

In addition to the 30-year Strategy, resource management and three waters reform, delivery of major infrastructure projects like Dunedin Hospital will be top priorities as we welcome the new Government.

Looking ahead, Te Waihanga remains very concerned about the economic health of the construction sector and is supporting various initiatives through the Construction Sector Accord and engaging in our own primary research to monitor this closely.

Projects approved as part of the $3b "shovel ready" stimulus and the first tranche of water reform investments need to get under way urgently in order to secure jobs and retain our skilled people. Te Waihanga is working with urgency to get these projects into our pipeline in order to keep the market informed of the likely delivery programme by project, sector, client and region.

So there's plenty to do. Let's make sure we don't waste what we have learned from this and previous crises, and that we continue to innovate and focus on delivering the infrastructure we need to live the lives we want.

Most important of all, is that you take a moment to articulate the new normal you want for New Zealand and the legacy you want to be remembered for when we look back from 2050 to the smart decisions that were made today.

● *Ross Copland is chief executive of the NZ Infrastructure Commission, Te Waihanga.*

Infrastructure

Into the future at a fast pace

Grant Robertson is excited about the infrastructure portfolio and says shovel-ready is in the eye of the beholder

Infrastructure
Fran O'Sullivan

Grant Robertson is relishing getting his hands around the all-encompassing portfolio of infrastructure, adding it to his prime role as Minister of Finance.

It is critical to the success of the second term of the Ardern Administration that the Government makes quick pace on the infrastructure agenda.

It has to put the failure (for example) to deliver on KiwiBuild promises behind it, make good on project timelines and put a reputation for being "bad on execution" behind it.

Robertson is critical to that.

At his Beehive office, the Infrastructure Minister told the *Herald* that the New Zealand Upgrade programme was a top priority. "It is really hard to remember but it was only at the end of January this year that we grabbed a set of projects and said we want to move this forward.

"But that piece of work is a top priority for me to actually make sure it is rolling out properly."

The $12 billion NZ Upgrade Programme, announced on January 29, will result in rail, roads, schools and hospitals being built and upgraded across the country.

"Clearly Covid-19 has intervened in our ability to get them rolling as fast as we could," says Robertson. "But good work has been done and it does actually need those big horizontal construction projects to move forward in coming years.

"There is actually a lot of work there which is good."

It must have been seriously frustrating for Robertson (at times) during the last parliamentary term with former New Zealand First MP Shane Jones holding the important infrastructure portfolio.

The pair had a good working relationship.

But Jones was famously flammable when it came to dealing with those in the business sector who he felt were standing in the way of progress.

Example One: NZ First's proposal to shift the Ports of Auckland to Whangarei which was hived off to a working group headed by Northland businessman Wayne Brown. The Upper North Island Supply chain project recommended the move.

But Mayor of Auckland Phil Goff did not take kindly to being presented with a fait accompli. Port officials were also singled out.

The Ministry of Transport says that finding a solution for the upper North Island supply chain strategy has issues and implications. Officials have deferred providing any further policy analysis until 2021.

Example Two: Jones publicly poured cold water on the proposed light rail project for Auckland which had been pledged by Labour at the 2017 election.

He used a speech to an Infrastructure Commission conference in late February to say cost increases in the City Rail Link "makes me very, very cautious about light rail".

Robertson has made the point that Jones was referring to expected costs which lay with the NZ Super Fund — not directly with the Crown. But because the prior Coalition partners could not agree on a preferred light rail option that also has been kicked into 2021.

He is diplomatic when responding to the *Herald's* tease that it must be so much simpler operating in what is to all intents and purposes a First Past the Post (FPP) environment.

A key focus for Robertson is a bunch of Covid-19 recovery programme projects which were chosen by an Infrastructure Reference Group (IRG) with leadership from Crown Infrastructure Partners chair Mark Binns.

> Good work has been done and it does actually need those big horizontal construction projects to move forward in coming years.

These "shovel-ready" projects were designed to provide some fiscal stimulus to the NZ economy in the wake of the Covid-19 lockdowns and importantly, more jobs.

"We are very fortunate in the way that Crown Infrastructure Projects have done their job there," says Robertson. "They're very competent — there's giant spread sheets spread out and lying around with quarterly updates — so it's good.

"It's really good. Just making sure that that actually plays out and does what we said it would."

"Bear in mind with IRG, that shovel-readiness is in the eye of the beholder. We set ourselves a timeline where every project has to have a start date.

"I have the joy of looking out the Beehive window at the Cathedral which is one of the projects.

"You can see the white around it — that's an IRG project. So, it's happening."

In Robertson's view, the vertical construction sector probably has more than they can cope with right at the moment.

But with horizontal infrastructure the timeframes are a lot longer — "they are talking what is happening in 18 months because they have got workforces to deploy."

Here's his take on some key issues:
Robertson had yet to meet with new Transport Minister Michael Wood when the *Herald* interviewed him last Friday.

Light rail is definitely on the Government's work programme, he assures the *Herald*. "There are lots of reasons why we didn't (last term) but look to the future here. We have laid the platform for this."

Herald: So, you would want to make progress on it this parliamentary term? Robertson: Absolutely.

Infrastructure Funding
Crown Infrastructure Partners, under its Act, can identify where opportunities are.

It is designed to be able to create a different way of both providing the financing and creating revenue streams that are needed to support that.

Robertson cites the Milldale housing project which CIP started as a good example.

"If we are going to crack the housing challenge in NZ we have to be better at this way of doing this kind of development," he says.

"The whole point of this is to lift this off the balance sheet of central government and local government and put it into those special purpose vehicles and drive it forward."

RMA reforms
Robertson is in close contact with Environment Minister David Parker on the RMA Reforms to ensure they facilitate infrastructure the Government wants to progress.

A key factor is to make sure that critical interests are considered. "Last term, we did National Policy Statements on urban development and on elite soils together," says Robertson. "They went through Cabinet together and it was really good. You can think about how a city is growing okay. But also ensure Pukekohe still does potatoes.

"We want to protect wetlands; we want to protect elite soils, but we also want urban development."

Getting apprentices into building
There's been a big boost to apprenticeship training, with 6500 new apprentices this year compared to around 2000 in the prior year.

Robertson concedes getting infrastructure specialists into NZ is a constant challenge. A BusinessNZ group is working with Immigration Minister Kris Faafoi on that.

The Prime Minister has said about 10 per cent of MIQ positions at the border will be reserved for economically significant workers.

PPPs — in favour?
Robertson is open to private public partnership — particularly in transport. But some have thrown up big challenges like Transmission Gully.

He wants to see the NZSF, ACC and institutional investors play a role in funding large scale investments.

Robertson with PM Jacinda Ardern. The Government has spearheaded a big boost to apprenticeship training.

Ministry takes stock of risks we are facing

The Ministry of the Environment's first National Climate Change Risk Assessment is a stocktake of the climate change risks facing New Zealand.

It looks at the climate change hazards that present the most pressing risks for New Zealand. The report identified 43 risks; 10 need urgent action. The report's scope is broad. Coastal ecosystems and drinkable water supplies are on the urgent list. So is the increase in social inequities.

While direct threats to infrastructure don't feature in the urgent action list, the sector is in the front line. Built infrastructure is especially vulnerable to rising sea levels. Local Government New Zealand, a lobby group representing councils, estimates rising sea levels threaten up to $14b of ratepayer-owned infrastructure.

The report lists potential damage to tourism from changes to the landscape and ecosystems and impact on lifeline infrastructures such as energy and water networks among its priority risks. The rail, roads and airports that let tourists reach their destinations are all vulnerable to rising sea levels and other climate-related hazards. The report says the annual cost of repairing land transport networks damaged by weather events has more than quadrupled in the last decade.

There are risks to ports and associated infrastructure from extreme weather and rising sea levels. Associated infrastructure, such as petroleum storage in coastal areas, could also be at risk. Our electricity infrastructure faces a threat from temperature changes, rainfall, other extreme weather and increased fire danger.

Water supplies are sensitive to climate change. It's not only the design and size of key water infrastructure, but the location of reservoirs may need to change as rainfall

> The report's scope is broad. Coastal ecosystems and drinkable water supplies are on the urgent list. So is the increase in social inequities.

patterns shift. At the same time, water requirements are likely to be different with rising temperatures causing more evaporation and the need to deal with drought. The report points out that higher temperatures and drought can also lead to algal bloom which contaminates water sources.

Other risks to wastewater and stormwater systems that are projected to become more frequent and severe due to climate change include inland and coastal flooding, coastal erosion and rising groundwater.

The impact of these could include more wastewater overflows to waterways and harbours, reduced service levels for stormwater networks due to higher rainfall, and urban pollutants entering downstream environments.

Another area that gets attention is the economic cost of the need to adapt infrastructure to changing circumstances. The report says this will place a growing financial burden on public authorities. Yet for some councils any further investment is constrained because they are approaching covenanted debt levels. They have a limited capacity to respond to climate change risks.

The report says some councils have disaster relief funds in place or have already budgeted for higher infrastructure costs, yet other councils remain unsure about the potential costs and how they will meet them. Changes in the frequency and intensity of extreme weather events is already having an effect on insurance premiums.

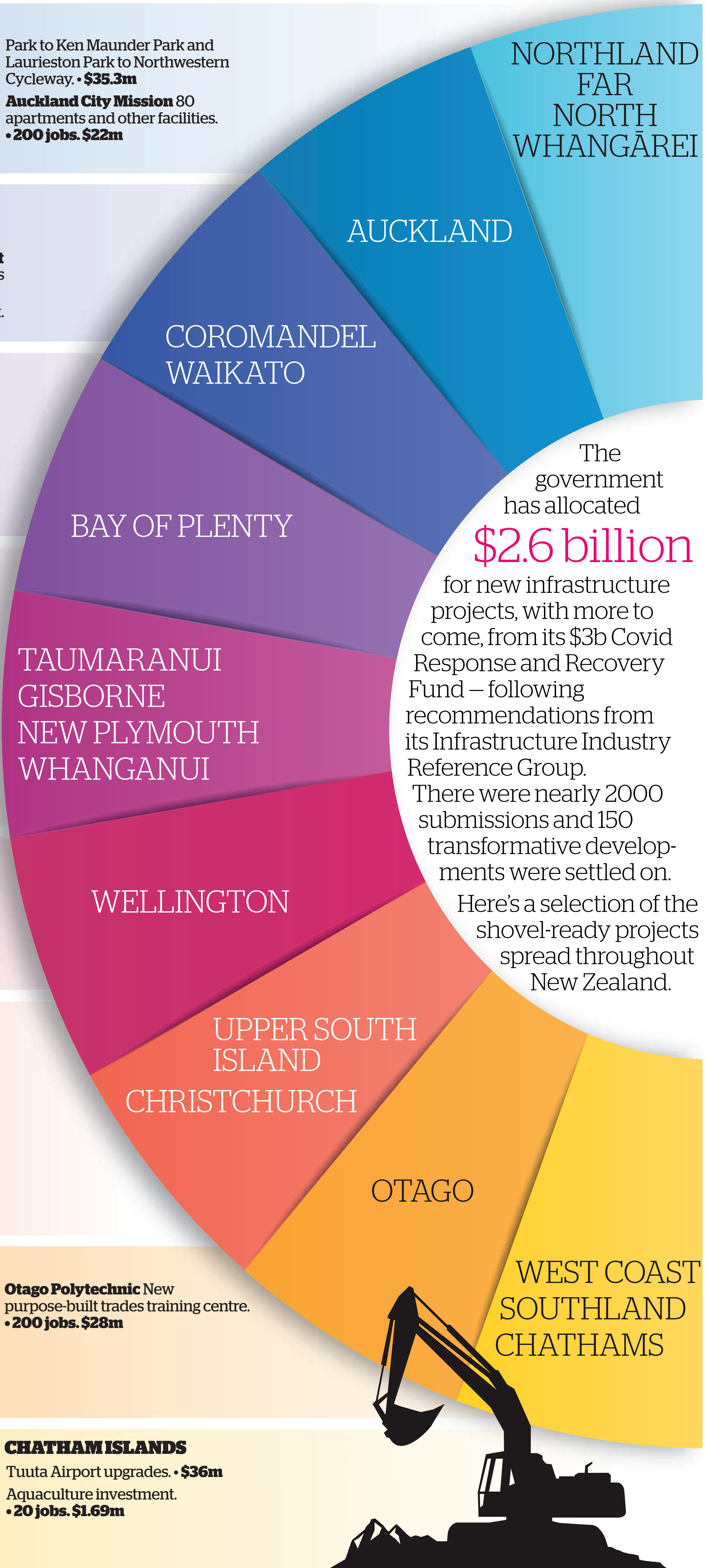
In its own words, the NCCRA report: "Combines scientific, technical and expert information with Mātauranga Māori, local knowledge and experience".

The 2019 Climate Change Response Amendment Act requires the ministry produce the report. It will update every six years. A national adaptation plan is due two years after each risk assessment cycle.

— *Bill Bennett*

Covid recovery projects: A quick guide

The government has allocated **$2.6 billion** for new infrastructure projects, with more to come, from its $3b Covid Response and Recovery Fund — following recommendations from its Infrastructure Industry Reference Group. There were nearly 2000 submissions and 150 transformative developments were settled on. Here's a selection of the shovel-ready projects spread throughout New Zealand.



NORTHLAND/FAR NORTH

Whangārei Cultural centre, new shared paths, sporting and trades training facilities. **• Creates 200+ jobs. $20m**

Far North Roading and flood protection projects. **• $27m**

Kaipara Improving roads, stopbanks, flood resilience and water management in Raupo District. Cycle and walking track along former rail corridor from Dargaville to Donnellys Crossing. **• 135 jobs. $16m**

Kerikeri Includes Rangitane Wharf rebuild, new Domain facilities and other civic amenities. **• 100 jobs. $9m**

Far North District Council Cycle trail and shared path from Ahipara to Te Rerenga Wairua (Cape Reinga), along 90 Mile Beach. **• 80 jobs. $7m**

Paihia Waterfront. **• 60 jobs. $8m**

Mangonui Waterfront **• $6.5m**

Mangawhai 8km Shared pathway, two new footbridges, rebuilding historic wharf. **• $3.75m**

Upgrading Pukenui Wharf on Houhora Harbour. Replacing Unahi Wharf at Awanui. **• 36 jobs. $2m**

AUCKLAND

Auckland University's Faculty of Education and Social Work build. Work to start before Christmas. **• Create 750 jobs. $200m**

Wastewater upgrades, for **Kainga Ora Mangere, Mt Roskill, Tamaki. • $115m**

Unitec Housing development. 4000 new homes. **• 250 jobs. $75m**

Ferry Basin redevelopment, creating six new berths on the west side of Queens Wharf. **• $50m**

Puhinui Station upgrade. **• $47.1m**

Te Whau Pathway extension. Olympic Park to Ken Maunder Park and Laurieston Park to Northwestern Cycleway. **• $35.3m**

Auckland City Mission 80 apartments and other facilities. **• 200 jobs. $22m**

COROMANDEL

Kopu Marine Precinct Alternative options for vessels from the Hauraki Gulf, Coromandel, Taurangaa, Auckland and Whangarei. **32+ jobs**, with potential for more than 100 downstream jobs when finished. **• $8.2m**

WAIKATO

Taupō Town centre transformation. **• 92 jobs. $20m**

Plus **Eastern Urban Lands Development** Residential housing, commercial buildings and community facilties. **• $8m**

Ruakura Inland freight port development. **250 jobs. $40m**

BAY OF PLENTY

Rotorua SH30 upgrade and Wharenui Rd. **• 300 jobs. $55m**

Rotorua lakefront Wai Ariki Hot Springs and Spa complex build. **• 460 jobs. $38m**

Rotorua St John Ambulance hub. **• 120 jobs. $11m**

Taheke Geothermal Power Station. Construct an exploratory geothermal well. **• 190 jobs. $11.9m**

Ōpōtiki Town centre development, including a marina and industrial park. **• $20.7m**

Omokoroa Roading and water infrastructure upgrades. **• $14m**

CENTRAL NORTH ISLAND

Taumarunui New housing on council land. **• $7.78m**

Northern Te Tairawhiti. A marine transport facility. **• $45m**

Gisborne Grandstand at Rugby Park. **• 30 jobs. $8m**

New Plymouth Wastewater Treatment plant. New facility will be fuelled by a blend of natural gas and green hydrogen, reducing the carbon footprint by 500 tonnes per year. **• 77 jobs. $37m**

New Plymouth's Yarrow Stadium repair. **• 150 jobs. $20m**

New Plymouth Green School NZ expansion. **• 200 jobs. $11.7m**

Whanganui Police hub including justice and social services agencies. **• $25m**

Marton Rail hub. **• 100+ jobs. $9.1m**

Levin 2500 new dwellings in Taraika. **• 280 jobs. $25m**

Horowhenua Business park stage 1. **• $2.9m**

WELLINGTON

Upper Hutt Sports science and training facility at the NZ Campus of Innovation and Sport. **• $30m**

Upper Hutt Multi-purpose Maidstone sports park. **• $12m**

Naenae Pool and Fitness Centre new build. **• 200 jobs. $27m**

Lower Hutt 4.4km Eastern Bays shared path from Point Howard to Eastbourne. **• $15m**

Masterton Hood Aerodrome upgrade. **• $10m**

UPPER SOUTH ISLAND

Blenheim Art gallery and library. **• 30 jobs. $11m**

Golden Bay Port Tarakohe redevelopment. **• $20m**

Picton to Blenheim Cycle and walking trail First stage of200km Picton to Kaikoura trail. 42 jobs and about 130 indirect jobs through increased tourism. **• $18m**

CANTERBURY

Christchurch Cycling routes. **• $71.5m**

Christchurch YMCA refurbishment. **• $43m**

Waltham New rail maintenance facility. **• $39m**

Ashburton District library and civic centre. **• $20m**

Christchurch Coastal Pathway from Redcliffs to Shag Rock at Moncks Bay. **• 100 jobs. $15.8m**

OTAGO

Lake Onslow Bring forward by five years 100% renewable electricity. **• $100m**

An additional $70m to accelerate the second stage of a pumped hydro storage scheme. The Lake Onslow scheme would store 5000GWh — about an eighth of the country's total annual power use.

Queenstown Town centre upgrade. **• 320 jobs. $85m**

Plus Public transport hub. **• 100 jobs. $25m**

Otago Polytechnic New purpose-built trades training centre. **• 200 jobs. $28m**

WEST COAST

Omoto Improve Christchurch to West Coast rail connection. **• 20 jobs. $13m**

Greymouth, Westport & Jackson Bay Wharf and port infrastructure development. **35 jobs. $7m**

SOUTHLAND

SH94 between Te Anau and Milford Sound. Homer Tunnel improvements. 180 jobs. **• $25m**

Invercargill Inner-city development. **• 350 jobs. $10m**

CHATHAM ISLANDS

Tuuta Airport upgrades. **• $36m**

Aquaculture investment. **• 20 jobs. $1.69m**

Infrastructure 2020 / Herald Network graphic

Infrastructure

Regions kick-start a rebuild

Infrastructure
Graham Skellern

The Government set aside $3 billion in its Covid Response and Recovery Fund prompting a rush of applications for new projects to be included in the infrastructure investment pipeline.

The upgrade of the Manukau Puhinui Station into a major bus and train interchange will move ahead; infrastructure development at the Carrington Rd Unitec site will fast-track the building of 4000 homes.

The recently established Infrastructure Industry Reference Group has facilitated an impressive array of projects that are regionally focused and designed to enhance community economic wellbeing in the Covid-19 rebuild.

The reference group, headed by Crown Infrastructure Partners chairman Mark Binns, worked its way through 1924 submissions with a combined value of $134b from local councils, other organisations, and businesses — the submissions represented 40 sectors of the economy. The infrastructure sector makes up about 13 per cent of the national economy and directly employs more than 500,000 people.

Working hastily, the group produced a shortlist of 802 projects and initially 150 new projects worth $2.6 billion were approved by Cabinet. These projects were shovel-ready or likely to be by the end of the year. They will create a pipeline of work running through to the end of 2022.

The projects range from a shared cycling and walking path along 90 Mile Beach toe Reinga in the Far North to an Invercargill inner-city development in the Deep South.

On the East Coast of the North Island, officials are working with iwi, local businesses and coastal shipping operators to develop a marine transport facility in northern Te Tairawhiti and move goods by sea, reducing the amount of freight and trucks on the road.

Even Chatham Islands got in on the act. The islanders received $36 million to upgrade their Tuuta Airport and be in a position to receive more visitors and increase tourism. The airport's runway will be lengthened and strengthened, and the terminal, lighting and fencing will be upgraded.

The interesting mix of projects make up most of the Government's $3b Covid Response and Recovery Fund designed to create more than 20,000 jobs and unlock more than $5b worth of projects across New Zealand.

About $400m has been held in reserve, and in most cases the project promoters — councils, other organisations, and businesses — need to provide some matching funding. The new projects are additional to the Government's $12b New Zealand Upgrade Programme and existing Provincial Growth Fund infrastructure investments.

Finance and now Infrastructure Minister Grant Robertson pledged when announcing the new projects: "This is about creating jobs as we recover and rebuild from the recession caused by the global Covid pandemic.

"Because we went hard and early with our health response, we've been able to open up the economy quicker than other countries and get a head start on our recovery.

"Building infrastructure is a key component of our economic recovery plan. It creates jobs and provides much-needed economic stimulus. There's a range of ways we get benefit from these projects — firstly during the construction phase, secondly when facilities opened and finally providing ongoing employment," Robertson said.

The reference group zeroed in on key sectors that are central to the Government's economic plan — housing and urban development, climate resilience, energy, and community development.

The funding allocations were also based on analysis where the impacts of Covid were felt the hardest in different regions. For instance, Infometrics told the reference group that Otago gross domestic product would decline 10 per cent and Queenstown 23 per cent; West Coast 9.5 per cent; and Auckland less than 9.5 per cent.

Robertson said the number and range of submissions had given the Government a greater understanding of the pipeline of projects right across New Zealand.

The reference group was also joined by NZ Transport Agency chairman Sir Brian Roche, KiwiRail chief executive Greg Miller, and Infrastructure Commission chairman and former Reserve Bank governor, Dr Alan Bollard. They operated alongside the Provincial Development Unit which has spent the past two and a half years working with regions and was well placed to identify shovel-ready projects.

The Covid Response and Recovery Fund (CRR) allocated $460m to environmental, $464m to housing and urban development, $670m to community and social development, and $708m to transport (cycleways, walkways, ports and roads).

Within that allocation, $210m went to climate resilience, water storage and flood protection, $155m for transformative and sustainable energy projects, about $180m for construction projects, and $50m for enhanced regional digital connectivity.

The new projects were spread around. Northland and the Far North received a total of $150m, Auckland $500m, Waikato $150m, Bay of Plenty $170m, East Coast $106m, Hawke's Bay $130m, Taranaki $85m, Manawatu/Whanganui $140m, Wellington region $185m, Top of the South Island $85m, Canterbury $300m, West Coast $90m, Otago $260m, and Southland $90m.

Housing and moving around the city was again a priority for Auckland. The Covid Recovery and Response Fund allocated $75 million for infrastructure development at the Carrington Rd Unitec site to fast-track the building of 4000 homes. There is also $115m for water main and wastewater upgrades in Mangere, Mt Roskill and Tamaki to pave the way for new housing. The Auckland City Mission's HomeGround project, now the recipient of $22m government grant, is building 80 apartments for people direct from the social housing register — the mission expects to have more than 2000 people living there over the next 25 years.

Down south, YMCA Christchurch, which received $43m, is refurbishing its accommodation and building a new facility featuring pre-school, theatre, dance studios and offices for youth groups.

The city mission development in Hobson St has started and will include 25 detox beds, a dental clinic, pharmacy, retail and community spaces, and conference and events facilities for all Aucklanders. The mission has now raised nearly all of the $110m development cost.

The upgrade of the Manukau Puhinui Station into a major bus and train interchange will move ahead with the allocation of $47.1m — and at the completion of the development buses will run to Auckland airport every 10 minutes.

The Te Whau Pathway is being extended for $35.3m and once completed will pass through 33 reserves, sports parks, schools and communities in Green Bay, New Lynn, Avondale, Kelston, Glendene and Te Atatu.

Auckland University has received $200m for its new Faculty of Education and Social Work at its central campus, and construction is expected to start by the end of the year, creating 750 jobs.

Other housing and urban projects outside Auckland include:

- The Eastern Urban Lands development by Penny Homes in Taupo, a mix of residential and retirement housing, commercial buildings, walkways and community facilities (allocated $8m government loan).
- Upgrading State Highway 30 and stormwater to open up 1100 sections in Wharenui Rd, Rotorua ($55 million).
- Roading and water infrastructure upgrades in Omokoroa near Tauranga for new housing and growing the community from 4000 to 12,000 residents ($14m).
- Taraika development in Levin for 2500 new dwellings ($25m).
- Ruapehu District Council's housing options programme starting with new homes on council land in Taumarunui ($7.78m).

A feature of the CRR projects is the town and city centre revitalisations up and down the country. Whangarei has $20m for a new cultural centre and shared paths. Taupo has $8.2m to reconfigure its street network in the town centre and turn one into an "eat street."

Blenheim received $11m for its new Art Gallery and Library and Ashburton was allocated $20m for its new library and civic centre. More than a $100 million has gone into upgrading the Queenstown town centre — first by developing arterial routes around the centre to reduce congestion and adding street-scaping, cycle and walkways, and then building a public transport hub.

Invercargill, the recipient of $10m, is developing an inner-city dining and retail precinct, covered car park with 625 spaces, new offices and apartments to attract an additional 1500 people in the city centre every day.

There's lakefront development at Rotorua with the Wai Ariki Hot Springs and Spa complex ($38m), at Okere Falls where the Taheke Geothermal Power Station will construct an exploratory geothermal well ($11.9m), and at Lake Onslow in Otago for the second stage of a pumped hydro storage scheme which would store 5000GWh ($70m).

And there's plenty of waterfront and harbour development. Paihia in the Bay of Islands was allocated $8m to construct breakwaters and restore its beach after years of erosion, and further north Mangonui ($6.5m) is opening up access to the harbour and improving the water quality.

The Ferry Basin redevelopment in Auckland received $50m and will help create six new berths on the west side of Queens Wharf. Kopu near Thames ($8.2m) is revamping its marine precinct and providing alternative marine-servicing options from the Hauraki Gulf, Coromandel, Tauranga, Auckland and Whangarei.

Golden Bay's Port Tarakohe ($20m) is having a make-over with more working wharf space for the expected surge in mussel production, a harbour master building and access to commercial marine berths.

Greymouth, Westport and Jackson Bay received a total of $7m for wharf and port infrastructure development to improve servicing of regional fishing and bulk industries, including a boat repair and maintenance hub at Greymouth.

Two inland freight ports were on the radar with $40m allocated to Ruakura in Hamilton for roading and water infrastructure, and $20m to Whakatu near Hastings with direct road and rail connections to Napier Port. A new Marton rail hub ($9.1m) will provide more efficient log transport in lower North Island.

The Masterton Hood Aerodrome received $10m for upgrading its runway and taxiway and lighting, and Air Chathams has indicated it could operate domestic services from the airport.

Sport and leisure were beneficiaries. Land at Waipapa near Kerikeri is being developed for a sports hub; the grandstand and pavilion at the Kerikeri Doman is being rebuilt; a new grandstand at Gisborne's Rugby Park; a regional aquatic centre ($32m) is being established near Hastings; New Plymouth's earthquake-prone Yarrow Stadium ($20m) is being repaired; the Naenae Pool and Fitness Centre ($27m) in Lower Hutt will be reopened as a state-of-the-art facility; and a new sports science and training facility ($30m) is being added to the New Zealand Campus of Innovation and Sport in Upper Hutt.

One of the more transformative environmental projects, along with the Okere Falls and Lake Onslow developments, is the thermal drying facility ($37m) at the New Plymouth wastewater treatment plant.

The new facility, which will be fuelled by a blend of natural gas and green hydrogen, processes bio-solids from sewage and turns them into household fertiliser.

The carbon footprint will be reduced by 500 tonnes per year.

THE NUMBERS

$460m
environmental.

$464m
housing and urban development.

$670m
community and social development.

$708m
transport (shared paths, ports and roads).

Infrastructure

Wood: Let's get transport moving

Infrastructure investment will be a critical element of the recovery and rebuild from Covid-19, says minister

Infrastructure
Tim McCready

Newly appointed Cabinet Minister Michael Wood has high ambition for his transport portfolio. Some of the top-line goals he says are priorities, are to get the city moving, improve freight connections, safety, and progress decarbonisation.

"A lot of this work was set up in the last term, I really see this term as about driving those things through in a practical way and getting them done through projects and programmes," he says.

Wood says the additional components since the Government's last term is the "build back" aspect — the fact that infrastructure investment will also be a critical element of the economic recovery and rebuild from Covid-19.

"We are looking at a $54 billion transport pipeline over the next ten years that we're able to deliver and that is going to be really significant on the jobs front, on the skills development front, on the productivity front as well.

Auckland light rail, a personal pledge

The coalition government was unable to reach agreement on light rail last term. Cabinet suspended progress on the flagship project until after the election. Since then, Wood has taken over the portfolio from Phil Twyford, and for him, making progress on the project is personal.

One of Wood's key promises when campaigning in the Mount Roskill by-election in 2016 was to fast-track a light rail system from Auckland's Wynyard Quarter to his electorate in Mount Roskill.

The project will connect the two largest employment hubs in Auckland — the central city and the area north of the airport — along with the Government's largest housing development in Mount Roskill and Māngere.

"As much as anything it is about connecting up the network," says Wood. "It is not just people using that line, but from it they will be able to access the western line, the northern busway, the southern line, the airport, out to Botany — and you're adding greater additional capacity to the whole public transport network in Auckland."

He is now getting up to speed with the detail of the two options put forward during the competitive bid process by Waka Kotahi NZ Transport Agency and NZ Infra (a consortium that includes the NZ Super Fund and CDPQ Infra, a Quebec-based pension fund). "There are questions that come up — methodology, the route, financing, ownership structures — and we need to work very carefully through those," he says.

But Wood says the project will go ahead on his watch. The next milestone for the project will be a report from the Ministry of Transport, which was tasked by the previous Cabinet to do further work and consider the best option for the project.

"We want to get the decision right at this point," he says. "As Auckland continues to grow, if we don't make these kinds of investments we are going to choke on our own growth."

Open-minded but cautious

As the new Minister, Wood is coming up to speed with several issues in the portfolio, including congestion charging and his level of appetite for public-private partnerships to fund and build transport infrastructure.

On congestion charging, Wood says he will soon receive a report from the Ministry of Transport with analysis into the impacts of various congestion pricing scheme options, and their technical requirements. He says he wants to see what the analysis shows, describing his position as "open-minded, but tinged with a bit of caution as well."

"We haven't got any international comparators with a fully integrated road pricing system that some people are proposing," he says. "I'd be a little bit cautious about leaping into that although I am open-minded to the fact that it could be a useful tool for demand management and managing congestion."

He says there is a sequence in question before Auckland could go down a congestion charging track, which would ensure that are effective public transport alternatives in place before imposing charges on people for using private vehicles.

It raises an equity issue — Wood says that while congestion charging wouldn't necessarily change the way he moves around the city, for those on low incomes it would.

"I would want to see some good analysis and thinking around it before I'd be prepared to take it further," he says.

Wood says he is also open-minded about the use of public-private partnerships to fund transport projects, but wants to take care to make sure the arrangement is right for New Zealand's interests.

> There are a mix of transport priorities — yes, roading, but also public transport, rail, walking, cycling, coastal shipping as well.
>
> Michael Wood

"I have a responsibility to look after the Crown's position and make sure that any arrangements we enter into are done responsibly, that the long-term value is right and that the risk allocation is right," he says.

Construction staff

Wood says while there are calls to keep adding to the transport pipeline, it will be important to ensure New Zealand has the workforce to deliver. An underdeveloped workforce strategy has been a long-term problem for New Zealand, particularly in the infrastructure sector.

"In the long-term, we have a vision to build up a largely domestic workforce that is capable of doing that work and capable of sustaining it over a long period of time," he says, pointing to the Government's free trade training and apprenticeship scheme that was put in place is part of the Covid-response as one way this is being encouraged.

"A lot of work done in the previous term was done by a group of ministers to get the construction sector to work more collaboratively on skills and training along with procurement and all the other range of issues. It's a work in progress there."

Wood says that at this point there will still be a requirement for the workforce to be supplemented with offshore labour as well — particularly in specialist areas.

Eye to the future

Over this term, Wood says he expects to deliver on the manifesto that Labour was elected to implement.

"That will include rolling out those investments that are already in place, but not yet delivered. The big programme that's in the Government Policy Statement on Land Transport (GPS), the shovel ready projects and New Zealand upgrade projects, light rail."

He says the Government is very committed to carrying forward its balanced approach to transport — "there are a mix of transport priorities — yes, roading, but also public transport, rail, walking, cycling, coastal shipping as well," he says.

"We want to get the right solution to the particular transport problems we face in different areas and be mode neutral — starting out with what are we trying to achieve and then considering what mode and what investment is going help to get us there."

Wood says the Government is very conscious that if it doesn't keep up the core investment in maintenance on the state highway network and regional roads they will degrade very quickly.

"There is a big spend that is going on there as well — not necessarily building new roads, but making sure that they are maintained well and that there are constant improvements in terms of the safety profile of them as well," he says.

He says another big aspect of his role will include the agenda around decarbonisation.

"Next year we get the first carbon budget from the climate commission — and transport is about 20 per cent of it."

One thing that Wood makes clear: the next three years won't be about reformulating plans and new strategies — it will be about delivery.

"After a lot of planning, the fruits of that are going to start to be seen," he says.

— Additional reporting Fran O'Sullivan

Projects need to show long-term benefits

Andrew Bayly

● ***Andrew Bayly is National's shadow Treasurer and Infrastructure spokesman***

It is clear New Zealand has an infrastructure deficit. This is at both a central and local government level.

In a post-Covid period, investment in infrastructure can play an essential role in helping to drive economic activity.

Future investment needs to encompass both "hard" infrastructure (roads, rail, houses, water and wastewater) and "soft" infrastructure (education, health, community facilities, etc.). It is also particularly important that this investment be spread across our regions.

The effects of climate change on future infrastructure could be severe. NIWA estimates 125,000 buildings and their associated infrastructure will be affected with a sea level rise of up to 1 metre, and their replacement cost is about $38 billion.

The continuing improvement of our water quality and the resilience of our catchments and waterways is a core value of most Kiwis. Given the scale of investment required by councils, particularly in water and wastewater services, the Government has a role to play in co-investing to address these issues.

However, we have limited capacity in this country to undertake multiple projects at once. This constraint means central government should be clear about its plans and ensure a continuous pipeline of works exists so major contractors can resource accordingly. It also implies local government must be in the mix, undertaking infrastructure projects at a regional level using local contractors. The Infrastructure Commission will go some way to achieving this.

The other issue is the time it takes to get projects underway. All parties agree that the Resource Management Act needs reform and this must be a priority.

Given the significant debt on the Government's books, it is important that future infrastructure projects deliver discernible benefits. So-called "shovel-ready" projects should not necessarily be pursued just because they can occur quickly. Future projects will need to be assessed as to whether they facilitate growth in the economy (e.g. continued rollout of broadband fibre); employ a significant number of New Zealanders, especially in the regions; and act as a catalyst for other development projects.

However, my bigger concern is our procurement processes and our lack of ability to execute well.

We procure poorly in New Zealand. We are too focused on short-term costs and do not adequately assess whole-of-life costs. This means that many of our local suppliers and manufacturers are disadvantaged when a lowball bid is made when in fact it should be discounted due to higher maintenance costs over the life of the project.

In terms of funding and financing, we are open to many of the options that include direct pricing (tolls and user charges) as well as value creation and capture, usually through land development associated with infrastructure investment.

We also believe the Government should be considering the issue of green/infrastructure bonds. There is a strong argument for the Government to lock in funding now, given low current bond/Treasury stock interest rates, and undertake a significant infrastructure building programme.

Infrastructure

Planning needs an overhaul

NZ needs a new strategy to achieve the things we know we all want, writes **Hamish Glenn**

Climate change, inequality, productivity. Covid has accelerated the need to get on top of our biggest challenges and the Ardern Government has the mandate to get on with it.

The first thing we need to see is a list of the big national outcomes this Government wants to promote.

It is hard to believe that there is nowhere that anyone can go to find a list of strategic objectives the Government wants to achieve.

Is merely addressing child poverty a priority, or solving it?

And is it more or less important than higher taxes or debt?

After we write down all the key things we want to achieve — the "outcomes" — the Government can formulate an approach to get there.

This is the strategy. It is the bit between the vision and the plan and is another area where New Zealand is struggling.

For over 30 years, our basic approach to achieve (non-specified) outcomes has been for the Government to hold down costs, spending and, theoretically at least, regulation, allowing individuals and businesses to strike their own path.

It has substantially achieved a fiscal outcome — New Zealand had one of the most enviable fiscal positions pre-Covid — and to varying degrees has given New Zealanders freedom to make their own decisions.

But it has failed in almost every other category. New Zealand remains poorer, more unequal and with faster declining environmental performance than most other developed nations.

Outcomes for some groups, including Māori, are unacceptable.

So we need a new strategy. How are we going to achieve the things we know we all want (once we work out what they are)?

The most obvious way, and the one used by other small countries we can compare ourselves to, is to plan.

Planning is a fiendishly ambiguous term, but what it refers to here is understanding what the physical requirements are to achieve priorities and coming up with an approach to deliver them.

If ensuring everyone has a warm, dry home is a priority outcome, then how many homes do we need, where do we think they are needed, what sort of homes might they be and what other services like water and roads are needed to build them?

> What really needs to happen is for old-fashioned planning to be separated into its own Act, the same way it is in most countries.

Planning will not capture everything. Most educational and health outcomes, for example, are less dependent on the physical environment than on intangibles like teaching and care.

But we can be equally sure that we will not achieve education and health outcomes without schools and hospitals as we are sure that schools and hospitals are not the only factor.

Planning is about giving New Zealand the physical platform for all economic, social, cultural and environmental wellbeing to be promoted.

Unfortunately, we cannot effectively plan in New Zealand.

The Resource Management Act (RMA) impedes long term planning by focusing on the immediate effects of development rather than the long term outcomes and is disaggregated from the funding needed to deliver infrastructure.

In its effort to stop overly-zealous national development planning from bankrupting the country and dictating private decisions, the RMA has decimated our ability to integrate public services, co-ordinate investment and achieve positive outcomes.

Ironically, and contrary to every intent of the Act, it has become a straitjacket for private development decisions and is now dictating what sort of homes people should have, where, and what they can do with their land.

The RMA will likely be replaced in this Government term, but it is not clear that planning can become an effective tool to promote public policy.

Recommendations from the recent resource management review panel include retaining planning as an environmental regulatory tool and separating strategic planning into its own Act.

Spatial plans agreed between central and local government would under this approach smash head on into a revised "RMA" with no certainty that national and regional priorities would prevail. We could just move into RMA 2.0.

What really needs to happen is for old-fashioned planning to be separated into its own Act, the same way it is in most countries.

That way, New Zealand can use planning the way it was meant to be used — to promote economic, social, cultural and environmental public policy objectives.

- The Government could lead the planning system with a set of prioritised national strategic outcomes. These would inform a long term spatial strategy to understand where growth is anticipated and what public services would be needed to meet both it and the outcomes.
- The Infrastructure Commission could develop its national infrastructure strategy to meet this challenge and regions could perform detailed planning and delivery.
- Environmental protection would get its own Act and bottom lines would protect both our natural and built environments from activities which harm our people and environment.

This is a much more coherent approach to achieving the things we all want to achieve. But to achieve it we have to leave the past behind us.

Our planning system needs a complete overhaul, not just from the perspective of resource management, but from the perspective of achieving individual, local and national policy priorities.

That is, after all, what we expect from our governing bodies.

● *Hamish Glenn is Policy Director at Infrastructure New Zealand.*

Infrastructure

Climate change: it's complicated

An OECD report says climate change can increase the cost of supplying infrastructure, reports **Bill Bennett**

Climate change poses a threat to infrastructure. Weather that is increasingly severe, extreme heat and rising sea levels are the most obvious direct threats.

At the same time, we lack a precise knowledge of how future climate change might evolve. That makes long-term planning difficult.

There are many uncertainties. The OECD's climate resilient infrastructure report says global averages and changes to measures such as average temperature or rainfall point to the scale of the threat.

Yet how climate change affects a particular asset, say a road or a reservoir, is uncertain and context specific.

While we have some understanding of the big picture changes, the report warns: "Key aspects of the climate system that affect regional and local projections are not yet sufficiently well understood and modelled."

To complicate matters, the report warns that the various global trends can interact with each other and with local conditions to cause even more extreme impacts. And on top of this there are risks from events cascading through infrastructure networks.

Another area of concern is that climate change can increase the cost of supplying infrastructure.

If, say, the asset is a reservoir, it will need to be larger to address greater variation in the amount of rain captured.

The report says these impacts will be particularly important for cities, as they rely upon extensive infrastructure networks for access to water, energy and food.

Water levels are still low at the Mangatangi Dam in the Hunua Ranges. Photo / Alex Robertson

Governments, authorities and planners can minimise the risks and uncertainty by developing climate resilient infrastructure.

Done well this can cut the frequency and severity of disruption while reducing the need to invest in back-ups.

By preparing for climate change from the outset, infrastructure owners can increase the life of their asset while reducing repair and maintenance costs.

The various global trends can interact with each other and with local conditions to cause even more extreme impacts. And on top of this there are risks from events cascading through infrastructure networks.

It will take longer for climate change to render the infrastructure obsolete.

An alternative approach is adaptive management.

A hydroelectric dam might have a design life of 70 to 100 years. There's a wide variety of possible climate outcomes over that time. Preparing for all possibilities is prohibitively expensive; building in flexibility from the start so that adjustments can be made over time will increase the dam's lifespan.

Impacts of climate changes in different sectors

	Temperature changes	Sea-level rise	Changing patterns of precipitation	Changing patterns of storms
Transport	– Melting road surfaces and buckling railway lines – Damage to roads due to melting of seasonal ground frost or permafrost – Changing demand for ports as sea routes open due to melting of arctic ice	– Inundation of coastal infrastructure, such as ports, roads or railways	– Disruption of transport due to flooding – Changing water levels disrupt transport on inland waterways	– Damage to assets, such as bridges – Disruption to ports and airports
Energy	– Reduced efficiency of solar panels – Reduced output from thermal plants due to limits on cooling water temperatures – Increased demand for cooling	– Inundation of coastal infrastructure, such as generation, transmission and distribution	– Reduced output from hydropower generation – Disruption of energy supply due to flooding – Insufficient cooling water	– Damage to assets - e.g. wind farms, distribution networks – Economic losses due to power outages
Telecoms	– Increased cooling required for datacenters	– Inundation of coastal infrastructure, such as telephone exchanges	– Flooding of infrastructure – Damage to infrastructure from subsidence	– Damage to above ground transmission infrastructure, such as radio masts
Urban development	– Increased cooling demand – Reduced heating demand	– Inundation and increased flood risk – Changes in land use due to relocation of people living in exposed areas	– Risk of drought – Flooding	– Damage to buildings – Deaths and injuries
Water	– Increased need for treatment – Increased evaporation from reservoirs	– Inundation of coastal infrastructure – Salinisation of water supplies – Decreased standard of protection offered by coastal defences	– Increased need for water storage capacity – Increased risk of river embankments being overtopped	– Damage to assets – Decreased standard of protection offered by flood defences

Source: OECD Climate Resilient Infrastructure report

Infrastructure

Andrew Bashford

'When we're talking about infrastructure, it's not just about building and designing new stuff.

Clearly, it's modifying what we've already got, but actually, probably more importantly, it's about how can you use infrastructure to support decarbonisation and mitigate risk.

How do you influence the infrastructure strategy, so you actually change consumer demand.

Talking about electrification and the use of electric vehicles, and having fast-charging stations throughout the whole country - if you took that approach, that could actually have a massive change in terms of people buying cars, the types of cars and the way they use them.

I think a lot of the thinking needs to involve basically climate change scientists.

So, what I haven't seen in a lot of documents that have been published is the science around it.

And then what that means, both for opportunities and challenges for infrastructure.

You probably need to bring a team together with those subject matter experts to help develop that coherent connected strategy for the next 20-30 years.'

● *Andrew Bashford is Head of Institutional Relationships, Institutional & Business Banking at Westpac NZ.*

Joanna Silver

'From a climate policy perspective the new Government's only a few weeks old. And it was very clear last term, that was the term to set up frameworks, institutions and architecture to help with cutting emissions: the Zero Carbon Bill, Climate Change Commission, Green Investment Fund, and also mandating climate risk reporting.

We haven't actually cut emissions yet, in fact, we're on track to increase them.

So this is the term to actually reduce emissions. When the Climate Change Commission's draft budgets come out in February and then get implemented by Government, that's going to set up the policy environment for business to respond.

I would expect that soon we will see a strategy from Government around infrastructure. A 2030-2050 strategy that aligns infrastructure to those climate changes and societal priorities.

The UK National Infrastructure commission put out a report a couple of months ago on commission recommendations and the net zero target and did a gap analysis.

It would be great to see the New Zealand Infrastructure Commission replicating that over here.'

● *Joanna Silver is Head of Sustainable Finance, Institutional & Business Bank Westpac NZ.*

Ready for the coming storm

The impact of climate change on infrastructure will be a hot topic for debate at today's Rebuilding Nations symposium. **Fran O'Sullivan** spoke with Westpac's Joanna Silver and Andrew Bashford about their views of the importance of this issue to NZ's infrastructure agenda.

A jogger on Tāmaki Drive is hit by waves from a storm front. Photo / Brett Phibbs

Herald: Climate risk has now become mainstream — it's not simply a conversation anymore but a real-world problem that is forcing business adaptation. How should we think about the impact for NZ infrastructure?

Joanna Silver: We've certainly learned this year that if you listen to science there are good outcomes. And we've seen in other jurisdictions where if you don't listen to science, you don't have great outcomes.

A lot of people don't realise this isn't just about sea level rise. If you look at the National Climate Change Risk Assessment that came out in August, it outlined priority risks by urgency.

When you look at that risk assessment, you ask several questions — do we have water we can actually drink? Can we manage our waste and stormwater impacts and can we withstand the economic costs associated with this? Can our agri sector still produce under these circumstances? Can our buildings withstand these climatic events? Water infrastructure, health, landfills, fisheries, forests, the financial system, insurability of assets, the Treaty, mental health, coastal ecosystems, transport networks, supply chains, ports, airports — so it goes on.

There is a need for a changed mindset.

Herald: What is the role of businesses in not only adjusting to the transition but also leading change towards a new mindset?

Andrew Bashford: Clearly the economy is dependent on businesses. There is increasing awareness around the responsibilities businesses have to a wide stakeholder group. There's been a massive mindset change away from short-term capitalism — the American approach — to a much longer-term view.

That's supported by all sorts of things — even discount rates; the WellBeing Budget and Living Standards Framework — just the level of social consciousness that exists in New Zealand.

Herald: Getting on to decarbonisation. There has been plenty of talk about EVs and how we could reduce pressure on agriculture if we reduced transport emissions. Is there a real impetus behind that?

Bashford: There have been some early adopters, but I do feel momentum is building.

This is one of the biggest opportunities we've got. If you look at Government policy and the fact that they've committed $100 million to a shovel-ready project looking at dry storage solutions and electrification, it highlights Government is focused on it.

We are seeing more and more corporates interested in this area. I'm not just talking about residential vehicles. Large transport users are starting to consider different technologies like hydrogen. Truck transport is actually a really, really interesting area. But it's very early days.

Silver: Rather than focusing on 100 per cent renewable electricity, perhaps we should focus on accelerating electrification of two core sectors — transport, and the process sector, which is 20 per cent and eight per cent of the carbon footprint for the country respectively. We really need to use electricity and increase electricity to enable the decarbonisation of our high carbon energy sectors, particularly ensuring inclusion of transport and processing.

Bashford: We basically need a new approach, and we don't want to waste this opportunity, which is very much focused on great progress already achieved with respect to defining those natural capitals, or you know, the wellbeing outcomes that we're after. And coming up with an integrated strategy, vision and policies, which delivers it.

I guess our message is that we think New Zealand basically needs to lift its game in this respect.

> We've certainly learned this year that if you listen to science there are good outcomes. And we've seen in other jurisdictions where you don't listen to science, you don't have great outcomes
>
> Joanna Silver

Herald: Joanna, you're speaking at Rebuilding Nations, what is the message you want to get across?

Silver: I've got three key points that I want to bring out. The first is the need for an intergenerational long-term, strategic investment prioritisation.

Second, Westpac New Zealand's climate disclosure work that we've been doing.

And then the third piece is how we finance our way through this transition.

And the way that we talk about it with our customers is, at a macro level, around how environmental and societal risks are changing and fast. Importantly, there are real-world legal economic implications for those businesses who don't manage climate risks and start the transition.

Then you have the increasing social challenges from Covid and the new operating environment within which we need to design this infrastructure plan. A lot of sources of capital are going to be needed to respond to that environment.

And then in terms of how that plays out locally, we are starting to see an increasing amount of sustainability strategies and corporate strategies aligning.

Herald: Where does this leave companies and investors?

Silver: The huge flow of international capital coming into New Zealand issuers because of what they are committed to is potentially going to squeeze out domestic institutional investors that don't have the same strength of ESG mandates that perhaps some of those institutions have.

Sustainable finance structures and market standards are evolving and developing to meet the needs of more issuers and borrowers, we've seen a lot more sustainability linked structures coming onto the market, both loans and bonds.

Global markets are increasingly embracing sustainable finance and New Zealand is following. There's been a lot of issuance this year, and the New Zealand issuers on the market are all aligned to international sustainable finance principles.

So there's all these different dynamics that are coming together to really shift the dialogue and increase engagement from business.

Herald: Andrew, Westpac has taken a leading role on sustainability. Can you spell out what the bank is prioritising to help its customers adjust to this new business environment where climate change is forcing adjustments across the board?

Bashford: There are probably three factors. One is essentially helping business customers with solutions and tools and how they can basically more effectively manage. It's actually quite exciting. At a consumer level we're doing winter warm-up loans, for instance.

And we are investing by lending directly or facilitating the arrangement of funding for investment and resilient infrastructure.

We are providing thought leadership and will be reporting in accordance with the TCFD framework and making some quite ambitious commitments around our sustainability targets.

We believe we are in a crisis — we can accelerate the recovery and build really strong long-term outcomes in respect of environmental, social and economic, by delivering and designing climate-resilient infrastructure that mitigates climate risk.

Infrastructure

Vaccine for our ailing economy?

The decisions we make today will deliver prosperity for generations to come, writes **Stuart McKinnon**

On March 25th — when New Zealand first went into level 4 lockdown — Covid-19 was about to test our broadband infrastructure like nothing had ever tested it before.

As our cities and towns emptied out, the internet filled up.

The only safe way of interacting with the world outside our bubbles was online and millions of Kiwis switched to working, learning, running businesses, shopping and communicating online.

ANZ is a really good example.

Banking is an essential service and we had to do our bit to keep the economy going providing secure, reliable services for our customers.

It was crucial our staff were able to do that safely, and in the space of a few days we had more than 5000 of them set up to work from home.

Apart from a handful of branches operating on reduced hours and some essential staff in our corporate sites, we pretty much ran our entire New Zealand business from homes around the country.

This highlights just how important reliable broadband is.

We could only get the job done because as a nation we began investing in New Zealand's telecommunications sector decades ago.

It's a real challenge to look beyond Covid-19 and ensure the decisions we make today not only benefit us, but also generations to come.

But if we get this right, infrastructure could be the vaccine our Covid-19 ailing economy desperately needs right now — while also future-proofing us against further shocks.

While we can't transport ourselves into the future to see the ultimate outcome of our decisions, we can look to the past for help. And our telecommunications sector is a great example.

We've always viewed our investment in broadband infrastructure and connectivity as an essential part of bringing us closer to the rest of world.

As a small trading nation so far from global markets that long-term thinking has been critical.

Collectively it has meant we've remained focused on the end goal, not the project.

Previous investments and interventions by both National and Labour Governments have proved incredibly valuable, as have been the smart private sector investment supporting them.

It was only a couple of decades ago that one company owned all the phone lines and there were only two mobile networks here in New Zealand.

In 2006, Labour made changes and introduced competition by allowing other telcos to sell products and services using Telecom's New Zealand network.

Then in 2008, National announced it would invest $1.5 billion to roll out the Ultra-Fast Broadband network.

We now have a mature and competitive telecommunications market with three network operators and a nationwide broadband network.

Our connection to the internet, and the rest of the world, is via 35,000km of fibre optic cables on the ocean floor running between New Zealand, the Pacific, Australia and the US.

This cable network ensures we have good quality, secure, dependable and cost-effective connectivity.

Without it, our telecommunications landscape wouldn't have been able to develop as it has.

The Southern Cross Next project under way now will expand our capacity and connectivity even further. A significant two-year build spanning multiple jurisdictions, the Southern Cross Next project will also connect parts of the Pacific with high speed internet for the first time, opening up numerous benefits and opportunities.

The Southern Cross Next project: The survey vessel ESG Resolution off the coast of Tokelau; building work in Tokelau; some of the optical equipment and interior of one of the cable stations.

> Connectivity can help us turn the barrier of geographical distance into an opportunity.
>
> Stuart McKinnon

This is a critical factor in future-proofing our connection to the world.

Submarine cables like this are very expensive and costly infrastructure builds requiring a significant amount of capital up front with returns over a long period.

Without the availability of private sector investment, projects like this are unlikely to go ahead and ANZ is proud to have supported this project through our partnership with Southern Cross.

As we look to recover and re-build in the wake of Covid-19, New Zealand's telecommunications sector is an example of long-term vision and investment paying off.

Our connectivity can help us turn the barrier of geographical distance into an opportunity.

So what can we learn from this?

Covid-19 has changed everything. The politics of debt and the previous debt to GDP target of 20 per cent have changed and there is now broad consensus for Government spending.

Over the past three years the Government has largely focussed on setting the framework and groundwork for how they will deliver infrastructure.

They've committed $12b to replace critical infrastructure throughout the country in rail, road, housing, schools and hospitals.

On top of this another $3b of spending was announced in July from the Covid Response and Recovery Fund.

We now have an Infrastructure Commission developing a 30-year plan and we're repealing and replacing the Resource Management Act. All this, alongside a renewed focus and urgency to get "shovel-ready" projects under way to create jobs and drive economic growth, is great to see.

The private sector can also play an important role here, and at ANZ we are keen to play our part.

We've been a market leader in developing the infrastructure finance market in New Zealand and are keen to support the rebuild of sustainable infrastructure in the coming years.

There is a real opportunity, particularly in areas like our water infrastructure, for the private sector to provide both capital and expertise.

New Zealand has arguably the best basic water supply in the world.

However, underinvestment in our drinking water, sewerage and waste water infrastructure has put parts of the country close to crisis point already. It is estimated $3-4b of investment is required to bring our water services up to international standards.

Our decisions about how we fund and commission these critical long-term assets will have consequences for the wellbeing of New Zealanders well into the future.

Working together with strategic vision, innovation and discipline the decisions we make today will deliver long term prosperity for generations to come.

We've seen how successful this has been in our telecommunications sector. We should take the positives from this model and apply them to how we build for the future in other areas of infrastructure too.

Infrastructure: could it be the vaccine for our Covid-19 ailing economy?

● *Stuart McKinnon is Managing Director, Institutional, ANZ NZ.*

Infrastructure

On the fast track to consent

David Parker on ways to accelerate infrastructure projects and job creation

We are committed to reforming the resource management system this parliamentary term. This is a once-in-a-generation chance to set the system up for the next 20 to 30 years.

We live in uncertain times. Covid-19 has cast a considerable shadow over our everyday lives, our economy and the wellbeing of our people. The Government has responded quickly to lessen the social and economic disruption the pandemic has wrought here in New Zealand, and to lay foundations for a faster and stronger economic recovery while protecting the health of New Zealanders.

We have set out an extensive programme of new infrastructure investment, which will provide certainty to the regions and employers and deliver significant economic benefits. We are investing in projects that are ready to go, and also building a long-term pipeline of investment to boost confidence and certainty.

Accelerating infrastructure projects

Mid-year I took through Parliament the Covid-19 Recovery (Fast-track Consenting) Act to help support the economic recovery by accelerating the consenting process for eligible projects to deliver jobs sooner and support economic recovery, as well as helping address New Zealand's infrastructure deficit.

The new Act is a short-term response to an extraordinary situation and will self-repeal in July 2023. It does not replace or circumvent the current Resource Management Act 1991 (RMA), but it provides alternative pathways for speeding up decisions on resource consents and designations while ensuring that environmental safeguards and Treaty of Waitangi and Treaty settlement obligations are maintained.

There are three pathways to accessing the fast-track process. The first comprises 17 projects named in the Act. They can by law directly apply to an expert consenting panel for consideration.

The new Matawaii water storage reservoir in Northland was the initial project approved by an expert consenting panel led by former Chief Environment Court Judge, Laurie Newhook in October. This decision was made in 55 days from the time the application was lodged. This is around half the time a similar consent would have taken under the RMA, assuming there was no appeal.

The reservoir will provide drinking water for Kaikohe and support Northland's horticulture and agriculture sectors. Its construction will create much-needed jobs in the region, and the increased supply of water will have also attract and retain large- and small-scale investment that will further improve job prospects and social wellbeing.

A second pathway under the fast-track law allows anyone to apply to me as the Minister for the Environment for their project to be referred to an expert consenting panel.

Not every project is accepted. When making my decision whether to refer or not I must consider whether the project meets the purpose of the Act in terms of promoting employment, supporting ongoing investment certainty, and promoting the sustainable management of natural and physical resources. Factors I look at include public benefits such as increased housing supply, well-functioning urban environments, improved coastal or freshwater quality, and reduced greenhouse gas emissions. I also consider whether it is a rehash of a prior rejected application or whether greater public participation is desirable.

I have already referred four extra projects including one relating to Transpower's Clutha Upper Waitaki Lines Project. This will provide accommodation for the people working to increase the capacity of the electricity network to boost New Zealand's drive to be 100 per cent renewable in electricity and improve the resilience of the national electricity grid.

Central Otago is one of the areas hardest hit by the downturn in international tourism caused by Covid-19, and speeding up projects like this will help create jobs while providing a much needed improvement to an important part of New Zealand's infrastructure.

The third pathway under the fast track law enables some work to be carried out without the need for a resource consent, such as specific works by KiwiRail and the New Zealand Transport Agency on their existing infrastructure.

A new era in resource management

While the fast-track consenting process is an immediate response to help us rebuild and recover from the impacts of Covid, our vision for the environmental management system is much more far-reaching.

We are committed to reforming the resource management system this parliamentary term. This is a once-in-a-generation chance to set the system up for the next 20 to 30 years. It provides the opportunity to enhance the wellbeing of generations to come by clearly setting the outcomes we need to achieve for the natural environment and for urban development and housing. It will also help us respond effectively to climate change.

The reform will be based on the comprehensive review of the resource management system by the Resource Management Review Panel, led by Hon Tony Randerson QC. This was the most significant, broad-ranging and inclusive review since the RMA was enacted.

After engaging widely on an issues and options paper, the panel delivered a package of sweeping recommendations intended to transform the system. Key is the replacement of the existing RMA with two separate pieces of legislation – a Natural and Built Environments Act and a Strategic Planning Act – along with a separate law to address issues related to climate change adaptation and the managed retreat from areas threatened with inundation.

An important part of the reforms is to ensure that infrastructure and land use planning decisions are aligned.

The panel recommended greater use of national direction by the Environment Minister, a more streamlined process for council plan-making, a vastly reduced number of plans, and a more efficient resource consent process. It also proposed that the future system should give effect to the principles of Te Tiriti and provide a clearer role for mana whenua in decision-making.

I expect to make substantial progress on the new legislation, based on their report, by the middle of 2021.

As we build back better and accelerate our recovery from Covid-19, we are enhancing New Zealand as a place to live, now and for future generations. The way we manage our resources, improve our infrastructure, and protect the environment is fundamental to this.

● *David Parker is the Minister for the Environment.*

Infrastructure

Agile, flexible CRL tackles

'Voyage into uncertainty' delivers an outstanding outcome writes **Sean Sweeney**

"Bloody amazing!" – these two words perfectly sum up the progress the City Rail Link (CRL) project is making as we deliver Auckland's first underground railway and transform the travel options for the people living here.

At the start of the year as chief executive I was talking about the project starting a massive voyage into uncertainty and engineering complexity – I was referring then to a new phase of construction challenges ahead for CRL and long before I or anyone else was aware of a virus called Covid-19 and the impact it would have on the project and the wider infrastructure industry.

No one had planned for a pandemic in their construction "rule book" and CRL's went out the window immediately with Covid's arrival – I was on a plane flying south for a break when I first heard news of the lockdown that would close all our construction sites for 28 days and the repercussions that would have on productivity.

In many ways, CRL had to start from scratch redesigning the way we would deliver New Zealand's largest ever transport infrastructure project in a Covid world after the lockdown. Our Risk Register now, for example, looks nothing like the one we had before the pandemic.

Nevertheless, the pandemic continues to impact on the programme. Production can't be stopped for 28 days (as it was during the level 4 lockdown) without an impact on project costs and timetables. The full impacts won't be known for some time. I don't want to make predictions every time a lap of the CRL race is run, but it is fair to say our Crown and Auckland Council sponsors are aware the project has suffered far less cost and delay to date than other big transport infrastructure projects.

I believe we came out of the starting blocks quicker than most after the lockdown – productivity was quickly back to pre-lockdown levels. The Alliance model we had adopted to deliver our main stations and tunnels contract helped. It allowed us an agile and flexible response to Covid – significantly, throughout the lockdown 800 people continued to work from home on designs, consent applications and reconfiguring work programmes.

Again, this highlights the value of the alliance model for delivery. After lockdown, the Link Alliance immediately introduced longer working hours at its sites to regain construction momentum. It's been nimble – an example of this has been the redeployment of existing machines and workers to do jobs that had been assigned to highly specialised overseas machinery operated by skilled international workers unable to get here.

The revamped lower end of Albert Street; mining the access tunnel at Karangahape Station – preliminary work prior to start of mining station platforms; the Mercury Lane access shaft at Karangahape Station.

It hasn't been ideal, but we have managed to keep the project progressing. And CRL sites made a seamless transition when Auckland returned to the Stage Level 3 last August, incorporating lessons learned from the earlier lockdown to maintain production and keep our workers safe.

One of the biggest challenges involves those skilled workers from overseas. The successful bid last year from the Link Alliance for CRL's mains tunnel and stations contract identified the need to get approximately 200 international workers and families into the country because of skills and experience not available locally.

It's not a challenge with easy solutions. There are issues finding a seat on a plane coming to New Zealand – one skilled worker tried seven times to get here from Paris – and there are issues getting across the border when they do arrive. A third challenge involves those international workers already here and their needs to return to their homes and loved ones. CRL has been working with the wider infrastructure industry on a proposal for Government and its advisers to consider where the industry manages self-isolation facilities for international workers.

Covid continues to cast a long shadow in other ways. CRL's Risk Register has been modified to now include risk assessments relating specifically to the virus. Our register now includes five Covid-related risk assessments – issues like the consequences of any future lockdown or a Covid outbreak in a CRL office or construction site.

The Covid environment we now work in also means CRL has more expertise in scenario planning to mitigate impacts from the virus.

When I talk of "bloody amazing" I do so with a great sense of pride. Despite the pandemic, work continues apace across all CRL sites.

One of our most important "employees" arrived from China month. The 130-metre-long Tunnel Boring Machine (TBM) named after the inspirational Māori activist, Dame Whina Cooper, is now being reassembled by the Link Alliance at the Mt Eden site. The TBM is custom-made for Auckland soil conditions and will start mining its way into the central city next April. Mining the first 50 metres of tunnel at Mt Eden to accommodate Dame Whina Cooper into the portal is under way.

Mining has also started for New Zealand's deepest railway station. The platforms for the Karangahape Station under Karangahape Rd are 35m below ground. Link Alliance innovation includes a huge soundproofed enclosure half the size of a rugby field built over the access shaft to reduce construction noise for those living and working in the area.

CRL has a strong commitment to preserving the past and at Aotea Station in the central city one of our most important pieces of preservation work is under way – the

CRL legacy initiative targets youth, jobs

From the outset the City Rail Link project has been committed to the delivery of an exemplar project – our scale, complexity and innovation will set the benchmark higher not just with construction but in the wider community too.

Leaving a positive and lasting social legacy includes a 19-week-long job-creating initiative known as the Progressive Employment Programme (PEP) – targeted training and job opportunities for Māori and Pasifika, and youth in general (rangatahi).

City Rail Link Ltd introduced its PEP initiative with a simple bottom line: to help unblock the path that might be preventing the youngsters from getting to the employment starting line.

I believe big companies have an equally big responsibility to make a difference, even a small one, where they can help those who find their way to a job blocked. That's a view reinforced by the Covid world we now have to deal with.

Progressive Employment Programme graduate Henare Thompson working as CRL junior Health and Safety Advisor.

CRL Ltd's pilot included six rangatahi – two young women and four young men. The six were still at college or had just left and were chosen by external organisations which actively supported the PEP pilot and provided pastoral care for rangatahi.

Rangatahi undertook meaningful work and were paid the living wage during the pilot. Work and training was supported on site by CRL job buddies and mentors

This multi-faceted approach ensured rangatahi got maximum benefit from the programme, were cared for, had a positive experience working at CRL, and gained the experience and skills needed to give them a head start to their careers.

Rangatahi initially spent 10 hours a week on the job which later increased to 20, and then 30 hours. They were exposed to a wide range of work that forms the grist of the infrastructure industry – IT, administration, sustainability, carpentry, spotter, health and safety and traffic control.

The youngsters received formal training specific to the roles they had chosen to focus on – practical skills like working at heights or working in confined spaces, while others chose sustainability or safety training.

The PEP was also about learning to be work fit – balancing life at work with life at home, money management, getting used to being on time, and being tidy and polite.

Following our pilot, five of the six rangatahi were offered full-time employment on the CRL project or with companies linked to the project.

Feedback from an external audit of the pilot described it as "highly effective" Even more satisfying was the feedback from rangatahi themselves. Training was "useful, relevant and positive", and they reported a common experience of increasing skill levels and developing new goals. Those included getting a car, providing support for whanau, and, importantly for the wider industry, supporting others into construction and infrastructure employment.

We're now waiting for the judges' decision later this month to see if our PEP initiative wins NZ's Building Nations award for Excellence in Social Impact.

In the meantime, CRL Ltd has passed its PEP baton to the Link Alliance – six New Zealand and international infrastructure-based companies, together with CRL Ltd – that is delivering the project's substantive stations and tunnels contract. Some changes have been made to our pilot to sharpen the training opportunities, but the objective remains unchanged.

Big projects are about leaving a legacy – leaving a place better than they found it. If you take a wider view of that definition, the Progressive Employment Programme is exactly part of that commitment.

Infrastructure

Covid-19's long shadow

temporary removal of one of Auckland's distinctive and historic landmarks. The Bluestone Wall in Albert St near Durham Lane is being removed stone by stone to make room for our tunnel. Each stone is being numbered and will be restored to its original position in the wall, although the wall will be moved one metre further east (towards Queen St) when we've squeezed in the tunnel.

One of the early CRL contracts — lower Queen St/Britomart/CPO — is almost complete. Refurbishment of the Chief Post Office finishes in next March and a fantastic looking new meeting place for Aucklanders in front of the CPO — a square to be known as Te Komititaga (to mix or to merge) — opens next month.

Another early contract — C2 in the lower end of Albert Street — has finished. There is now a great new space in the middle of the city. At street level above the rail tunnel, Albert St has wider pavements, bus bays and new street furniture, lights and native streets — it gives Aucklanders some idea of what CRL will leave behind when we finish all our work.

Further south, at Ōtāhuhu, our work with KiwiRail on track and station improvements to accommodate improved rail services related to CRL has also finished. There is, however, still plenty of CRL work to come.

We will be working with KiwiRail on track and station improvements at the eastern or Parnell end of the Britomart Station.

And we have signed two important contracts with the Link Alliance after the collapse a couple of years back of Australian-based RCR NZ Ltd. One contract — rail infrastructure — involves connecting CRL with the wider rail network at Mt Eden, and the other — rail systems — involves the fit-out of the CRL tunnels. Both will be delivered within the existing $4.4 billion funding envelope for CRL.

There's more to celebrate!

During disruptive Covid we won the computer-based Autodesk Architecture Engineering Construction Excellence Awards 2020 in the Infrastructure Design, Large Projects category. This was for our efforts using Building Information Modelling (BIM) in design. To win this we headed off competition from other international projects in North America and Asia

Our Progressive Employment Programme — aimed at Māori and Pasifika youth — has been selected as a finalists in Infrastructure NZ's Building Nations award for Excellence in Social Impact.

These are two examples of how CRL Ltd provides leadership to the construction industry and leaving a legacy of best practice that will endure after the project is completed.

We haven't shaken off Covid's threat, but CRL is demonstrating its agility and flexibility in the face of sudden adversity to deliver an outstanding project that will not only change Auckland but upskill a workforce to benefit New Zealand for years to come.

Most Rev. Michael Gielen, Auxilliary Bishop of Auckland, blesses St Barbara, patron saint of those working underground, at CRL's Mt Eden site; Still under wraps — sections of the Tunnel Boring Machine awaiting reassembly at Mt Eden after their arrival from China.

Sean Sweeney says the CRL project will not only change Auckland but upskill a workforce to benefit New Zealand for years to come.

Infrastructure

On with the big jobs —

Plenty is happening to discharge a pipeline of road and rail projects, worth $6.8 billion, writes **Graham Skellern**

A group of major infrastructure projects, representing the government's biggest capital investment in 20 years, is getting ready to hit the road running.

The 22 road, rail, cycling and walking projects in the main centres — worth a total of $6.8 billion — are part of the $12b New Zealand Upgrade Programme, announced earlier this year.

Prime Minister Jacinda Ardern then said the programme was "a once in a lifetime opportunity to invest in New Zealand — modernising our infrastructure, preparing for climate change and helping grow the economy."

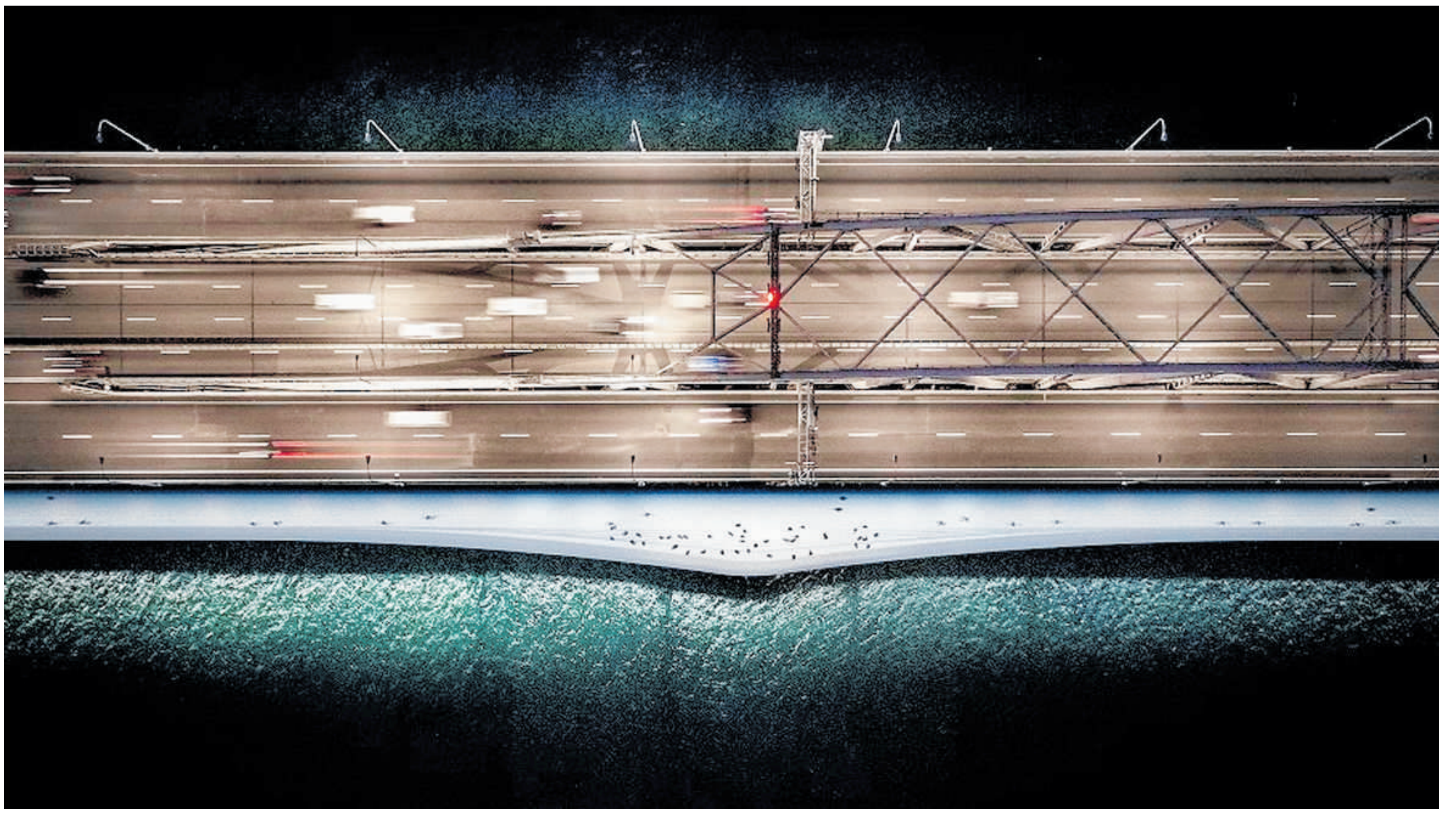
A further $400 million went towards upgrading schools; $300m for health facilities including mental health and addiction and child and maternal, and upgrading hospitals; $300m for smaller regional transport investments; and $200m for decarbonisation projects such as replacing coal boilers at schools and upgrading Christchurch Hillmorton Hospital's mental health unit to a higher Green Star rating.

The new infrastructure investment is forecast to increase the size of the economy by a further $10 billion over five years.

The transport projects are aimed at unlocking housing developments such as Drury, Karaka and Paerata near Auckland's Southern Motorway and clearing some of the country's most dangerous traffic black spots.

A new feature of some of the expressway projects is providing dedicated lanes for public buses, trucks carrying freight and cars containing more than one person.

The upgrade programme meant the NZ Transport Agency had an additional spend of $6.8b, along with its annual budget of $4b, and the agency could bring forward the timing of the selected projects.



The long-awaited SkyPath is expected to start early next year and take more than three years to build.

Auckland — whose population is expected to reach 2 million within 13 years — received a strong dollop of funding, with $2.5b for roads and most of the $1.1b to enhance its rail network.

Further widening of the Southern Motorway with an extra lane in both directions from Papakura to Drury South, a total of 8km, will start early next year and be completed in late 2025. There will be a separate walking and cycling path alongside the northbound lane.

> A new feature of some new expressways is providing dedicated lanes for buses, trucks carrying freight and cars carrying multiple people.

Two rail projects are about to kick off and be completed later in 2024 — electrification of the Auckland Metro line between Papakura and Pukekohe and upgrading Pukekohe station; third line for freight and passenger services from Wiri to Quay Park in downtown Auckland and improving access to Ports of Auckland from Quay Park.

Two new railway stations and bus and rail interchanges will follow at Drury East and West in 2023-24, and the $1.35b Mill Road connection from

Major road and rail projects get ready to start

The New Zealand Upgrade Programme, with a budget of $12 billion, is designed to improve transportation, health and school facilities, and boost productivity in the country's main growth areas. A total of $6.8 billion is being invested in major road, rail, cycling and walking projects. A further $300m went into renewing health facilities, $400m to upgrade schools, and $300m for regional transport investment. A total of $4b was kept back for future budgets and projects.
Here's the timing for the major transport projects in the main centres:

NORTHLAND/AUCKLAND

Roading: State Highway 1 Whangarei to Port Marsden: 22km four-lane corridor with separated walking and cycling path. Construction planned to start late 2023/early 2024 and completed 2027/28. Estimated cost $692 million.
Penlink linking Whangaparaoa Peninsula to Northern Motorway: 7km tolled corridor, reducing congestion in the Silverdale business area. Start late 2021 and completed late 2025. Estimated cost $411m.
New Mill Road connection from Manukau to Drury South: 21.5km four-lane corridor running parallel to Southern Motorway with separated walking and cycling facilities. Start late 2022 and completed from 2025-28. Estimated cost $1.35 billion.
Widening Southern Motorway from Papakura to Drury South (8km): A third lane in each direction and upgrade of Drury interchange, separate walking and cycling path alongside northbound lane. Start early next year and completed late 2025. Estimated cost $423m.
Northern Pathway including SkyPath across Auckland Harbour Bridge and SeaPath from Northcote to Esmonde Road (3km) for cyclists and pedestrians. Start early 2021 and completed 2023/24. Estimated cost $360m.
Auckland rail: Electrification of track between Papakura and Pukekohe including upgrade of Pukekohe station, extending Auckland Metro line by 19km. Start late 2020 and completed mid/late 2024. Estimated cost $371m.
Third line for freight and passenger services from Wiri to Quay Park in downtown Auckland: Ease bottleneck between Wiri and Westfield, provide additional capacity around Westfield Junction, works around Quay Park to improve access to the Ports of Auckland. Start late 2020 and completed mid/late 2024. Estimated cost $315m.
Two new stations and bus and rail interchanges at Drury East and West. Start 2023 and completed late 2024. Estimated cost $247m.
Also, upgrading the Northland rail line from Swanson to Whangarei through $204.5m investment by Provincial Growth Fund – including replacing five bridges, lowering the tracks in 13 tunnels to allow hi-cube shipping containers, and purchasing land along the designated route to NorthPort. Work has started.

WAIKATO/BAY OF PLENTY

State Highway 1 and 29 intersection at Piarere: Improving safety at one of New Zealand's most dangerous intersections by constructing a large roundabout to replace existing T-intersection. Start early 2022 and completed 2024. Estimated cost $58m.
Tauranga Takitimu North Link (formerly called Northern Link): New 14km four-lane corridor between SH29 Takitimu Drive toll road and SH2 Omokoroa intersection, with separate walking and cycling path. Completed in two stages, and request for tender has been issued. Start on Tauranga to Te Puna in late 2021 and completed in 2026. Timing for stage 2 to Omokoroa yet to be finalised. Total estimated cost $933m.

WELLINGTON

State Highway 58 improvements: Work on 3km section between Western Hutt Rd to Mount Cecil Rd began late last year, and second stage between Mt Cecil Rd to Transmission Gully interchange at Pauatahanui is in design and consenting phase. Total estimated cost $100m-$120m.
Lower Hutt Melling interchange: New intersection to improve safety, replacing roadbridge over the Hutt River and improving access to walking, cycling and public transport. It removes a dangerous signal-controlled intersection on SH2. Start late 2022. Estimated cost $258m.
Otaki to north of Levin, the northern most section of the Wellington Northern Corridor: New four-lane highway with separate shared path. Start 2025 and completed 2029. Estimated cost $817m.
Rail package, upgrading tracks for the Wairarapa and Capital Connection lines, safety connections including Pamerston North, and refurbishment of Capital Connection carriages. Estimated cost $211m.

CANTERBURY

Roading package $159m supporting growth south-west of Christchurch and in neighbouring Selwyn District, including:
$60 million, for new two-lane overbridge over SH1 and rail line at Rolleston connecting the residential and industrial areas. Also four intersection upgrades. Start 2022 and completed 2025.
$40 million, for improving SH76 (Brougham St) in Christchurch with priority public transport and walking and cycling access. Start 2022 and completed 2024.
$25 million, for two dedicated bus lanes along Halswell Rd (SH75). Start 2022 and completed 2024.
$34 million, for intersection safety improvements at Tinwald, Ashburton and West Melton.

QUEENSTOWN

Roading package $90m to promote public transport for State Highway 6A corridor into town centre and SH6 Grant Rd to Kawarau Falls, including building bus lanes and new bus hub, upgrading SH6/SH6A intersection and underpass at Ladies Mile for cycling and walking connections. Start late 2021 and completed in stages in 2024.

REGIONAL INVESTMENT

A further $300 million set aside to improve the safety and resilience of the regional transport network, including: $15 million, for SH10/ SH11 roundabout at Puketona Junction in Northland.
$14 million, for improving 8.1km stretch on SH5 between Tarukenga and Ngongotaha near Rotorua, and improve SH36/SH5 roundabout.
$13 million, for improving SH2 (College Rd to Silverstream) north of Waipukurau in Hawke's Bay.
$13.4 million, for improving Forgotten World Highway in Taranaki and enhance the tourist destination.
$5 million, for pull-over areas on SH8, SH79 and SH80 in MacKenzie Basin.

Infrastructure

a path to success

Manukau to Drury South — a 21.5km four-lane corridor running parallel to the Southern Motorway with separate walking and cycling paths — will start in late 2022 and be completed in stages between 2025 and 2028.

These road and rail projects are all geared to providing easy access to a whole new town at Drury. Earthworks are already taking place for new housing, an industrial park and urban-designed town centre of shops, offices and landscaped public spaces.

An additional 120,000 people are expected to live in the surrounding area within 30 years and Drury will provide a further 38,000 jobs.

The long-awaited SkyPath across the Auckland Harbour Bridge for pedestrians and cyclists is expected to start early next year and be completed mid to late 2024.

It will become a popular visitor destination — with forecasts of 4500 pedestrians and cyclists a day or 1.64m a year by 2026, and 6560 a day or 2.4m a year by 2046.

The 2km SkyPath, with three 100m-long observation decks terraced down to create safe, sheltered seating areas, will be built alongside the bridge facing Stanley Point and city centre and attached to piers.

SkyPath is now part of the $360m project called Northern Pathway which includes a 3km SeaPath from the Northcote Point end of the harbour bridge to Esmonde Rd.

This completes a cycling network in Auckland which has been 10 years in the making.

Cyclists will be able to enter the network at Esmonde Rd from Northcote and Takapuna and ride across the Harbour Bridge to Westhaven, the city centre and Grafton Gully, then alongside the Northwestern Motorway and over the top of Waterview Tunnel on a dedicated path alongside SH20 to the Manukau Harbour.

Two congestion-busting projects will be underway late next year. The $410m Penlink, a new 7km tolled route between the Northern Motorway at Redvale and Whangaparāoa Peninsula, takes traffic pressure off the busy Silverdale intersection and business area, as well as the peninsula.

It also provides capacity for futher growth in the new residential developments of Millwater, Milldale, and Wainui. Penlink is expected to be completed in late 2025.

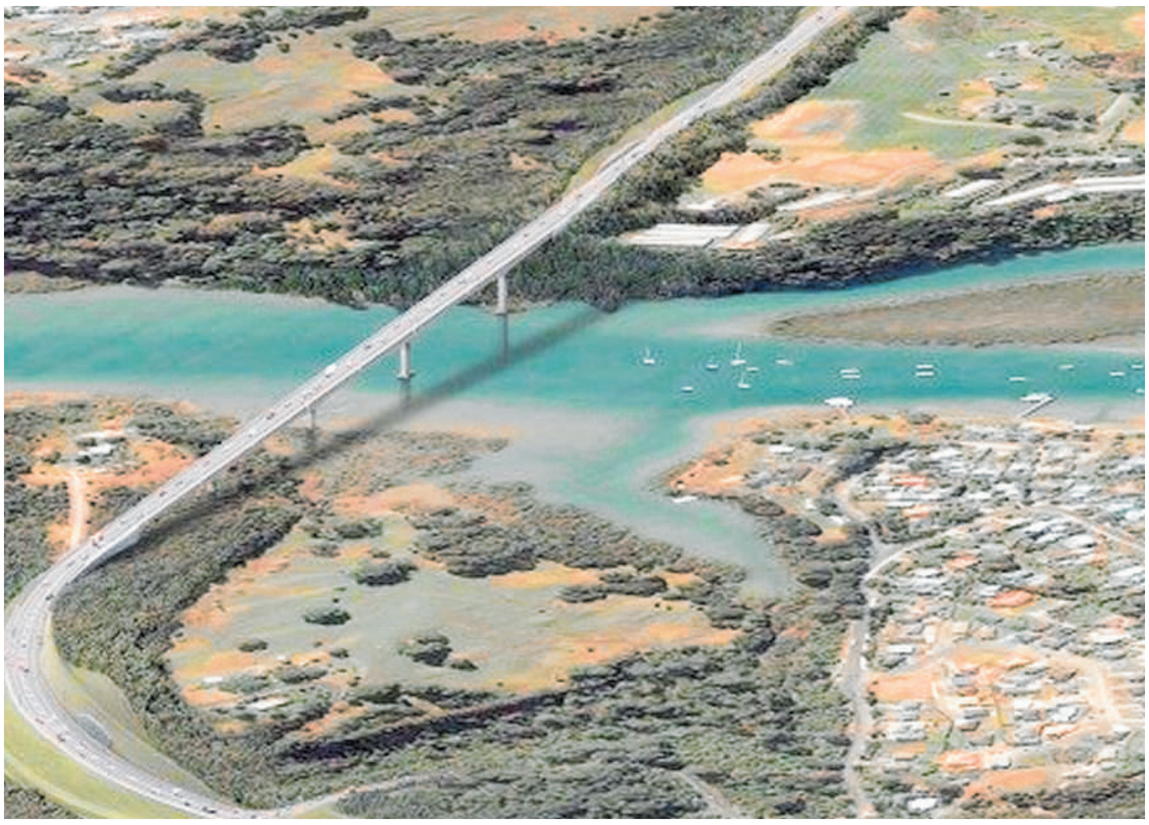
The 14km, $930 million Takitimu North Link out of Tauranga to fast-growing Ōmokoroa will rapidly improve safety on one of the country's most dangerous roads.

A tender request for the first stage of the new four-lane SH2 expressway from Tauranga to Te Puna has gone out and the design component is expected to be awarded by March.

There will be a separate cycling and walking path and a prioritised lane in each direction for buses, trucks carrying freight and cars carrying multiple people.

The construction, including grade separation for the Ōmokoroa turn-off, will take five years.

A further $100 million worth of road safety improvements are taking place between Ōmokoroa, Katikati and Waihi on this cluttered State Highway 2 over the course of the next four years.



The $410m Penlink, a new 7km tolled route between the Northern Motorway at Redvale and Whangaparāoa Peninsula, takes traffic pressure off the busy Silverdale intersection and business area, as well as the peninsula.

Infrastructure

Think big, or Think Better?

What will matter most is our approach to creating new infrastructure, write **Paul Buetow** and **Katrina Van Houtte**

Here comes a huge burst of activity, maybe. Big infrastructure spending stands to do great things for our economy and great things for our construction sector. But we have to move quickly.

Few of the projects published by the Infrastructure Industry Reference Group in August 2020 are truly "shovel-ready". Many still don't have fully confirmed funding, consents, or a sufficiently developed design. That puts them many months away from breaking ground.

The Covid-related disruption and delays of this year are also throwing timetables out. According to the BDO 2020 Construction Survey Report, 69 per cent of survey responses had contracts cancelled or delayed due to Covid-19. Current projects may come to an end before new ones are ready to start. Time lags and disruptions create gaps in the pipeline of work and that makes it harder for contractors to keep people in work. With Australia reopening we would not be surprised to see more workers crossing the Ditch for job security, aggravating an already acute resource problem.

So the pressure is on to move these projects along more quickly. How?

There's no question that procurement processes can be sped up. They can be very protracted.

One clear option is to set aside the requirement of Government procurement rules that all contract opportunities have to be openly advertised. It's permissible, in qualifying emergency circumstances, to do that. We would suggest this is one such occasion and would avoid duplication of resources with having multiple teams tendering the same project.

Of course tenderers still need to be confident of a fair process so another option is to use Alliance models, in which the various parties, who would in usual circumstances contract to one another, come together as one team. Done well, it can ensure a faster execution — you can mobilise quickly and run in parallel with the initial design and consenting. Essentially the risks are managed through high transparency, with everything done on an open book and no-sue basis. The various parties have the confidence to work together and innovate. Likewise, Early Contractor Involvement enables contractors to be engaged sooner on non-price attributes with pricing work happening in parallel with design work.

The procurement process can also be streamlined by not reinventing the wheel. Bundling similar projects into a "framework agreement", whereby the initial project serves as a precedent for further similar contracts makes it possible for qualifying contractors to line up multiple jobs, and set up a pipeline of work. The more secure the pipeline, the more ready they will be to retain and invest in their staff.

More broadly, we see this burst of activity, as a golden opportunity to reassess wider considerations.

In particular, it would be good to see more action on the concerns identified by Treasury in its August 2019 report into the issues associated with the NZS Conditions of Contract. There's good progress being made, but there's still work to be done to avoid unfair transfer of risk to contractors.

We've seen, through the Covid-19 experience, that a consistent and fair approach from Government to addressing matters concerning risk allocation results in better outcomes and fewer disputes. Through the Construction Sector Accord, MBIE acted quickly to issue industry guidance on the treatment of variation claims for lockdown costs under Government contracts. We believe this averted an avalanche of disputes. The vast majority of these claims have now been settled amicably and collaboratively between the parties. Outcomes of that kind build trust and lead to better project outcomes overall.

What are the prospects for PPP contracts? Given the difficulties that have been encountered with Covid-19 and the inquiry into the Transmission Gully project, we do not see this Administration having much enthusiasm for new PPPs. But private funding and financing of infrastructure, done well, can help. Developing new refined models with a more balanced risk allocation will need to be considered.

We see the appointment of Grant Robertson to the Infrastructure portfolio as a recognition of its vital importance which should boost momentum for the sector. What is less clear is how Infrastructure overlaps with the other portfolios — Michael Wood (Transport), Megan Woods (Housing), Poto Williams (Building and Construction).

Looking out past the shovel-ready projects, where should infrastructure activity be focused?

In terms of resilience, the management of congestion and public transport planning, should Auckland harbour crossings move up in priority? Recent problem leading to the closure of lanes and, for a time, the whole bridge, showed up the need to address the vulnerability of this critical piece of infrastructure for Auckland, and brought into urgent focus the question of a second crossing and its relative priority to other projects.

And what now for light rail? Where might it now sit in relation to other infrastructure projects, given a change of Minister and the exit of New Zealand First, who opposed it? And who will now deliver it?

Perhaps what will matter most is that our approach is not so much Think Big, as Think Better.

● *Paul Buetow and Katrina Van Houtte are partners the Construction and Major Projects team at Dentons Kensington Swan.*

The Transmission Gully project may have dampened enthusiasm for new PPPs. But private funding and financing of infrastructure, done well, can help.

We've seen, through the Covid-19 experience, that a consistent and fair approach from Government to addressing matters concerning risk allocation results in better outcomes and fewer disputes.

You need a plan to keep one step ahead

Christina Sheard

● *Christina Sheard is a partner in the Environment and Planning team at Dentons Kensington Swan.*

Are we ready to go, from a resource management consenting point of view?

The Covid-19 Recovery (Fast-track Consenting) Act 2020 was hastily passed as an immediate stop gap to give infrastructure and other development an adrenaline boost and stimulate economic recovery. It provides a fast track consenting process where applications are heard by an Expert Consenting Panel and there are limited submitter rights and limits on the right of appeal. The hearing process takes between 6.5 and 10 weeks.

The Act lists 17 specific projects to which the process applies — 9 are infrastructure projects. The rest are residential projects. Only one listed project has been approved so far, for the Matawii water storage project.

Other projects can apply to the Minister for the Environment to use the fast-track process. There are no timeframes for the Minister's approval. According to the Ministry for the Environment website, 24 projects have been applied so far, 13 are currently processing, two have been accepted for referral, two referral orders have been made and seven have not been referred.

It remains to be seen how many infrastructure projects will use this process. Undoubtedly the fast track process is a much faster and more efficient consenting route for infrastructure projects that are listed in the Act or can get the Minister's approval for referral to an Expert Consenting Panel. Drawbacks include the fact that the Act does not fast track the Public Works Act process, so where the land required for an infrastructure project is not already owned by the infrastructure provider, delays may still occur even when consents are in place. There is also a risk that, if not carefully managed, any accelerated process that limits public involvement could damage stakeholder relationships, community involvement and the quality of the outcome.

In the medium to longer term, reform of the Resource Management Act is now inevitable. The RMA Review Panel has proposed a comprehensive overhaul of the resource management system. The review provides the opportunity to put in place a statutory regime that helps us address our historic underinvestment in infrastructure, but also enables the much needed stimulus in the economy that investment in infrastructure creates. The Review Panel's proposed focus on spatial planning has the potential to radically change the way we approach infrastructure planning. The aim would be to not only catch up, but to have a coherent plan of where to direct infrastructure investment next in order to keep ahead.

To keep one step ahead you need a coherent spatial plan, an efficient consenting process and effective funding mechanisms.

Infrastructure

Strengthening our resilience

ICBC's Karen Hou tells **Tim McCready** the bank is poised to make a stronger contribution to New Zealand

Infrastructure is one of Industrial and Commercial Bank of China (ICBC) Group's strategic sectors. Karen Hou, ICBC NZ's chief executive, says this focus extends to New Zealand, and has been an area that she and her team care deeply about.

"When you consider infrastructure, it is about delivering long-term projects," she says. "It is not about short-term profit or short-term achievements, but instead requires a long-term vision."

She notes that infrastructure not only helps to build the economy but also helps with the country's resilience.

Hou says while Covid-19 demonstrated that New Zealand can be very resilient, other recent events — including the International Convention Centre fire and the damaged Auckland Harbour Bridge — show that resilience in infrastructure is an area that needs bolstering.

"We are operating here in New Zealand because we are committed to providing the long-term support required to strengthen the resilience of the country's infrastructure," says Hou.

"We are interested in all aspects of infrastructure — bridges, railways, motorways, water, power, schools, hospitals, ports, airports, aged care — these are all important areas of infrastructure that will provide fundamental support to the country and help the economy."

It is not about short-term profit or short-term achievements, but instead requires a long-term vision.

Karen Hou

Boosted capacity for funding

In May this year, the Reserve Bank announced it had granted ICBC a licence to operate directly as a branch in New Zealand.

While ICBC NZ will continue to operate in New Zealand as a subsidiary, Hou says the branch licence allows the bank to make a stronger contribution to New Zealand by bringing the consolidated Group balance sheet into play to support local projects. "With this licence, we have a greater capacity for lending in New Zealand — especially into infrastructure and green projects," she says.

ICBC NZ has been active in New Zealand for over seven years now, and has already been involved in several of New Zealand's major infrastructure projects.

One of the first projects ICBC NZ became involved in was Transmission Gully. ICBC NZ, along with ICBC Sydney Branch, provided around NZ$100m in the banking syndication to fund the public-private partnership project.

The 27km four-lane project will provide safer, quicker, less congested and more reliable route, bypassing many existing bottle-necks and the more hazardous stretches of the existing SH1, and connecting Wellington to the growing economic centres of Kapiti and the Manawatu and subsequently the wider North Island.

ICBC NZ, along with ICBC Asia, has also recently provided funding to assist Napier Port with their capital investment programme, which includes the development of the new 6 Wharf. "We have been able to leverage the wider ICBC Group's global resources for this project which provides more funding capacity to our client," says Hou.

In the 10 years prior to Covid-19, Napier Port has experienced a 50 per cent increase in containers, 94 per cent increase in cruise ships and 64 per cent more bulk cargo.

The new 350-metre-long wharf, for which construction commenced earlier this year, will be a crucial piece of infrastructure for Hawke's Bay. It will future-proof the port, allowing it to handle larger ships and improve operational performance.

International experience

ICBC NZ has been a long-time supporter of the Infrastructure NZ symposium and is again a sponsor for today's conference. Now in its fourth year of sponsorship, ICBC says this long-term support reflects its commitment to New Zealand's infrastructure industry as a whole.

ICBC NZ helped co-ordinate Infrastructure NZ's delegation to Singapore, Hong Kong, Beijing and Shanghai last year, which included sessions on the national, regional and city governance, their economy and infrastructure funding and financing, masterplan of these mega cities and transport system, and how these countries and areas look at prioritising their investment planning.

Hou says some of the experiences from international practice for New Zealand include the public-private partnership models, alternative construction methods and new funding mechanisms.

Modular construction is an area that quickly gained momentum in international practice and is something New Zealand should consider. In modular construction, the components of a project is done away from the construction site, and then delivered for assembly. This can include buildings, ships and other key pieces of infrastructure. The use of this method can dramatically increase the speed and lower the cost of large-scale infrastructure projects.

Another example is infrastructure leasing, which is a funding mechanism ICBC uses with operators across Europe, Asia and China, and Hou says is something that could be considered for the delivery of some New Zealand infrastructure assets. This type of funding is often used for aircraft or maritime vessels. "There is a leasing financial team within ICBC Group in China that specifically works on this funding model," says Hou.

Outlook for the Future

Hou says the Covid-19 pandemic has seen New Zealand raise its profile and position in the world due to its adept management.

"New Zealand has proven to be one of the most successful countries to manage the pandemic, which sets the country up well for future investment — because people want to invest in countries that can demonstrate they are resilient," she says.

Hou hopes that the opportunity the recovery presents will help New Zealand with its economy, and ultimately ensure its infrastructure is as resilient as it can be.

Infrastructure

TasWater installed 24 treatment plants within 18 months to improve the quality of drinking water in Tasmania's small townships.

A clear solution for water

With New Zealand considering water reform, it should cast its eye over the changes and improvement in the services delivery in Tasmania, writes **Graham Skellern**

A regulator, a policy-maker and a service provider — this is about the ideal combination for delivering quality water management systems to communities, says an Australian expert Tony Kelly.

"Australia has applied tremendous commercial discipline to its water services and resources, and its corporatised system has become the envy of the world," says Kelly, adjunct professor at the Sydney University of Technology, independent director of TasWater and former managing director of Yarra Valley Water.

Kelly has been closely involved with water reform in Australia and across the Asia-Pacific region over the past 40 years, and is this week making a keynote address via video to Infrastructure New Zealand's ReBuilding Nations symposium in Auckland.

He will be telling the audience that the Australian model of government setting policy, utilities delivering the services (drinking water, stormwater and wastewater) and independent economic regulators setting prices works very well.

The water utilities have skilled-based corporate boards which pay dividends to local councils, consult closely with communities and develop long-term, affordable working plans which are updated based on latest data.

"Scale is important. Utilities need a strong balance sheet to carry debt and fund improvement programmes in a sensible way, to subsidise remote rural communities, and to attract good staff.

"The independent price setting is important because it provides confidence that someone is overseeing the whole process with rigorous capex analysis and cost control, and customers are not being ripped off. When the utilities receive the price, they are very clear about what is expected of them to deliver the water supply.

"The whole process is very transparent — everything goes on the internet, the consultation and the price application. Most of the utilities also have to provide data for national and state reports, and their performance on a whole suite of key performance indicators are compared for the whole world to see. I like to think of it as a comparative competition model. It keeps innovation alive and people on their toes."

Kelly said the water exchanges such as the Waterfind online trading platform enables water to be allocated between farmers and utilities, and the supply goes to where it's needed — for example, in times of drought and water shortage.

The Waterfind exchange provides access to buying and selling water 24/7 through a mobile phone or personal computer and enables people to plan their water needs. Treated domestic water normally trades between $1-3 cu m and rural bulk water is a fraction of that price.

Kelly said the bulk water entitlement regime in Victoria — legal rights to water granted by the Minister of Water — has been effective. The utility owns the water in the dams and has some control of the land use in the surrounding catchments for common sense activity such as planting alongside rivers to minimise effluent run-offs.

Australia has applied tremendous commercial discipline to its water services, and its corporatised system has become the envy of the world.

Tony Kelly, adjunct professor in Sydney and director of TasWater

"Melbourne is blessed with two very large protective catchments where farming and other activities are not allowed. All you need is a squirt of chlorine and fluoride and you have virtually untreated drinking water."

Kelly said the Havelock North drinking water contamination (in 2016) was a warning to the Government that maybe everything is not managed as it should be.

"I invite New Zealand to look at what Australia has done and pick the best elements from its water management," said Kelly, who led Yarra Valley Water for 11 years and was a director of the Philippines-based non-government organisation WaterLinks for five years.

WaterLinks facilitates partnerships between utilities and policy makers to improve access to urban water and sanitation services through the Asia-Pacific region. He is also an advisor to Israeli water software provider TaKaDu and British billing company Echo Managed Services.

The New Zealand government is pushing ahead with its three waters reform, having created Taumata Arowai, the new Water Services Regulator to oversee and enforce a new drinking water regulatory framework, with additional oversight for wastewater and stormwater networks.

There has been an under-investment in three waters infrastructure in parts of New Zealand and persistent affordability issues, and now there is the need for additional investment to meet improvements in freshwater, increase resilience to climate change and natural hazards.

In July, the government announced a funding package of $761 million to provide immediate post-Covid stimulus to local authorities to maintain and improve the three waters infrastructure, and it has established a central and local government Three Waters steering committee to work on reform.

The Government has indicated it is looking at public, multi-regional models to manage the water services and realise the benefits of scale for communities. The regional entities would be shared ownership of local authorities. At present there are some 65 council organisations delivering water services throughout New Zealand.

Kelly points to Tasmania as the classical example of establishing an efficient and commercial multi-regional water utility. TasWater, operating from July 2013 under the Corporations Act 2001, operates at arm's length to the state government in return for clear accountability for outcomes.

It now has $2 billion total assets, more than 390,000 water and sewerage connections, more than 11,000km of sewer and water mains, 62 drinking water systems and 955 water and sewage pump stations.

Tasmania's water, sewage and drainage services were initially managed by 29 local councils, and Australia Infrastructure identified that the state had the worst systems in the country and the situation would only get worse, said Kelly.

In 2008 three utilities — Ben Lomond, Cradle Mountain and Southern Water — were created to cover the northwest, northeast and southern regions of Tasmania, and also managed a shared services provider Onstream for billing and other administrative functions. The councils became shareholders of the three utilities in their respective regions, and Southern Water installed 54,000 water meters for the first time.

Kelly said the problem was that these utilities discovered they didn't have the scale needed to undertake the improvement work. The northwest for instance, wasn't heavily populated and the utility didn't have the customer base to service the infrastructure required to support the rural communities.

The state government merged the three utilities into TasWater under the Water and Sewerage Corporation Act in 2012, and the 29 councils received a portion of the dividend amounting to about $30 million a year from the utilities.

"In 2017 we had a very serious issue with 24 small towns throughout the state having to boil their water before drinking after they were issued with 'do not consume' notices by the health regulators," said Kelly. "Tasmania was a tourist destination, and its clean, green image was at stake."

TasWater and the council shareholders made an agreement to contribute $10m each towards an upgrade — with the councils foregoing $10m of their dividends. TasWater borrowed the remainder for the $60m capital works programme and within 18 months installed sophisticated water treatment plants in each of the 24 towns.

"The councils couldn't afford such a capex programme. TasWater fixed the problem, and Tasmania now has best practice and meets the Australian drinking water guidelines," Kelly said.

TasWater has quarterly meetings with the council shareholders who approve a rolling three-year work plan. "Every time we meet they give us a tough time but no one council dominates and there's always a sensible consensus. The meetings are a great discipline on the utility to improve levels of service.

"My piece of advice here is: I've been through water reform in Melbourne, Tasmania and other states. There's a lot of toing and froing to get to the final solution — don't expect it all to happen overnight, and think that sometimes you have to put on a state or country cap and take off your local hat."

Infrastructure

Bridging the troubled water gap

Fletcher Building's boss tells **Tim McCready** the consequences of climate change require urgent attention

Brookvale Road water sampling point, in Havelock North. A review followed the 2016 campylobacter contamination crisis.

Water is New Zealand's most valuable asset and the biggest infrastructure challenge of the next decade.

That is the view of Fletcher Construction chief executive Peter Reidy, who says New Zealand's water infrastructure is well overdue for investment as pipes reach the end of their useful lives.

Reidy says that more than a third of wastewater treatment plants will require re-consenting within the next decade, and almost a quarter are operating on expired consents. Conservative estimates are that the cost of upgrades and renewals will be measured in billions of dollars.

"The public's environmental expectations are also increasing and the consequences of climate change, including more frequent and more intense droughts, require urgent attention," he says.

Over the past three years, central and local government have been considering how to address the challenges facing delivery of three waters services (drinking water, wastewater, stormwater) to communities. The review followed the 2016 Havelock North campylobacter contamination crisis that exposed systemic issues in the regulation and provision of three waters.

The result has been the establishment of Taumata Arowai as a Crown water regulatory body to administer and enforce a drinking water regulatory framework, with additional oversight on improving the environmental performance of wastewater and stormwater networks.

Having water utilities at scale will allow for greater investment in digital solutions to water.

Peter Reidy

In July this year, as part of the Covid-19 stimulus, the Government announced $761 million in funding to maintain and improve three waters infrastructure and to support the reform of local government water services delivery arrangements.

At the funding announcement, Local Government Minister Nanaia Mahuta said there are "massive looming costs across the three waters networks" and the current delivery arrangement, particularly for smaller rural and provincial councils, are not well-placed to meet them.

Although councils currently own and manage most water services, the investment from Government was made contingent on local councils opting in to the government's wider reform programme.

Fletcher Construction supports the Government's plans to reform the way we manage water.

"At the end of the day it is all about customers — improving environmental standards, value for money and productivity for customers," says Reidy. "Having water utilities at scale will also allow for greater investment in digital solutions to water."

Fletcher Construction has brought together two of its businesses — Fletcher Construction Infrastructure and Brian Perry Civil — to support the establishment of capital construction plus operations and maintenance for water assets to help local government meet their challenges.

In September, Fletcher Construction along with Fulton Hogan signed a $2.4 billion contract with Auckland Council-owned Watercare Services for the delivery of water and wastewater infrastructure for Auckland over the next 10 years.

Watercare said the long-term, collaborative partnership is a first for New Zealand. The planned programme of work — rather than discrete projects — is expected to help drive greater cost-efficiency and innovation. A key goal is Watercare's aim to reduce carbon in infrastructure by 40 per cent by 2024, to reduce the cost of its infrastructure programme by 20 per cent by 2024 and to "improve the health, safety and wellbeing of all people involved in delivering our infrastructure by 20 per cent year-on-year."

Reidy says the 10-year partnership with Watercare was secured under a new enterprise model which has audacious cost and sustainability goals. "This is a transformational model of partnership built around carbon reduction, safety improvements and cost savings that challenged our team to collaborate across their specialty areas," he says. "Watercare has changed the way it partners and that has stimulated Fletcher Construction to respond in a way that puts safety, sustainability and innovation at the core of our model."

Reidy says it is that kind of model that could work across the country.

"With Wellington Water we are also offering more than just a straight subcontractor model. And that's because real progress can be made when deliverers are embedded within planning and project teams."

Reidy says the Government has started this conversation, but we all need to collaborate together to find the solutions. "That's critical for our cities, our waterways and our people," he says.

Shovel ready projects

The Government's focus on infrastructure investment to drive our economic recovery is important — infrastructure investment supports seven jobs for every $1 million spent. In the last recession the sector lost eight per cent of jobs and business and we know that once lost, it's slow to return.

That add costs to future projects and slows economic recovery.

It's been very pleasing to see that the Finance Minister is now also the Minister for Infrastructure.

That shows the value the Government see in the sector.

In Auckland alone over the past three years, $6 billion of large projects have been released and are active in the market. That's a really positive future for the industry, but it's created a squeeze on specialist technical and project management skills. Those people are just not available in New Zealand right now because of the number and size of projects underway.

The civil construction industry has identified about 1200 specialist workers that will be needed over the next 18 months on critical, large, national infrastructure projects if we are to avoid costly delays.

We have to find a safe way to bring them into the country and ensure existing international people that are already working on large projects are able to visit family in their home countries. We can only do that by working with the Government on the issue.

The Government's apprenticeship boost scheme is really positive — thousands of new apprentices have been taken on but as an industry we need to be looking for diversity in that group — it's critical if we are going to build back better for generations to come.

That means making the industry attractive for all people and we have some work to do there.

There is a real desire from Government to get projects out quickly but as the Construction Accord has identified, there are issues around transparent risk allocation.

The only way to go faster is to do it together. We are seeing some new models coming out — Waka Kotahi in particular is bringing parties to the table on more than just price.

One area that will need more Government investment is vertical construction — private investment in commercial buildings is showing signs of a significant slow-down.

We are highly reliant on Government to stimulate it through health and education or we will lose our skilled commercial construction resources to Australia, as happened during the Global Financial Crisis period.

— Peter Reidy

Infrastructure

The 17km headrace canal through the Canterbury Plains delivers irrigation between the Rakaia and Waimakariri Rivers. Below: The NX2 roading project between Puhoi and Warkworth.

Supercharging project delivery

China Construction Bank has quietly gone about helping spur the New Zealand economy, writes **Graham Skellern**

China Construction Bank, the world's second biggest on assets, is ready and willing to add scale and experience to financing New Zealand's major infrastructure project, and help grow the economy.

"The bank has a long history of infrastructure development and financing, and we have placed a strong strategic focus on primary industries, infrastructure and energy in New Zealand — these sectors make up 75 per cent of our client base," said Grant McKeown, head of corporate and institutional banking with China Construction Bank (New Zealand).

"New Zealand has long stated it has an infrastructure deficit and we have demonstrated our capability by supporting leading corporate entities and project sponsors. The bank is here to help fill the infrastructure investment gap."

China Construction Bank, listed on the Hong Kong and Shanghai stock exchanges, has total assets of more than $NZ5.6 trillion and its 2019 net profit was $5.96b. Based in Beijing, it has nearly 15,000 banking outlets employing some 350,000 staff in 30 countries and regions.

Having been heavily involved in China's modern-day economic growth, the bank is well positioned to structure, arrange and execute large scale project financing transactions in New Zealand on both bilateral and syndicated terms.

"Since the signing of the free trade agreement in 2008 there has been an increasing flow of trade and capital between China and New Zealand. That flow will increase. We can be a conduit and see our role as adding value or enhancing those flows," said McKeown.

New Zealand has a penchant for funding and completing major projects in stages. But McKeown argues that the financing and construction of the projects can be done in one big burst — at lower cost and earlier completion.

"Making the investment up front can deliver project value outcomes earlier. If it is staged, the value reality is further out in the future — that has a cost," he said.

He likens it to building a house: Do you build the kitchen and living room one year and then add rooms over each of the next four years. No, you get the most value out of building the whole house at once.

"Most Kiwis have no problem going to the bank to get all the financing or mortgage up front to build their home. We don't do the same for infrastructure projects. If we bring a housing mentality to infrastructure, then we will be away laughing."

McKeown said China has shown the value of scaling up construction. China, for instance, has built some 35,000km of high-speed rail in the past decade.

"It has a huge wealth of engineering capacity to bring to New Zealand if there is a major transportation project to be done. Why shouldn't New Zealand benefit from this?

"The bank would relish the opportunity of bringing scale and pace to the infrastructure market with its associated cost savings and seeing value created in New Zealand."

China Tiesiju Engineering Group, one of the world's largest construction companies, made an unsolicited bid in 2018 to build and operate a four-lane Penlink route near Silverdale and pay for it through tolls. Nothing materialised. Construction of the 7km Penlink between the Northern Motorway and Whangaparaoa Peninsula — now two lanes only — will be starting later next year and take four years to build — and it will be tolled.

The bank would relish the opportunity of bringing scale and pace to the infrastructure market with its associated cost savings and seeing value created in New Zealand.

Grant McKeown

McKeown fully supports the Government's moves on infrastructure and funding legislation passed in August, and he is waiting to see the finer details of the $12 billion New Zealand Upgrade Programme.

"Is it $12 billion cash and 100 per cent equity for the projects, or is it $12b leverage to turn it into $60-70 billion funding?

"Utilising the funding legislation and bringing in financing partners would supercharge the delivery of the projects. Why not move forward quickly with strong partners?"

McKeown would like to see a 10-year infrastructure pipeline clearly laid out with real timing and associated funding and financing requirements. "I'm a big supporter of the Infrastructure Commission being an independent tool for the prioritisation of infrastructure — at least there's a plan as it's hard to resource an aspiration list.

"The commission may say the next national priority is to spend $1b this year on light rail in Auckland but the Minister may authorise the third best project with reasons. At least we are going off a framework rather than an aspiration list.

"Clarity is what is required for international funding partners."

China Construction Bank (NZ), which was registered as a subsidiary in 2014, then a branch in 2017 and operating with more than 65 staff, has been involved in a variety of infrastructure and corporate activity over the past 15 years.

The bank was the mandated lead arranger for the NX2 Group public-private partnership responsible for financing, designing, building, maintaining and operating the Puhoi to Warkworth Highway for up to 25 years — underlying ownership is retained by the Crown.

The $800m project, which began in November 2016 and because of Covid-19 delays will be completed by May 2022, is 90 per cent debt funded. The Government will pay back the loan over 25 years based on available and performance-based annual payments.

The 27km four-lane Transmission Gully motorway from Mackays Crossing to Linden in Wellington is the only other transport public-private partnership operating in New Zealand at present.

China Construction Bank (NZ) was a lender to the $422m Central Plains Water Enhancement Scheme in Canterbury, which irrigated 63,000ha of farmland between the Rakaia and Waimakariri Rivers.

The scheme was completed in 2018.

It included building a 17km-headrace canal delivering water from the Rakaia River into a 130km-long piped distribution network.

"We were the first international bank to join ANZ and Westpac in the project which in turn supported high-value exports from the agricultural industry," said McKeown.

The bank was the sole funder of the six-level KiwiBuild Sunset West apartment building in the Cuba quarter, Wellington, and it financed New Ground Capital's build-to-rent housing in Hobsonville Point and Whenuapai in Auckland.

It also helped finance Top Energy's Ngawha Springs 31.5MWE geothermal power station near Kerikeri, designed and built by Israeli experts Ormat. China Construction Bank (NZ) provides general funding for the Auckland, Wellington and Christchurch airports, and the Wellington and Lyttleton ports, which all have expansion plans.

The bank also provides revolving credit facilities to corporates such as Investore Property, Vodafone, Fletcher Building, Mercury, Fonterra, Firstgas, Kiwi Property and Contact as it helps enhance the national economy.

Unlocking private funding and innovation

Private sector investors can make a significant contribution to major infrastructure in New Zealand say **Tom Hunt** and **Bevan Peachey**

As the Government enters a second term, it has drawn the finance and infrastructure portfolios together as part of its overarching priority to drive economic recovery from Covid-19. The Government also has ambitious plans to address New Zealand's infrastructure deficit, which is particularly acute in areas such as transport and water supply, and to accelerate the transition to renewable energy.

In the context of the focus on infrastructure and how it can be funded, it will be important to find ways to harness the funding and expertise available in the private sector.

What are the benefits of private finance?

Private sector investors can make a significant contribution to major infrastructure in New Zealand. They obviously bring new sources of funding (demonstrated in recent years by the large-scale investment in infrastructure projects, including public private partnerships) but with the right structures in place, they also remove risk from the public sector and bring expertise, innovation and high-quality management of infrastructure assets.

Private sector investment also brings rigour to business case development and risk assessment that can help direct investment towards the projects that offer the best outcomes (that is, projects that will deliver a justifiable return on investment, whether from a financial, wellbeing or climate perspective). Bringing the public and private sectors together can unlock a new source of funding and deliver innovation, expertise and collaboration to achieve a better overall outcome. As an example, private finance has been used in Australia for major expansions of public transport networks and for the drive into renewable energy.

What models are available for private finance?

There are a number of models that can be adapted for new infrastructure projects. The Government has already begun work on coordinating the infrastructure pipeline and finding new ways to unlock private sector investment in infrastructure delivery. For example, the Infrastructure Funding and Financing Act 2020 (IFF) offers a new model for the provision of housing and urban development using special purpose vehicles to raise finance for new or upgraded infrastructure, with the cost paid over time through the rates system.

The range of contractual and funding structures available offer choice and flexibility and can be adapted to fit the needs of each project. New Zealand already has expertise using special purpose vehicles to finance new or upgraded infrastructure. These were used for public private partnerships in the 2010s and adapted by the Government for the IFF model as well.

There is a great deal of experience and expertise in the private sector in structuring and funding new renewable energy projects.

One successful model used offshore is the co-investment model, where a Government agency invests alongside the private sector. An example of this is the mutual investment model adopted in Wales. The structure is based on a public private partnership but with a Government agency investing in the special purpose vehicle alongside the private sector. Another example is an infrastructure bank that unlocks co-investment from the private sector.

> We should . . . harness the benefits of private sector funding and keep learning from best practice and innovative solutions around the world.

This approach ties in nicely with the Government's focus on climate change.

There are a number of examples overseas of a government-sponsored investor being established to grow the green investment sector in partnership with the private sector. In the last term, the Government took some initial steps in this direction by establishing Green Investment Finance to catalyse the development of a green investment market and facilitate private investment. There is a great deal of experience and expertise in the private sector in structuring and funding new renewable energy projects (including wind and solar in Australia) that can be harnessed to help achieve New Zealand's development of new renewable generation and electrification of transport networks.

What about risk allocation?

A key issue is ensuring that for any project the risks are managed effectively and transparently through the contractual frameworks. This needs to involve an honest assessment of which party is best placed to bear the risk. Some risks and responsibilities sit more naturally in the public sector because the private sector is unable to price and manage those risks (the recent Covid-19 shutdowns might be an example of such risks).

While there have been challenges in some public private partnerships (in New Zealand and elsewhere), these often arise from the complex nature of the projects involved, and the contractual frameworks need to have transparent and robust ways for managing these projects.

New Zealand has built up considerable experience and expertise from private sector investment in infrastructure projects in the past 10 years. We should take the learnings from those projects, continue to harness the benefits of private sector funding and keep learning from best practice and innovative solutions around the world.

● *Tom Hunt and Bevan Peachey are infrastructure specialists at Russell McVeagh.*

Playing infrastructure catch-up

Decades of under-investment have left NZ with an infrastructure deficit and we're not alone, writes **Bill Bennett**

Van Tang wants us to rethink infrastructure and the role it plays in our society.

Tang is the New Zealand and Pacific regional general manager for GHD, an international professional services company in the infrastructure sector.

To her there are three parts to rethinking infrastructure.

First, she says it means designing new infrastructure with the user at the front of mind. Second, it means getting behind more innovation in the sector and improving how companies in the sector collaborate to get projects moving faster.

The third part is rethinking the wider role that infrastructure plays. That's urgent. Governments around the world are pouring a lot of money into infrastructure.

Tang says one question facing governments is where to spend infrastructure money."Where can you extract the greatest value for the infrastructure spend? This is not only about cities, but also about our regions and communities.

"Infrastructure is a connector in so many ways. It connects communities and connects people. It improves our health system. It's there to improve the environment in a sustainable way. There is a whole range of things it can do."

Much of the new infrastructure spending is about catching up. Tang says years of unprecedented growth and increasing economic, environmental and social challenges have left us with congested, disconnected and degraded cities. It's not only cities. There's also an infrastructure deficit in regional New Zealand.

In New Zealand the deficit stems from decades of underinvestment. Yet, Tang says the problem is not unique to this country. She arrived to lead the New Zealand business early this year after leading GHD's South Australia operation. "To a certain extent infrastructure is not keeping up with growth. We see that here in New Zealand and in all parts of Australia, yet it's a general theme across the world."

Tang's colleague, Melbourne-based Phillip Bradley, is a member of GHD's international executive management group. Other members are in Australia, New Zealand, Canada, the UK and the US. He is also the organisation's group chief financial officer. Bradley says infrastructure has become the world's go-to stimulus strategy. "That's because it creates jobs and leaves something meaningful for the long term."

He says this creates a problem for New Zealand: "One of the challenges you face is the competition for skills and resources. We're already seeing a substantial step up in the demand for specialists. It's happening in water, transport and other areas. It's already affecting the US and Australia.

"New Zealand can't wait because you may get left behind and the best resources in the world won't come."

Bradley says the good news is that New Zealand is a favoured place and many skilled people would love to be there right now.

Top: Emergency work carried out for Wellington Water Christmas 2019; Above: Lifting the Canada St bridge into place.

> We need to have new conversations within the industry and the wider sector.
>
> Van Tang

Tang and Bradley want to see a rethink of infrastructure planning and procurement.

Tang says this means working with clients and the client's clients to imagine new possibilities. "To do this we need to have new conversations within the industry and the wider sector. Sometimes these conversations start too late, when we're already going down the path."

At the top of the list for rethinking planning and procurement is changing the approval process. Bradley says approvals are expensive around the world, especially in New Zealand, Australia and California.

"There is so much regulation. Regulation in itself is not a problem because it is the government trying to protect communities. Yet it takes time, often many months, for an application to be heard. Often the hearing or the actual approval process is less than a day's work. A lot of institutions don't have the workflow to get things moving faster."

A significant proportion of the cost of infrastructure lies in dealing with approvals. Bradley says when we went into the Covid-19 lockdown, organisations managed to compress processes that would take months into a few days. They didn't wait around when it came to sending people home to work.

"This means we know we can change processes. Some of it is that you don't do things that are not important. Some of it is about being more efficient out of necessity. And some of it is about empowering more people to make decisions.

"You can do that with technology. In business we are driving the automation of processes that don't have people adding value. If we could do that with the approvals, say we could get a response within a week, that would take a lot of cost out of infrastructure."

The cost of the approval process is more than getting the paperwork done. A holdup means expensive resources such as cranes might be sitting unused which can cost thousands a day. The cost of approvals compounds as projects get larger. This matters now there are more billion-dollar projects in the pipeline.

Bradley says in Australia, GHD is working on four projects that are worth over $10 billion. Solving the problem is about mindset and leadership. Yet, Covid has given the industry a template that says these things can transform.

Tang says the way we fund infrastructure projects needs a rethink. Take local and central governments. They often face debt ceilings, so some creativity is needed. Last year Napier Port listed on the NZX. The company raised $234 million in exchange for 45 per cent of the equity. Tang says this is an innovative approach that created a partnership with stakeholders including iwi, financial partners and the community.

Bradley says overseas observers see Napier Port's listing as an innovative move. Selling assets to pay for infrastructure like road or rail is not new. Yet in this case, the community gets to keep its asset and has money for an extension of the asset.

Rethinking digital innovation's role in infrastructure

GHD group CFO Phillip Bradley says his organisation has been rethinking the role of digital technology in infrastructure. He chairs a group that investigates the future role digital tools might have in the business. He says this is something that has accelerated this year with the move to remote working.

"There's been some amazing use of technologies," says Bradley. "An example; we have experts in some part of the world, or another part of the same country who are not able to travel.

"Six months ago we would always send the expert on site. Now we can find someone who is fit and active. We equip them with a headset that has a camera, a microphone and remote connectivity. They can work on a field site. They record and transcribe everything."

Van Tang, GHD's New Zealand and Pacific regional general manager, says using technology this way has allowed some specialists to extend their working life.

Phillip Bradley

It has also meant that during the Covid-19 lockdowns, New Zealanders could continue to work on projects around the Pacific.

"We had our local Pacific teams continue work on site," says Tang. "They had the necessary background, but maybe not all the expertise. They could stay on site with the camera and undertake site inspections.

"At the other end an expert would be reviewing, looking at certain things and reinforcing the on-site person. They might say: 'Okay, that's good but can you go and double check these areas?'"

Tang says the projects haven't stopped, but GHD is delivering them in a different way. "It's not just that we've had to be open to delivering projects in different ways, it's also that clients have to learn to accept the virtual delivery of projects."

Bradley says this approach is about shared experiences. "We've had a case where a graduate was in the field working with a remote expert. The graduate came back and said he felt as if he was in the expert's head and that he had learnt more in that process than ever before."

Within GHD there is talk of the Covid effect. Bradley says necessity is the mother of invention. "A number of times we scratched our head wondering what to do next. But people are amazing at finding new ways to do things and to do them effectively and safely in such a way that we found ourselves looking back and realising we could have done things this way before.

"It's important that we keep on thinking that way, we now know we can do things differently and that distance doesn't have to be a barrier."

Tang says the experiences people had early on during the Covid-19 pandemic gave them the confidence to push further. "What we did as an organisation transferring to working from home and virtual working all happened in a matter of days.

"If we had previously written a business plan and said it would take three days, we may have thought it irresponsible or reckless. Yet, that's exactly how we did it. The challenge is to continue that momentum and continue to do things differently."

Infrastructure

Shovel-ready social infrastructure

Now is the time for Government to invest in our universities as a priority infrastructure project, writes **Michael Barnett**

My tendency is to focus on that muddle of road, rail, port, power, housing and healthcare infrastructure projects Auckland so badly needs and apparently shovel-ready by Government definitions — but not by mine.

It seems to take government agencies a lifetime to get to shovel-ready and then we adopt the confetti sprinkling approach to implementation with many firms and many projects all running in parallel, delivering maximum havoc at minimum pace. We could think differently, combine workforces, have fewer projects on the go at once but complete them quicker and more efficiently and then move on to the next.

I will say no more, but if business trod at that cadenced pace, they would be obsolete, overtaken by a world changing and reinventing at a pace that delivers world firsts.

Shovel-ready must extend to the economic, educational and social infrastructure needed to futureproof Auckland and New Zealand.

Covid's impact has unshackled us and generated a reason to urgently transform our economy to become a globally recognised high value-added, productive, innovative, research driven, tech hub, attracting world class skills and deep pocketed multinationals seeking the best. The question is, will we respond.

To reap the rewards of a high performing knowledge economy, New Zealand needs a critical mass of labour, capital and expertise in the IT, medical, engineering, agritech and manufacturing sectors to build global competitiveness and critical mass.

Implicit is the need for our education system and its curriculum to get with the programme and become agile, and fast at delivering learning and competencies that are applicable and relevant for our social and economic future.

But believe me it will take more than lip service and tweaking the edges of established courses, no matter how well they have served as money machines attracting overseas students for our education sector.

Our first challenge is how quickly can the universities see value in moving away from the belief that "we desperately need foreign students so we can make money" to "New Zealand desperately needs graduates who can engage in medicine, technology automation, coding, robotics, gene treatments and create new ideas and process through research to meet our future business needs".

Now is the time for Government to invest in our universities as a priority shovel-ready infrastructure project. Be strategic and stop competition between campuses and cultivate specialisation and global excellence to attract top talent and top dollar from multi-nationals seeking research partnerships. Just look at the symbiosis between Microsoft and Stanford University.

> From early childhood through to high school, the teaching and learning outcomes need overhauling so we have students with the necessary skills.

From early childhood through to high school, the teaching and learning outcomes also need overhauling so we have students with the necessary skills, especially in engineering, programming and science to think, create and thrive in the digital era.

Universities have a pivotal role in steering our future towards becoming an innovation-led economy that can stretch, flex and grow as opportunities emerge.

Perhaps our universities need to learn from the private sector what speed and agility mean in action and get over their hierarchical and cumbersome operating models.

As a country we have shown we are resilient and adaptable. We need to become more agile and braver at thinking big, thinking global not regional, not parochial, not all about me and thinking how we attract the right multi-national investment and expertise that will support national growth, improve process, productivity, speed and scale.

It will mean working together doing what is best for the country rather than together apart, and pursuing centres of excellence and specialisation — the only clusters we do not want to eliminate!

I am motivated by the work by Koi Tū: The Centre for Informed Futures, a think tank and research centre at the University of Auckland, led by Professor Sir Peter Gluckman, which is identifying the building blocks towards a sustainable economic future.

These big thinkers are advocating educational, industry and urban agglomerations or a hubs and spokes concept. Auckland, as our largest and most internationally positioned city, and only city of any scale, should be the prime knowledge hub with other institutions contributing knowledge and research, complemented by industry-specific clusters located around the country. Essential elements are ensuring affordable housing, education, healthcare, social amenities and welfare and environmental care so quality of life and opportunity, not just incomes, improve.

So, what has to change to make Auckland the coding capital of the world or Tauranga robotic fruit picking international centre of excellence?

New Zealand has a moment in time to capitalise on our current reputation for managing the virus, leadership, stability, cohesiveness, corruption-free status and social and environmental care.

We are attractive to investors and partners and have the capacity to build a diversified, resilient, sustainable digitally attuned economy but we need to get the basics right — our infrastructure: our roadways to learning, our bridges to knowledge, our natural powerhouse — our people and their capacity to innovate, dream and deliver a sustainable future.

● *Michael Barnett is CEO of the Auckland Business Chamber.*

Infrastructure

Building players ride the storm

A new survey shows the construction industry has started taking a more collaborative approach but there are still lingering concerns that ongoing Covid issues may cause further trouble, reports **Graham Skellern**

The construction industry in New Zealand has weathered the Covid-19 storm better than expected but there are continuing concerns over further fall-outs including an increase in disputes, according to a new report from law firm Russell McVeagh.

The *Building Up New Zealand's Construction Industry* report said the operating environment has shifted dramatically. The Government-led Construction Sector Accord was launched in April last year, the impact of Covid is providing challenges, and there are new opportunities, including planned substantial investment in public infrastructure.

Ed Crook, Russell McVeagh's property and construction partner, said a surprising number of respondents considered the Covid fall-out so far was not as severe as expected.

Many were able to progress projects effectively in alert levels 2 and 3 and there was a willingness in the industry to solve problems collaboratively.

But the survey showed more than 60 per cent of the 79 respondents thought disputes are likely to increase over the next two years, and only 11 per cent said they would decrease. However, the number predicting an increase in disputes dropped from the 71 per cent in the last survey and there were only 4 per cent anticipating a decrease.

Crook said there was concern that ongoing Covid issues would likely reduce the amount of work on offer, disrupt supplies, squeeze profit margins and potentially increase disputes.

Nearly 30 per cent of the respondents were concerned about the compression of the market and a reduction in available work; 23 per cent were worried about increased costs and a reduction in cashflow; 30 per cent thought there may be potential disruptions to the supply chain or unavailability of materials.

Crook said many respondents reported the impact to contracts had been minimised by all parties taking an open and collaborative approach to managing issues as they arose, and an understanding from clients that some degree of delay and disruption was simply unavoidable.

Covid-related complexity is also an issue at the time of tendering for new projects and attempting to finalise contracts. One respondent said: "Want to be able to put dates in contracts, but it is a catch-22. How can we set explicit dates if we're unsure whether we will be able to achieve them?"

Crook said the ongoing response to Covid would play a large part in setting the tone in the construction industry and may continue to be a barometer of the early effects of the sector accord.

The biggest dispute was between Fletchers and SkyCity over the cost of the convention centre.

Ed Crook

Michael Taylor

The accord aims to strengthen the partnership and trust between the Government and industry, working together to meet challenges such as skills and labour shortages, unclear regulations, a lack of co-ordinated leadership, an uncertain pipeline of work and a culture of shifting risk.

Russell McVeagh construction disputes specialist Michael Taylor said the jury is still out on whether the accord will change the disputes landscape. While most respondents agreed that the principles underpinning the accord are admirable, many doubted the degree of commitment within the industry to turn those words into action. The accord, however, is an attempt at culture change, and respondents acknowledged that this takes time.

"Encouragingly, the collaborative approaches to some of the challenges posed by Covid do suggest positive change may be beginning to take hold in some quarters," he said.

Half of the respondents considered the accord and its principles were likely to reduce further disputes. Broken down further, 48 per cent of principals and employers, 45 per cent of contractors and sub-contractors, and 33 per cent of engineers to contracts thought the accord would reduce disputes.

One respondent said: "Until there is a genuine shift in leadership of best practices, the current power imbalance will continue to put pressure on the industry." Another said: "One thing missing from the accord is that a contractor should be entitled to make a fair profit. With Covid-19, when work is getting more scarce and pricing tighter and more aggressive, the ideals are unlikely to represent reality."

The report concluded that over the past two years little has changed in terms of project delays and construction disputes — with employer variations and poor quality documentation being the key drivers.

Issues with standard form contracts used in the industry, and the complications of multiple tailored or bespoke contractual clauses were seen as creating unwarranted complexity and increasing the risk of parties not understanding what they were agreeing to.

Interestingly, few respondents considered issues relating to insolvency were a key cause of project delay. Despite the challenges of Covid, but with the support of the wage subsidy, formal insolvency appointments in New Zealand this year have so far been at relatively low levels, the report said.

> Despite the challenges of Covid, but with the support of the wage subsidy, formal insolvency appointments in New Zealand in this year have so far been at relatively low levels.
>
> Building Up New Zealand's Construction Industry report

Nearly 30 per cent of respondents identified poor quality documentation as the cause for disputes, 20 per cent cited delays in work and extensions of time, and 19 per cent mentioned issues with quality or inexperience, though when broken down the number increased to 23 per cent of engineers to the contract.

Other causes of disputes were: slow payment, financial strain or solvency (19 per cent of all respondents backed this); unfair risk allocation (9 per cent and 14 per cent of contractors); underpricing at tendering (14 per cent and 18 per cent of principals); variations (13 per cent of all respondents); and co-ordination and communication (9 per cent).

A project manager said: "It is inevitable and good business to push the risk down the contract chain. Do not expect risk allocation to become more fair or equal."

One contractor said the unfair risk allocation posed fewer problems when times were good. With plenty of work on offer, contractors could afford to be more selective in the contracts they choose to pursue.

The report said the next two years could be a "make or break" for the integration of the principles set out in the sector accord.

Taylor said with infrastructure and construction central to stimulating New Zealand's economic recovery from Covid, contracts for major projects are a particularly high-stakes environment.

"They are frequently for works of high value, undertaken over a long term and in a dynamic environment where many unknown events may be encountered. It is essential that everyone involved in the contract understands it," Taylor said.

Infrastructure

The winds of change: measuring what matters

Now more than ever, we need our infrastructure projects and assets to be a vehicle for good, writes **Adrienne Miller**

The time for sustainable big picture ecosystem thinking is now. Post-Covid recovery programmes need to be structured to address wider impacts than just economics and job creation. The "building back better" everyone talks about should involve "building back" from a new, much more aspirational, model, not be about reinstating the old system and ways of thinking.

Incrementalism will not do. The scale of the investment required for economic recovery means if we don't take the chance to do something bold now, the opportunity may be lost. Post-Covid we have this pincher movement of rising public awareness around the urgency required to address climate change and resilience, and a social licence and regulatory landscape that is rapidly changing. Consumers and employees are more attuned to the nuances of organisational action. They will select and deselect on the basis of purpose and authenticity.

Investors are alive to this, the risks of redundant assets and the call to properly value what have traditionally been regarded as externalities (the negative costs to society of an organisation's activity) — a clarion call answered with the Task Force on Climate-related Financial Disclosures (TCFD-like) requirements recently imposed on financial institutions.

Coupled with the clear articulation of risks in the National Climate Change Risk Assessment, New Zealand directors now have quite a different risk profile to consider.

It's no different in infrastructure. There are winds of change at play. For a long time what we celebrated was the asset itself and the amazing engineering and technical competency that delivered it. Then we started to realise the asset could do more than be, it could be an enabler for people and communities and their aspirations and maybe even designed to create wider good. Now more than ever, we need our Infrastructure projects and assets to be that vehicle for good.

Successful organisations will be those that seize this opportunity and deliver prosperity and better outcomes for people and planet.

On Friday 18 September, when the news cycle was dominated by the crash on the Auckland Harbour Bridge caused by an unprecedented (possibly climate-change related) wind gust, another event of some significance to the infrastructure landscape was announced that went largely unreported at the time.

It was the announcement by Waka Kotahi NZ Transport Agency that they would be to partnering with the Infrastructure Sustainability Council of Australia(ISCA) to deliver sustainable outcomes across land transport infrastructure. That policy change and it's decision to use the IS Rating Scheme for capital projects over $15m is aligned with Waka Kotahi's April 2020 sustainability action plan, Toitū Te Taia, which sets out their vision for a low carbon, safe and healthy land transport system.

The ISCA rating tool assesses all aspects of sustainability including governance, environmental, social and economic outcomes, and also drives innovation.

The rate of return on investment is not to be sniffed at either. In fact, analysis confirms that over the life of the asset, IS projects deliver up to $2.40 for every dollar spent.

The scheme has not gone unnoticed internationally. A research paper by Stanford University concluded that ISCA's IS Rating Scheme had the most rigorous and comprehensive assessment process, relative to other global sustainability rating standards assessed.

So who is ISCA?

It's a member-based, not-for-profit operating across Australia and Aotearoa New Zealand whose purpose is enabling sustainability outcomes in infrastructure. It is also an industry collaboration success story.

Founded in 2007 as a result of a collaboration between 19 founding industry organisations, the ISCA of today emerged in 2012, In September 2017, ISCA launched the IS Rating tool. The tool was developed by ISCA and its members or, as we like to say, "by industry, for industry".

> The 'building back better' everyone talks about should involve 'building back' from a new, much more aspirational, model.

ISCA's membership is a who's who of the sector, including most tier 1 engineering and contracting firms and a number of significant procurers and supply chain partners, all contributing to better outcomes. This committed "community of contribution" across the membership ranks is one of ISCA's strengths.

So what's the take up?

In Australia there has been widespread mandating of the scheme by public procurers, particularly in the roading sector. Unlike its Waka Kotahi predecessor, the IS rating can be applied to all asset classes (not just roads) and right across the life cycle of the asset.

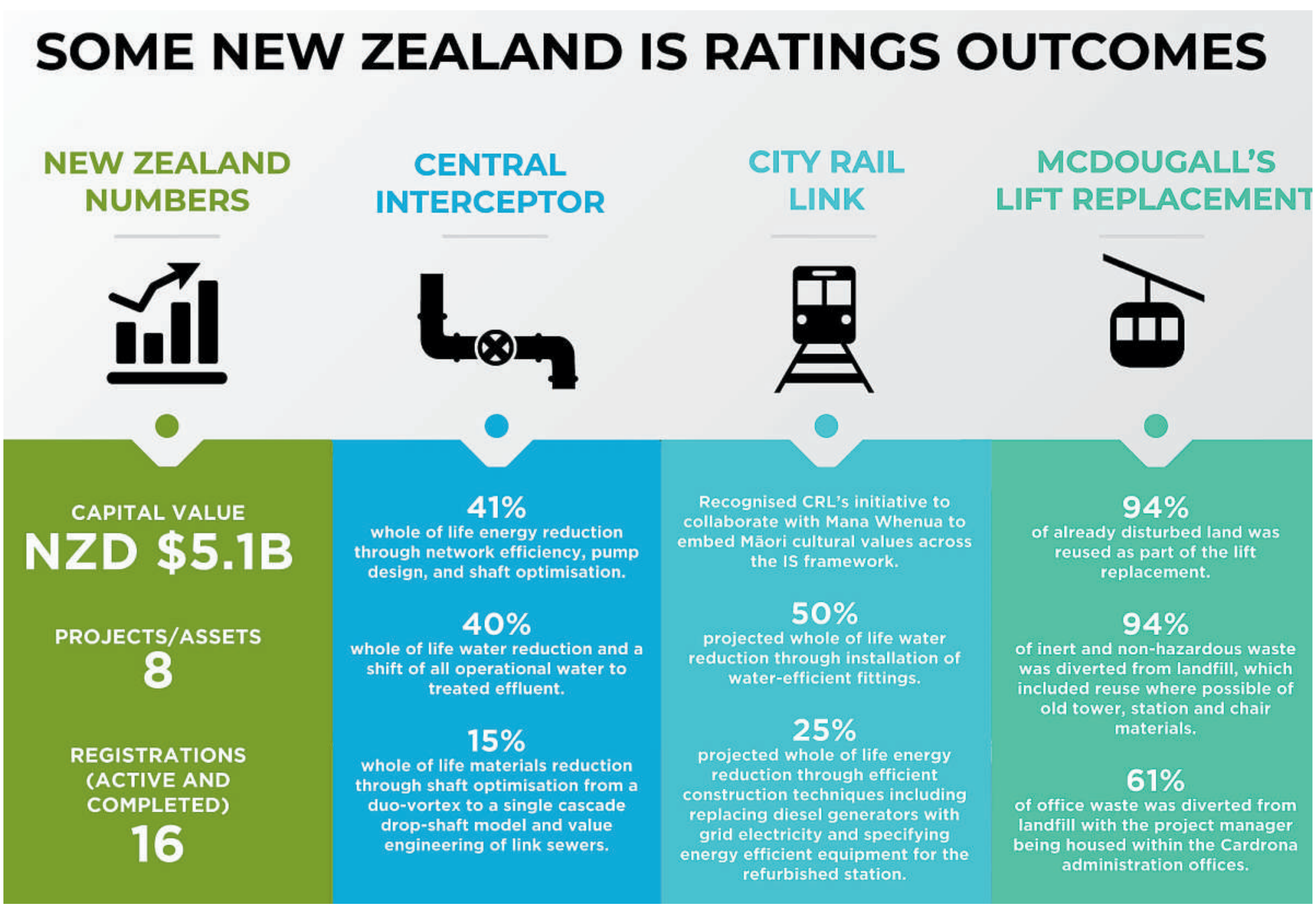
Here its been used on well-known projects like the Central Interceptor and the City Rail Link as well as lesser-known projects at Scotts Point, the Wynyard Quarter and Cardrona. Pace is now starting to pick up. Te Ahu a Turanga (the Manawatu Tararua Highway) and the AMETI Eastern Busway project will be IS Rated. Kiwirail will also use IS on their iReX – Interislander terminals – upgrade. Ports of Auckland has also just kicked off an IS Rating on its operations. Auckland International Airport earlier rated airside operations work.

Across Australia and New Zealand projects with a capital value in excess of $165 billion have undergone rating.

Recently released statistics, confirm aggregate results to June 2020 of a staggering 68 per cent reduction in energy use, 34 per cent reduction in water use and 11 per cent reduction in materials use against declared baselines for As Built ratings, let alone social outcomes. Avoided emissions total 56.3mtCO2e.

It's worth measuring what matters.

● *Adrienne Miller is General Manager NZ for the Infrastructure Sustainability Council of Australia (ISCA).*



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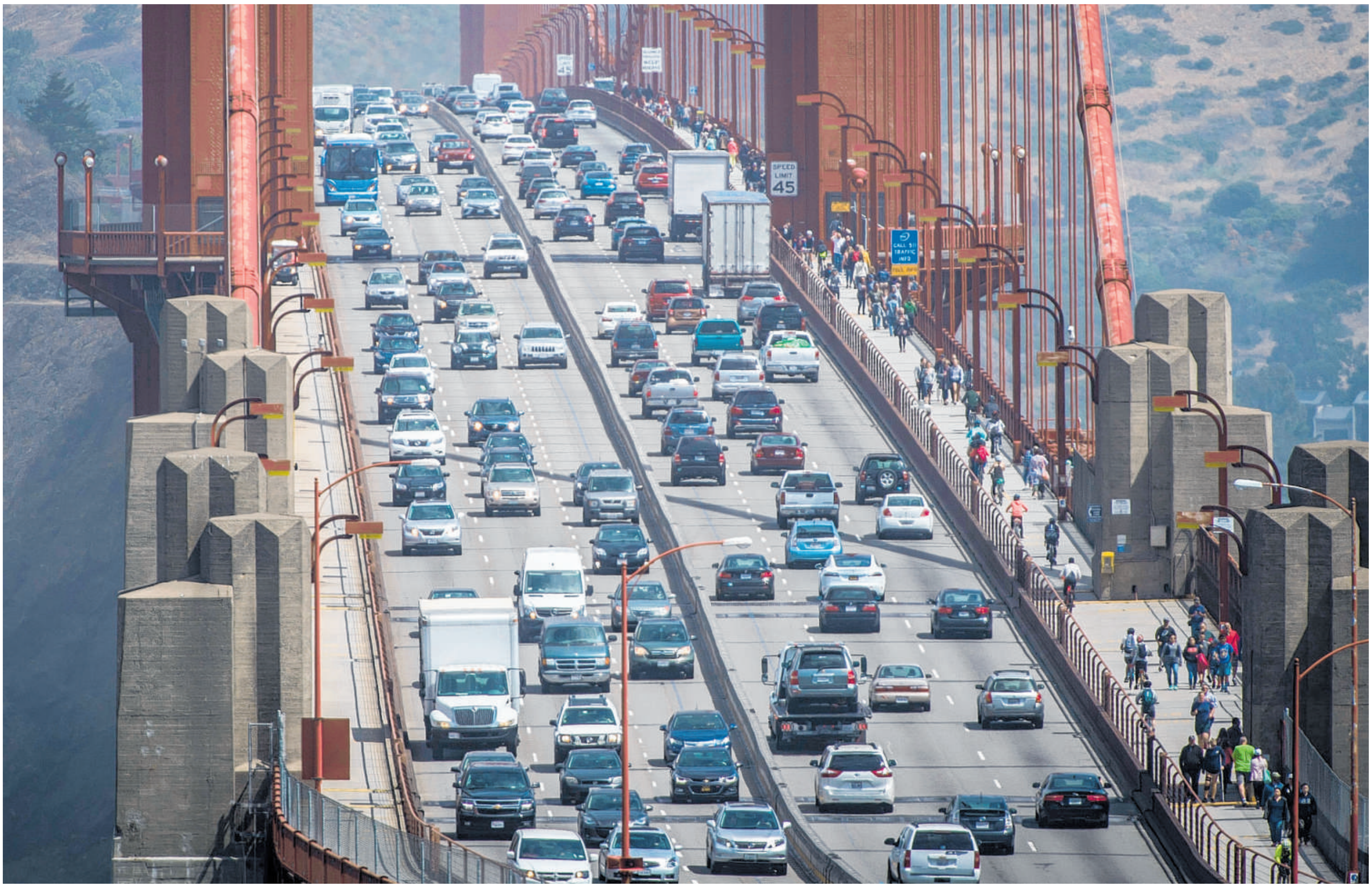

Smart concrete could pave the way

Is this a high-tech solution for America's deteriorating highways, ask **Luna Lu** and **Vishal Saravade**

Every day, Americans travel on roads, bridges and highways without considering the safety or reliability of these structures. Yet much of the transportation infrastructure in the US is outdated, deteriorating and badly in need of repair.

Of the 614,387 bridges in the US, for example, 39 per cent are older than their designed lifetimes, while nearly 10 per cent are structurally deficient, meaning they could begin to break down faster or, worse, be vulnerable to catastrophic failure.

The cost to repair and improve nationwide transportation infrastructure ranges from nearly US$190 billion to almost $1 trillion. Repairing US infrastructure costs individual households, on average, about $3400 every year.

Traffic congestion alone is estimated to cost the average driver $1400 in fuel and time spent commuting, a nationwide tally of more than $160b per year.

I am a professor in the Lyles School of Civil Engineering and the director of the Center for Intelligent Infrastructures at Purdue University. My co-author, Vishal Saravade, is part of my team at the Sustainable Materials and Renewable Technology (Smart) Lab. The Sm Lab researches and develops new technologies to make American infrastructure "intelligent," safer and more cost-effective.

These new systems self-monitor the condition of roads and bridges quickly and accurately and can, sometimes, even repair themselves.

Smart, self-healing concrete

Infrastructure — bridges, highways, pavement — deteriorates over time with continuous use.

The life of structures could be extended, however, if damages were monitored in real-time and fixed early on. In the northern US, for example, freeze-thaw cycles in winter cause water to seep into the pavement where it freezes, expands and enlarges cracks, which can cause significant damage. If left unrepaired, this damage may propagate and break down pavements and bridges.

Such damage can be identified and repaired autonomously.

At an early stage of a crack, for example, self-healing pavement would activate super absorbent polymers to absorb water and produce concrete-like material that fills in the crack. Cracks as small as a few microns could be healed to prevent significant damage by preventing or delaying the later stages of the freeze-thaw cycle.

Top: The Golden Gate Bridge in San Francisco averages more than 100,000 vehicles daily. Above Sensors are installed on Indiana interstate I-74.

Photos /Getty Images, Erin Easterling/Purdue University

The astonishing properties of absorbent polymers.

Many researchers in the world are working on improving construction infrastructure. Technologies recently being explored include solar and energy-harvesting roads, charging lanes for electric vehicles, smart streetlights and reducing carbon-related emissions from construction materials.

> Of the 614,387 bridges in the US . . . nearly 10 per cent are structurally deficient, meaning they could begin to break down faster or, worse, be vulnerable to catastrophic failure.

At the Purdue SMART Lab, our team is also testing novel sensors that monitor transportation infrastructure by embedding them in several Indiana interstate highways. We plan to expand to other state highway systems in the next few years with a goal to better accommodate increased traffic and provide accurate estimates of road conditions during construction and its life.

Sensors embedded in concrete pavement acquire information about the infrastructure's health condition in real-time and communicate the data to computers. Electrical signals are applied through the sensors. Concrete's vibrations are converted into electrical signals that are read and analyzed by lab-built customised software. This enables transportation engineers to make effective and data-driven decisions from opening roads to traffic and to proactively identifying issues that cause damage or deterioration.

After concrete is poured for highway pavement, for example, it takes hours to cure and become strong enough to open for traffic.

The timing of when to open a highway depends on when the concrete mix is cured. If a roadway opens too early and the concrete is undercured, it can reduce the life expectancy of the pavement and increase maintenance costs. Waiting too long to open a road can result in traffic delays, congestion and increased safety risks for construction workers and commuters. Curing concrete for massive highway projects requires close attention by engineers in conjunction with the weather specific to that region.

Smart sensors embedded in concrete enable engineers to monitor the infrastructure and make data-driven decisions about when a road can open while retaining maximum life expectancy. Sensors can also help monitor the quality of concrete and whether it is robust enough to withstand traffic flow and corrosion after a roadway is opened. Smart, efficient infrastructure can significantly reduce structural failures, both catastrophic and through normal wear, as well as lead to reduced costs and provide new ways for structural engineers to assess real-time information about the pavement.

Saving time and money

Congress recognises the need to invest in American transportation systems. A US$494b legislation package, the Invest in America Act, was recently introduced to address America's deteriorating highways and bridges while diminishing carbon pollution.

Smart sensors and intelligent infrastructure system can enable significant savings of time and money with improved construction safety. Sensors can provide engineers with real-time data of the quality of our infrastructure to make the best decisions for building and maintaining roads, bridges and pavements while improving safety for drivers and construction workers. The addition of self-repairing properties can help build sustainable and long-lasting infrastructure to reduce maintenance and costs.

● *Luna Lu is Professor Of Civil Engineering at Purdue University and Vishal Saravade is a Post-doctoral Scientist.*

They receive funding from Indiana Department of Transportation.

Local Government Minister Nanaia Mahuta will deliver a keynote speech at the infrastructure symposium

Excitement is building . . .

Images from last year's infrastructure symposium.

Local Government Minister Nanaia Mahuta will deliver a keynote speech at Rebuilding Nations today charting progress on the major water reforms she has been leading.

Infrastructure NZ's annual symposium attracts all the key players in the infrastructure space.

Building Nations recently won Best Corporate Event Award at the New Zealand Event Association Awards.

More than 105 entries were received for the highly coveted awards.

Infrastructure NZ chair Andrew Stevens said the award was testament to the efforts of the team.

"It's hard to believe how far we have come, from our very first Building Nations Symposium at Villa Maria in 2006 with a mere 40 delegates, to the premier event on the infrastructure calendar that attracts so many delegates only a handful of venues in the country can accommodate us."

The Covid-19 pandemic means many will mask up for the two-day event.

Infrastructure

A tale of three cities

An ambitious urban project for Sydney's west will be part of its economic recovery, writes **Bill Bennett**

Sarah Hill is building a new city the size of Auckland in Sydney's west. At its heart will be a new international airport and the Western Sydney Aerotropolis, a development designed to capitalise on the economic potential of the airport.

Hill is the chief executive officer of the Western Parkland City Authority. She says the new city will be substantial in scale. In time it will be home to 1.5 million people, but there are bigger ambitions for the project than housing.

"Western Parkland City will be part of our economic recovery and will play an important role in supporting our future growth industries in Australia," she says. "It will be the most green, the most connected and the most advanced city in the Southern Hemisphere."

Hill was a natural choice to head the project. She comes from a town planning background. More recently she was the first CEO of the Greater Sydney Commission. This was set up to take a collaborate cross-government approach to planning for development, transport and housing through the entire Greater Sydney area. The goal is to grow, while keeping the region productive, liveable and sustainable. It had to come up with a new strategy for the city.

"We recognised that we really had a tale of three cities," Hill says.

"We realised quickly that there's a smashed avocado line where there is social inequity across the region. It shows up in Western Sydney where a lot of people live because it has more affordable housing. But they have to commute into the eastern harbour city and the CBD to work. People are travelling for over an hour each day.

"We knew we had to do something to rebalance the city. A lot of the international research points to taking a polycentric approach to city planning. So we developed a strategy working with our citizens around three cities which collectively make up Greater Sydney".

To the east is the harbour city, there's a central river city around Paramatta and Western Parkland City which is 100,000 hectares of urban land within 700,000 hectares of national park. There are cow paddocks, but there are also 200-year-old town centres.

"One idea behind the three cities model is that people need to work within 30 minutes of their home," she says. "There's an enormous disparity in jobs in Sydney, many people from the west travel to the east in the morning and home to the west in the evening. Which meant we knew we had to generate more jobs and better quality education facilities in the Western Parkland City."

This page and facing page: The CSIRO facility that will be built in the Western Parklands City Aerotropolis.

To get this moving, the Greater Sydney Commission negotiated the Western Sydney City Deal. This is a 20-year agreement to deliver a set of infrastructure and other investments into the area, it includes creating employment opportunities. The deal was signed by the Australian prime minister, the NSW premier and eight Western Sydney mayors.

Hill says it's not a new concept, there are similar deals in the UK and Canada. The important thing is that it ties in the Australian government, the state government and local government. It's a complex agreement with 38 commitments to matters such as improving liveability, funding for parks, aboriginal employment and a north-south metro line that links to the existing Sydney rail network. This will include connections to the new airport and the Aerotropolis. Part of the city deal was to help drive job generation through investment attraction, improving schools and infrastructure.

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Infrastructure

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There are questions about supply chains and the diversity of jobs.

Each of Sydney's three cities will have its own economic and employment focus. Western Parkland City will concentrate on advanced manufacturing, aerospace, defence and research along with the skills, education and training needed to address those areas.

"We're trying to achieve the most, most green, the most connected and the most advanced city in the southern hemisphere. Green relates to the environmental aspects, you can't build a city in park land unless you're green and sustainable. That also means a green economy."

On average Western Sydney is seven degrees hotter than its eastern part. To mitigate against this, the new city is working to increase the tree canopy. At present the canopy is at about 18 per cent of the area, there's a target of increasing this to 40 per cent, which will help cool the city.

It is also working to recycle water. Hill says: "We can't just build more pipes to the ocean for sewage to be discharged. We need a more integrated approach to water management and we need to be innovative in terms of utilities. We've got wires and pipes and corridors everywhere. We're innovating a multi-utility approach potentially there's a 30 to 40 kilometre tunnel across our city to service it all. You can drive a car through the tunnel, after its done we'll put a park on top."

"We're connected because we've got a 24-7 airport. This was a huge driver of the city deal. We've got new metros that are co-funded by the Commonwealth and state government. There are new roads, we have freight, and we're doing a lot in the digital funding space. So we want to be connected from a digital point of view, and better connected from a community point of view.

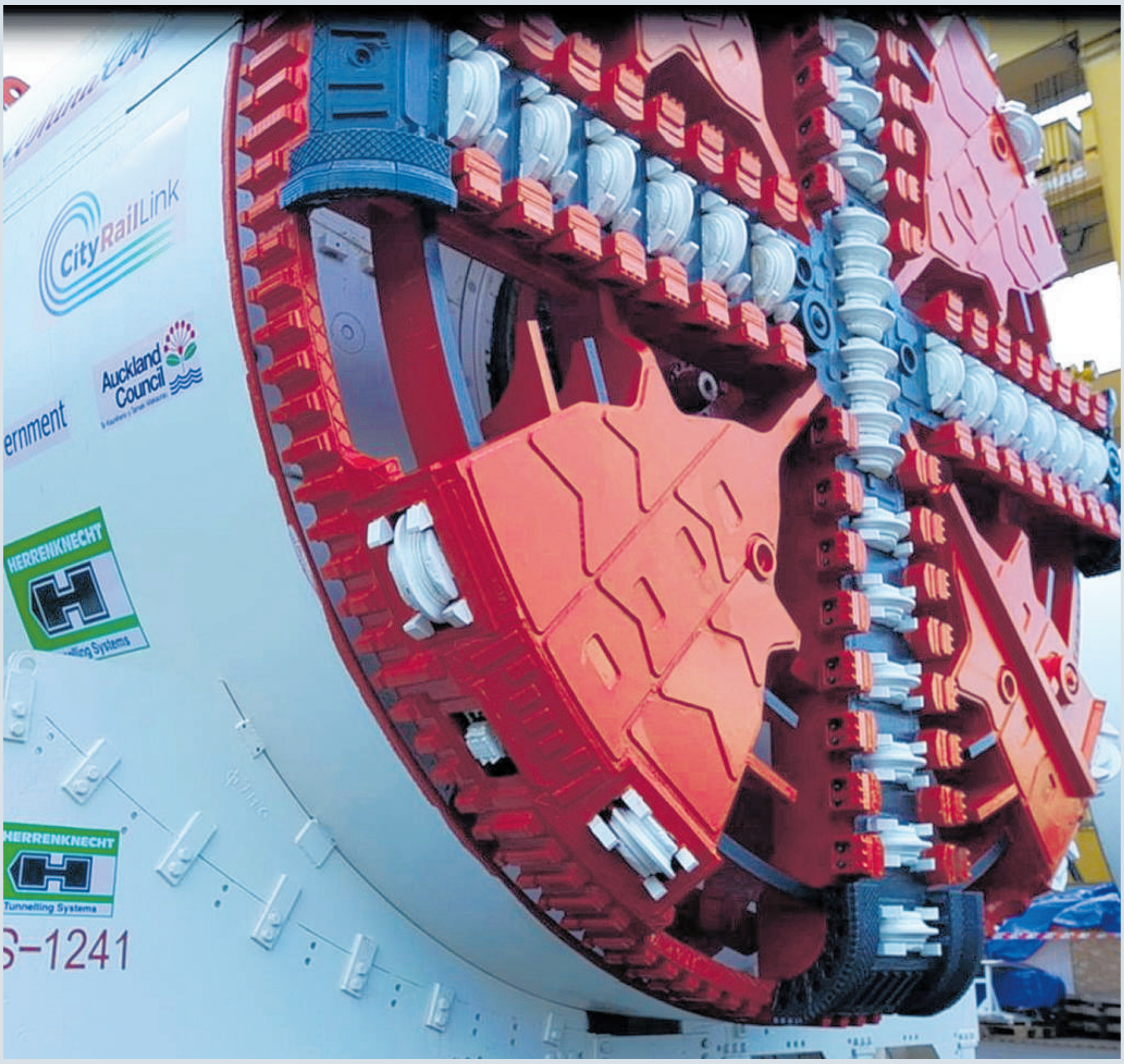
"Advanced manufacturing is a huge platform here in Australia. The Commonwealth government has a strong strategy around modern manufacturing, but we're also advanced in terms of cybersecurity skills and in education and training where we give advanced skills for our citizens."

We're trying to achieve the most, most green, the most connected and the most advanced city in the southern hemisphere.

Sarah Hill

A short way from the new airport, Western Parklands City has a site where it is creating the new Aerotropolis. This will be the centre of activity for education skills and training, along with space and defence industries. It will include an agribusiness precinct and pharmaceutical manufacturing. There are already anchor tenants. Hill says 18 international partners who've signed up to work with the city on developing this area.

Infrastructure



Aucklanders' chance for a 'Boring Day Out'


Francois Dudouit

Aucklanders will next month get the chance to meet in person, Dame Whina Cooper, the giant tunnel boring machine that is heading underground to complete construction of the two City Rail Link tunnels.

Auckland's "Boring Day Out" will be held at City Rail Link's Mt Eden construction site on Sunday, December 6.

The boring machine is named after the revered Māori rights activist and people will be able to see it close-up, as well as see where it will start its underground journey next year from Mount Eden to the Karangahape underground station then on to the Aotea station in central Auckland.

"This will be a rare opportunity to see the star of New Zealand's biggest-ever transport infrastructure project before it disappears underground," said Francois Dudouit, Project Director for the Link Alliance which is constructing the City Rail Link.

"This project has always been for Auckland and the 'Boring Day Out' is one way we can say thank you to Aucklanders for the support we get, as well as demonstrate state-of-the-art technology that will reshape the way we travel in this beautiful city".

The machine arrived in Auckland in parts from China and is being reassembled on site. Its front section, known as the cutter head, will be on display. "As it crunches its way underground, it is the cutter head that does most of the heavy excavation," said Dudouit.

Event information:

- There will be 10 visiting sessions on December 6. The first entry is at 9am and the final one at 6pm. Visitor numbers will be restricted to 500 for each session.
- Tickets are free; people can book up to five per person.
- Plan the trip online using Auckland Transport's Journey Planner at www.at.govt.nz.