November 2020 #103

SURVEYING +SPATIAL

Magazine

Managing NZ's Soaring Housing Market

GIS Mapping Tools for Māori Communities

Boundary Wall or Wrongly Placed Structure? – Case Law Conundrum

Smart Routing Technology for business

WHEN BRAND MATTERS

Renting survey and spatial gear is easier than you think from AllTerra and all equipment is available for either short or long-term rentals.

The range features the latest equipment from **Trimble**, including:

- Robotic Total Stations
- GNSS/GPS Systems
- Scanners
- Data Collectors

Take advantage of our rental programs - you'll get what you need to get the job done right while experiencing the benefits of the newest state-of-the-art technology.

Whether you need equipment for a project, or for a service replacement to minimise downtime, we have the solution for you.

Trimble
Authorised Distribution Partner

ALLTERRA™

P: 0800 ALLTERRA

A Spring Refresh for *Surveying+Spatial*

Rachel Harris

Over the last few months Survey and Spatial MNZ has been working on a number of changes to the look and feel of its communication channels, and you may have noticed that this *Surveying+Spatial* September edition is looking a little different with some revitalised changes to the design.

Our team have enjoyed updating the look of the magazine this quarter and we hope that the changes brought to you this edition and going forward will continue to provide our readers with an appealing, contemporary and informative publication.

This year has brought about many unpredictable changes and uncertainty, but interestingly, a buoyant New Zealand housing market has defied many dire expectations with strong demand and soaring house prices featuring prominently in the news over the last few months.

There have been many notable examples of increasing regional house and land prices around the country. Certainly, increased demand and inadequate supply have been at the heart of this surge, but in post-lockdown New Zealand, new factors have come into play including more flexible remote working arrangements, returning ex-pats, increasing numbers of retirees, low interest rates and many people re-evaluating their lifestyle options.

As a Cantabrian, I have been keenly observing the market in our region and those across the South Island, many of which have been seeing record highs.

An interesting example of this has been the West Coast, where demand and real estate prices had been flat for several years following the decline of the mining sector but recently has seen a marked increase in property sales over the past few months.

Radio New Zealand News recently reported a big increase in real estate sales for the region, with the Coast seeing the country's highest increase in regional house sales for the month of July this year.

Figures from the Real Estate Institute of New Zealand show a 57 percent increase in sales was the West Coast's largest rise in 14 years.

A popular holiday and recreational area, the West Coast is now also becoming a popular residential lifestyle location. The region is a big drawcard for outdoor enthusiasts but other factors including affordable housing, a new hospital and a relaxed lifestyle are luring buyers from further afield to live on the Coast.

An increase in residential consents, new-builds, and the imminent provincial growth fund and 'shovel-ready' projects are also helping draw contractors and workers to the region.

Regional growth may continue for some time yet, as many city dwellers, retirees and first home buyers look to resettle in more affordable and lifestyle-orientated areas.

In this edition we feature a timely and thought-provoking article from Andrew Blackman on managing the housing market in New Zealand. With a recession now underway and a heated property market in full swing, the challenges of the market are discussed with a cautionary tale that without support and initiatives to ensure construction continues at pace, the market may become significantly unstable.

Continuing our property theme, S+SNZ CEO Ashley Church considers whether urban growth boundaries are helping or hindering land prices in the Auckland region.

From LINZ, Duane Wilkins looks at GIS mapping tools for Māori groups and how these can assist Māori increase their access and use of geospatial information, gather information about the landscape, natural resources and connections with the land.

Stuart Caie presents a report on the collaboration between LINZ and Maritime NZ on the new edition of the *Good Practice Guidelines for Hydrographic Surveys in New Zealand Ports and Harbours*, and determining boundary walls versus wrongly placed structures is examined in this edition's Case Law Commentary. •

With a number of disruptions to our survey and spatial community due to COVID-19 this year, S+S magazine will be taking a break through December and will continue with our 2021 editions in March. If you'd like to contribute to our March edition, email: *surveyingspatial@gmail.com*

Contents

NOVEMBER 2020

SURVEYING+SPATIAL
ISSUE 103 NOVEMBER 2020

A publication of Survey and Spatial New Zealand, Tātai Whenua.
ISSN 2382-1604
www.surveyspatialnz.org

EDITOR
Rachel Harris
surveyingspatial@gmail.com

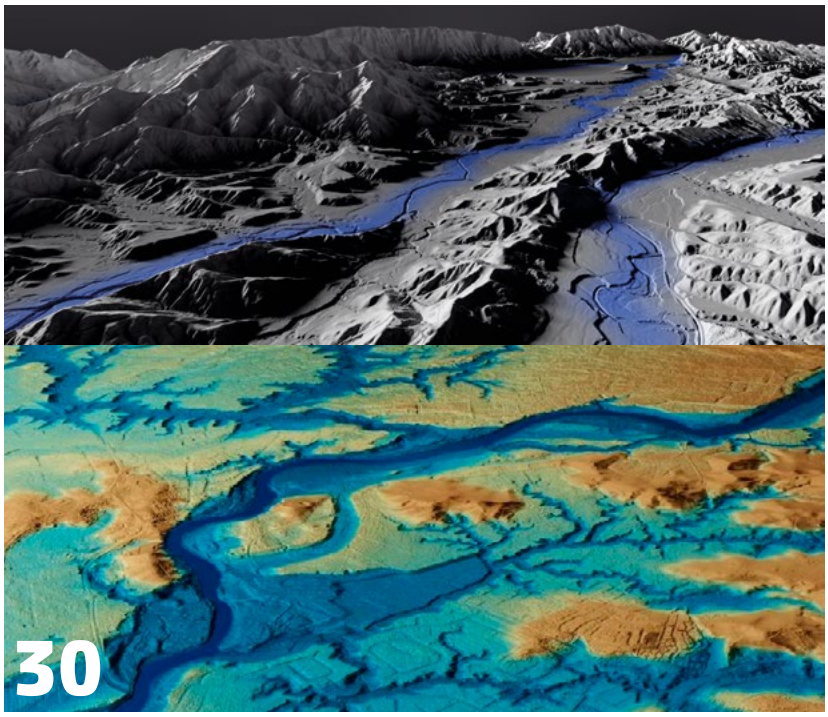
Correspondence relating to literary items in *Surveying+Spatial* may be addressed to the editor. Papers, articles and letters to the editor, suitable for publication, are welcome. Papers published in *Surveying+Spatial* are not refereed. All correspondence relating to business aspects, including subscriptions, should be addressed to:

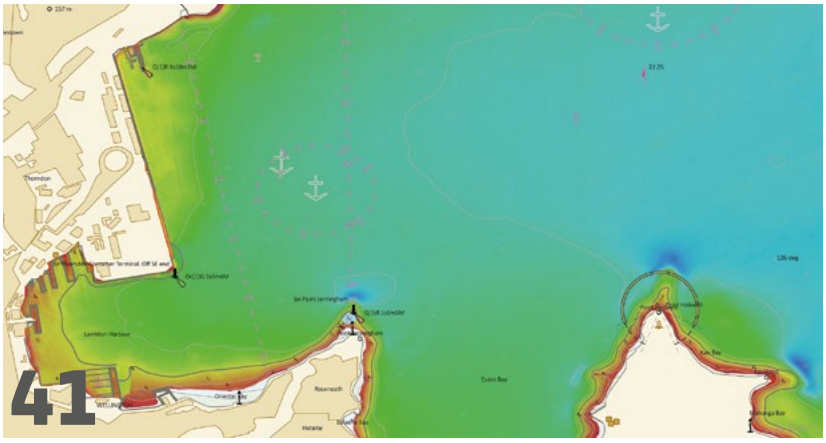
The Chief Executive
Survey and Spatial New Zealand
PO Box 5304
Lambton Quay
Wellington 6140
New Zealand
Phone: 04 471 1774
Fax: 04 471 1907
Web address:
www.surveyspatialnz.org
Email: *admin@surveyspatialnz.org*

Distributed free to members of S+SNZ. Published in March, June, September and December by S+SNZ.

DESIGN & PRINT MANAGEMENT
KPMDesign – *www.kpmdesign.co.nz*
info@kpm.co.nz

TO ADVERTISE
Email: *admin@surveyspatialnz.org*
or contact Jan Lawrence
+64 4 471 1774





Ending Boom and Bust

Why the NZ Property Market must be managed

ANDREW BLACKMAN

While writing this, we are now at Level 3 in our second Covid-19 lockdown in Auckland and focus has turned back to the health requirement of eliminating the virus from our shores. However, as we move forward in a hopefully Covid-19 free New Zealand, our attention will again turn towards the economic consequences and the measures required to lessen the impact on the country.

As a nation, one of our greatest costs is housing and there has been much written about how overpriced New Zealand houses have become. In recent years, much effort has gone into increasing housing supply in an attempt to keep prices under control. In addition, other policies have been introduced to start to manage the property market. These have included controls on lending, such as loan to value ratios (LVR restrictions), restricting overseas buyers, controlling interest rates, and even limiting immigration.

Blame has also been directed at legislation such as the Resource Management Act and the constraints that it causes.

In writing this, it is the opinion of the author that further intervention in the property market is required to even out its excesses. When there have been long periods of relative stability, the market tends to find an equilibrium, so supply and demand are reasonably evenly matched. However, when there are major upheavals in the economy such as the one caused by the global financial crisis (GFC), the natural forces in the property market are not particularly effective.

Impact of the GFC on housing numbers

In February 2018, an independent report commissioned by the New Zealand Government and entitled *A Stocktake of New Zealand's Housing* was released. The report contains data on the number of dwellings that were consented over the preceding couple of decades. While the GFC affected these throughout the country, the changes were particularly extreme in Auckland.

The report states: "The current shortfall of housing in Auckland is estimated to be at around 28,000 dwellings over the past decade,

. . . compared with the 11-year pre-GFC average of 9304, there was a 45 per cent reduction in the consenting of new houses [in Auckland] over an eight-year period from 2008 to 2015, during which the average was only 5093.

although other estimates put this deficit at 45,000 units."

Table 1 (next page) uses data from the report to further consider the impact of the GFC on the creation of new houses in Auckland. It shows that compared with the 11-year pre-GFC average of 9304, there was a 45 per cent reduction in the consenting of new houses over an eight-year period from 2008 to 2015, during which the average was only 5093. This contraction was at its greatest in the four-year period from 2009 to 2012, when the average was only 3615.

This is a reduction in the number of consents of 61 per cent, when compared with pre-GFC levels. Over the eight-year period, the reduction in the number of consented dwellings was more than 33,000. The close correlation with the size of the estimated shortfall provides some fairly obvious evidence of the source of the problem.

Impact of the GFC on the capacity of the property sector

In 2008, American sub-prime mortgage defaults led to the GFC, which caused a recession in New Zealand. This led to a slump in property prices, followed by a fairly flat period lasting until about 2012. Over this period, many property developers reduced their exposure to the market, by significantly reducing the number of new sections and new houses that they created.

This led to a significant contraction of the workforce in the entire property sector, including builders and other tradespersons, and also professionals such as engineers, surveyors and planners.

With the reduction in workload, previously profitable companies found themselves desperately trying to survive. Inevitably, this resulted in most professional services firms making staff redundant, with some losing up to half of their workforce, or more.

After losing their jobs, many in the sector went overseas to Australia and other places seeking employment. Graduating students found that employment opportunities in New Zealand were extremely limited and many of them also went overseas. As a result of the poor employment prospects, universities reported low intakes of students for a number of

Table One : The Reduction in the Number of Consents for New Dwellings in Auckland Due to the Global Financial Crisis

Year to June	Event	New Dwelling Consents	Average 1997 to 2007	Diff from Average	Diff as a Percent	Shortfall below Average
1997		8451		-853	-9	
1998		9259		-45	0	
1999		9209		-95	-1	
2000		9965		661	7	
2001		7407		-1897	-20	
2002		9374	9304	70	1	
2003		12277		2973	32	
2004		12937		3633	39	
2005		9435		131	1	
2006		7250		-2054	-22	
2007		6781		-2523	-27	
2008	GFC	5769		-3535	-38	
2009		3212		-6092	-65	
2010		3656		-5648	-61	
2011		3394		-5910	-64	-33688
2012		4197		-5107	-55	
2013		5343		-3961	-43	
2014		6873		-2431	-26	
2015		8300		-1004	-11	
2016		9651		347	4	
2017		10364		1060	11	

Note: Dwelling numbers from Table 17 in "A Stocktake of New Zealand's Housing - Feb 2018"

years. This all resulted in a significant reduction in the capacity of the sector.

After the earthquakes, the Christchurch rebuild started an expansion in the construction sector. Gradually, the level of construction activity increased and, fairly quickly, companies were reporting skills gaps and a shortage of available professionals and tradespersons. Because of this, the level of construction activity did not keep pace with the increase in the population, particularly in high-growth areas like Auckland.

Coming from such low levels, it took four or five more years for the sector to recover to the point where the production of houses was starting to come close to the number required annually.

The result of the shortfall

It is well documented that a lack of supply led to massive inflation in house prices, particularly in Auckland. This removed the possibility of home ownership for many and led to terms like 'Generation Rent' being used in the media. Rising house prices put upward pressure on rents, which have increased rapidly over the past few years.

The resulting cost of housing has been described as one of the main drivers behind the creation of poverty at levels that were previously unknown in New Zealand. No longer was it just the unemployed that could be considered poor, but a new category of working poor emerged, as wages and salaries failed to keep up with housing costs. This also led to a huge increase in demand for state houses, as an increasing proportion of New Zealanders could not afford to pay market rent.

While the housing shortage has been severe in Auckland, the effects have been wider. As prices have risen in Auckland, there has been a continuing exodus of cashed-up Aucklanders moving to other parts of the country, where they have found more affordable houses.

However, their entry into these other markets has had an inflationary effect in these regions. As part of this, the commuter zone surrounding Auckland has continued to increase in size and it was reported in 2016 that half of the homes sold in Thames had gone to Auckland commuters. The 'super-commuter' is a well-known phenomenon in large overseas cities, however, it is now occurring more frequently in New Zealand.

While a lack of supply was recognised as the problem, the solution was not easy to address as capacity in the sector took time to build. Typically, professionals require a four-year degree and then a period of suitable work experience until they can become fully productive and eventually professionally qualified. While the Government looked at streamlining the consenting process, the reality was that there were just not enough personnel in the sector to undertake the work. While staff can quickly be made redundant when times are tough, finding qualified and experienced staff to expand the workforce in periods of high demand is much more difficult.

A new challenge

We now face a new recession that has the potential to become far worse than the one created by the GFC. If nothing is done, history will repeat and the property cycle that has done so much damage to the country will again have a profoundly negative effect.

With increasing demand for housing, the Government has announced in the Budget that it will

double its efforts and build 8000 new state houses, however, if the previous destructive cycle is allowed to play out again, many more could be required in a few years' time.

The signs in the property cycle are starting to appear again, such as Fletcher Building making 1000 staff redundant, talk of a possible 5 per cent, 10 per cent or even a 15 per cent drop in house prices and a large reduction in sales volumes.

If property developers are concerned that they will not be able to sell the houses they are building, they will limit production once again. Even if they have council consents, they will delay the start of construction until the market looks more buoyant. What developers require is confidence, simply, confidence in the future of the market!

As history has shown, it is difficult to rapidly build capacity in the sector, however it is much easier to maintain the capacity that is already there. All that is required is for developers to keep on building. They will do this if they believe there is demand for what they are building. What is required is a mechanism, or mechanisms, to maintain demand in the market.

Confidence in the property market is not just about maintaining the value of people's homes, it is about avoiding the destructive cycle of boom and bust which has created a country that many New Zealanders can no longer afford to live in.

Managing the market

The property market must be more actively managed and cannot be left to freely react to the undulating cycles of the economy. While small variations can be tolerated, the wild swings of the past decade or so cannot be permitted to continue. As noted earlier, some management has occurred with recent governments attempting to cool down the market when it has become overheated. However, increased management is required to remove the extremes at both ends of the cycle.

With a new recession, the task is now to support the market and provide incentives to ensure construction continues at appropriate levels to at least match demand and preferably further reduce the previous shortages.

The first task is to maintain a very close watch on the number of subdivision consents and consents for new houses. These are leading indicators and there is anecdotal evidence that the numbers are already starting to drop. Following this, a watch must be kept on the number of houses under construction, to make sure developers are not delaying the start once they have consent.

Then the Government must apply sufficient stimulus to maintain confidence in the market. This is about creating enough demand to maintain the status quo. There are many options available, from lowering interest rates to providing incentives to first-home buyers. Simply, an announcement in one of these areas will have the desired result as it will lift confidence.

Immigration also has a key role to play in managing demand and once our borders are reopened, it must be considered in this context. In the meantime, returning New Zealanders will have a similar effect.

For potential first-time buyers reading the current market, logic says it is a good time to continue saving, while waiting for house prices to reduce. Therefore, this part of the market is particularly ripe for a stimulus package. Perhaps an interest-free loan for first-time buyers, or a shared equity scheme, covering, say, 20 per cent of the purchase price would stimulate interest. Assuming a fairly generous $1 million house price, $2 billion would create an additional 10,000 first-time buyers, which would create significant demand and add confidence to the market.

While there are similar schemes currently available, they are generally small in scale and tightly controlled with income limits that often exclude the people most able to enter the property market. Any buyer will add to the demand and so for this purpose there is no need to limit those that qualify. Providing some form of government-backed mortgage guarantee scheme would improve the uptake by ensuring that anyone involved wouldn't have to worry about their mortgage in the case of redundancy.

The cost of encouraging first-time buyers would only be the interest cost, as the Government's investment could be required to be repaid upon resale of the house, or at a suitable time in the future, perhaps after 10 years.

This is only one possible method of providing a stimulus to maintain confidence in the property market and further methods need to be investigated and introduced as necessary. While methods can be compared and refined, it is important that at this point in the economic cycle, confidence is maintained and the number of houses being built does not significantly reduce below the current level.

History has shown that allowing the property market to freely react to the undulating cycles of the economy has produced a profoundly negative impact on the country. It is therefore vital that moving forward the property market is more actively managed to ensure stability and avoid the boom and bust cycles of the past. ●

Now even stronger, together

It's been nearly a decade since we learnt you weren't getting the cover you needed. So, in 2013, we partnered with Survey and Spatial New Zealand to develop specific, proven cover for your industry. Our knowledge of what you do allowed us to identify the gaps that used to be prevalent in your insurance options.

Since then, we've continued to expand our expertise and offering to every type of business; all while retaining our ability to shift and adjust policies as legislation shifts, regulations change, and new technologies are introduced.

Alongside evolving our knowledge base, we've also evolved our brand so that it better reflects our business and focus on client partnership.

Let's talk about being better protected.

gsi.nz

GSI
Insurance
Partners

Survey and Spatial New Zealand
Diamond Partner

Dealing with Change

Kat Salm

As we enter the last quarter of the 2020, I have been reflecting on how we deal with change. There have undoubtedly been some curveballs this year and more than our fair share of uncertainty, with lockdowns, changed plans, cancelled events, and an imminent election in the mix.

I have had many conversations recently with people who have spent the year in 'crisis mode' – dealing with the immediate issues we are faced with and trying to get our heads around what will happen next week, let alone the next month.

For many, they are busier than ever – working furiously to keep the wheels turning. While this may be sustainable for a short amount of time, the strain is starting to show. With Mental Health Awareness week in September, it was an important reminder that we all need to take some time to look after ourselves and to reach out to our colleagues and friends. If anything, it is now when this is most needed. Be mindful of the pressure that many are experiencing and look after each other.

The inevitable cancellation of the annual conference was understandable but still a disappointment. I really appreciate all the hard work that went into the planning and preparation by the National Technical Committee, the Rotorua/Bay of Plenty Branch, and the National Office Team. I also appreciate the difficult decision that needed to be made to cancel it for 2020. At the same time, it serves as a reminder to me of the importance of our community and how much I value opportunities to connect, in person, with peers.

I, for one, am looking forward to being able to resume these important – and enjoyable – activities and having some 'real' conversations (and a good laugh) again! In the meantime, I am excited about the virtual seminars by some great speakers that have been made available from the original conference programme. There are some interesting and relevant sessions and I'd encourage you to participate if you can.

Speaking of conversations, we have been working to connect more broadly with the wider ecosystem in which we work. We see collaboration as an important part of what we need to do for our future – joining up on key issues to increase the volume of our voices, combining efforts on activities of mutual benefit, and sharing best practice to ensure we are leveraging efficiencies where we can. But still, of course, being loudly and proudly Survey and Spatial NZ!

We have been developing collaborative relationship agreements with SSSI, the Australian Hydrographic Society and NULCA, and have been in discussion with several other relevant organisations which we can hopefully develop great working relationships with as well. These conversations have been a highlight of the year for me, and I look forward to the ongoing alliances that we will share.

I am looking forward to the virtual AGM in November – another first for us. I am also hoping it means that more of you will be able to attend and participate. As we approach this annual milestone, I'd also like to take this opportunity to sincerely thank our volunteers on the Council and Board, in the streams, divisions, branches, committees and working groups. It is their work, above and beyond their 'day jobs', that helps Survey and Spatial NZ and our wider industry thrive. That commitment to furthering our community is admirable and hugely appreciated. Thank you all!

Someone said to me this week that what we do as spatial and survey professionals isn't a 'thing' in isolation – it's the *application* of what we do that has the impact. Remember we are all making a difference to our communities, our country, and globally. That's meaningful, and something to take pride in.

Stay well. Look after yourselves and each other. And remember (as I regularly need to) to take some time to move out of 'busy' and look at the bigger picture.

Aye, there's the RUB!

Do urban growth boundaries hold up land prices?

Ashley Church

Among his proposals to 'fix' the Auckland housing market when he became the Housing Minister in 2017, Phil Twyford talked about removing the 'urban growth boundary' in Auckland as a way to bring down the cost of land.

Auckland isn't the only city to have such a boundary (which is now known as the Rural Urban Boundary – or RUB – in the Auckland Unitary Plan) but it's the city in which the difference

between land prices in urban and non-urban areas is most pronounced. According to property data company Valocity Director of Valuation Innovation, James Wilson, land accounted for 60 percent of the cost of an Auckland property, ten years ago, compared to around 40 percent for the rest of the country – and that figure has headed north since then (excuse the pun). The reason for this – so the theory goes – is the artificial stimulus to prices created by having an arbitrary line which 'limits' growth. Put simply – if there's a finite, or limited, supply of something, it will generally cost more.

The numbers certainly seem to bear this out. Recently, Valocity produced figures which showed the suburbs where the value of the land overwhelmingly outweighs the value of the houses that sit on them – noting that, of the more 1700 New Zealand suburbs examined, there are 43 suburbs where the average value of the land represented 80 percent or more of the total council valuation. All were in Auckland bar one (Wellington's Oriental Bay). Admittedly, none of these suburbs were anywhere near the Auckland RUB – but you could mount an argument to say that they're the result of a 'knock-on' effect from the urban boundary where land prices escalate as you get closer to the CBD. Indeed, it's worth noting that even ten years ago the price of land just inside the Auckland boundary was nearly 10 times higher than land just outside the boundary.

So should we just abolish urban boundaries in the cities and towns where they exist? Would this simple act bring down land prices as Phil Twyford believed it would?

Perhaps – but as with most things, it's not quite as 'simple' as it appears.

Firstly, it's worth noting that enforced urban boundaries – such as the Auckland RUB – actually serve an important practical purpose. They provide certainty around which rural areas should remain rural, over time; they allow infrastructure providers to plan for growth (new roads, pipes and utilities, etc) with a high degree of certainty; and they constrain the environmental impact of urban sprawl. So removing them, altogether, might help to reduce land prices on the fringes – but it would do so at the expense of rural and environmental certainty and would create a nightmare for infrastructure development.

But what about expanding rural boundaries rather than removing them altogether? This would certainly address the issues raised by infrastructure developers but would probably still upset rural communities and environmentalists – both groups seeing any further incursion into rural areas as something to be strongly resisted. It's also worth noting that the price of land, as a percentage of the cost of a housing development, isn't really a big issue in any of the towns and cities with urban growth boundaries, outside Auckland. Not yet, at least.

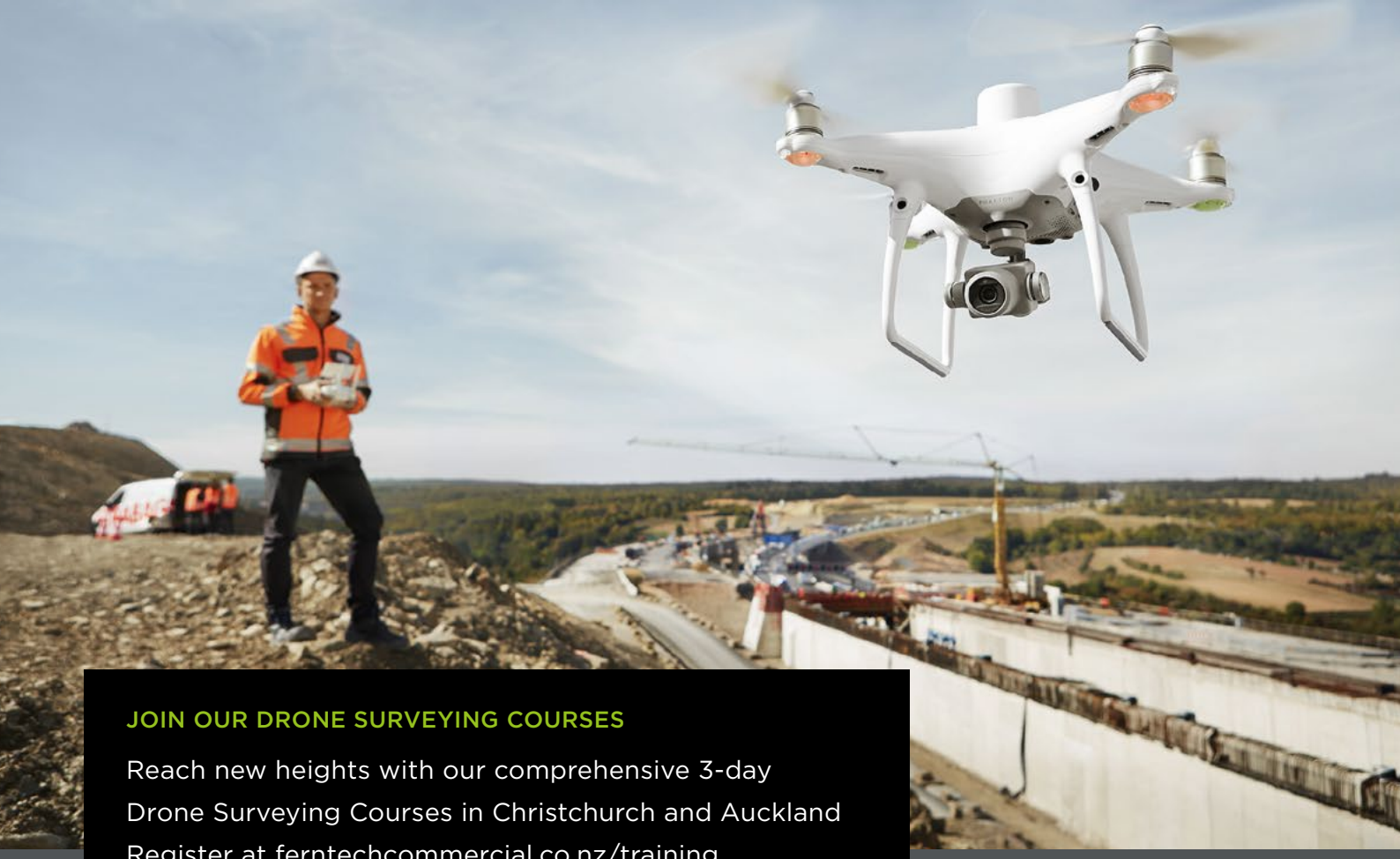
And even in Auckland, where this stuff is an issue, there's a strongly held view that expanding the growth boundary would actually have the opposite effect to that which was intended – and that the land within the newly expanded boundary would quickly increase in value to match that of land within the old boundary.

For me, however, the most compelling argument against any rash decision to remove or expand the Auckland RUB is the reality of just how much land is still available, for development, within the current boundary. Right now, there is still capacity for up to 137,000 additional dwellings in areas within the RUB, as identified in the Unitary Plan – more than enough for our needs over the next 20 years.

For all of these reasons – removing or expanding urban boundaries, in any of our cities, is something which should be done carefully and after extensive consultation – not as the quick-fix equivalent of ripping a plaster off a wound. As with all things housing related, let's hope that common sense, rather than naïve populism, is the order of the day. ●

Transform your operations with the latest in aerial surveying.

Ferntech are your local specialists in aerial surveying technology, providing GCP, PPK and RTK solutions including turnkey photogrammetry and LiDAR, alongside experienced support and training.



JOIN OUR DRONE SURVEYING COURSES

Reach new heights with our comprehensive 3-day Drone Surveying Courses in Christchurch and Auckland
Register at ferntechcommercial.co.nz/training

CALL US ON 09 399 2084 FERNTECHCOMMERCIAL.CO.NZ

Ferntech
COMMERCIAL AERIAL SOLUTIONS

Empowering Innovation with LocationTech+

REPRESENTING THE SECTOR for more than a decade, the Spatial Industry Business Association (SIBA) has a new voice for the future.

During the past year, SIBA has been on a transformational journey that has seen it reinvented as LocationTech, an NZTech community and part of the Tech Alliance.

SIBA Chair Anne Harper says that in the past decade, location-based technology has established itself in almost every industry in New Zealand and globally. Geospatial technology was once a backroom tool but is now a core business system for many.

In this Q&A, Anne and NZTech's CEO, Graeme Muller, discuss their collective strength.

Q1: Graeme, for those who don't know NZTech, how would you describe it?

NZTech is a purpose-driven, not-for-profit, non-governmental organisation (NGO) that is membership funded and brings together organisations from across the broad and diverse New Zealand tech ecosystem.

The impact of technology is so broad, touching all parts of the economy and society so having a shared sense of purpose enables us to be more relevant across New Zealand. Our purpose is to help create a prosperous New Zealand underpinned by technology. We often articulate this as technology being

critical for the entire country and that it is not just about the tech sector.

To achieve our purpose, we focus on three main strategic objectives. First, we work to help *connect* tech ecosystems, organisations and people to each other. Then, we work to *promote* the importance of technology to New Zealanders, and New Zealand's technology to the world. Finally, we work to help *advance* the foundations needed for a successful digital nation including tech in education, connectivity, security, access, and trade.

Q2: Graeme, NZTech hosts a number of different tech communities including Agritech New Zealand or the New Zealand IoT Alliance. Can you tell me more about the types of communities you have?

The Tech Alliance includes 22 tech associations, collectively representing more than 1000 unique organisations, which employ more than 10 per cent of the workforce.

Within the NZTech group, there are three types of tech communities. There are sector-specific groups such as AgriTech, EdTech, FinTech, GovTech, InsurTech and WealthTech. There are technology-specific groups such as AI Forum, BioTechNZ, Blockchain, Digital Identity NZ and the New Zealand IoT Alliance. There are also people-centric groups such as Tech Marketers, Tech Leaders and Tech Women.

Each of these communities operates on the same strategic framework, where they have a strong purpose to help make New Zealand more prosperous. They work towards achieving their purpose with Connect, Promote and Advance strategies.

Q3: Anne, how have you seen the spatial industry evolve over the past decade and what has this meant to the community that LocationTech represents?

The industry has grown within and across sectors. We are seeing the geographical aspect of information grow significantly through products and services. We know it is a pervasive technology and we see it far and wide. The industry has also become really secure and known in its identity and value.

Q4: Anne, was the decision to join NZTech easy?

It was easy because we could see the immediate value. We socialised thoroughly within our membership and stakeholders, who could also see the value and were excited to move and connect.

Q5: Graeme, what role do you think spatial information plays in the tech industry?

It is becoming apparent that certain technologies are the new foundations for the future success of our nation and its businesses. Data and spatial data are fundamental elements for many new services and technologies. It is important that we raise the awareness and understanding of the opportunities that spatial data can provide for New Zealand, and ensure relationships and discussions are under way to support good policy and investment decisions.

Q6: Graeme, what benefit does NZTech bring to existing LocationTech members?

NZTech is a platform that can help LocationTech members better support their collective purpose, and in doing so identify and extract more direct tangible value for themselves.

Often, I describe the NZTech Group with an analogy. Consider joining a nationwide chain of fitness gyms. As a member, you need to be clear on why you've joined. What do you want to achieve? Are you training to run a marathon, lose weight, ride faster, get fit? We can show you the weights area, group fitness or spin classes. We can even help put in place a training plan and send you reminders to come to the gym.

But we won't wake you up, drag you out of bed and drive you there every morning. Perhaps you prefer to exercise during the day or in the evening? Either way, you need to know why you are going to the gym and how to make your gym membership work for you. It's the same with our membership, you get out of it what you put in.

Q7: Anne, one of the benefits of LocationTech is that members can join multiple communities. Why do you think organisations which aren't currently LocationTech members should join us?

To further activate location technologies as part of their business. Many organisations have capability or know how richer location information could help with their operations. Joining LocationTech will help businesses and organisations to advance the work they are doing by connecting with other innovators.

Q8: Graeme, how does NZTech bring communities together?

Fundamentally, NZTech helps the communities work together better. Behind the scenes we create shared tools, processes and infrastructure. Meanwhile, in the market we work together better through shared events and policy work. We often see groups bringing their members together for mutual benefit. For example, recently FinTechNZ and Digital Identity NZ held a series of combined member events, exploring the role of digital identity for new fintech services.

Q 9: Anne, LocationTech's mission is to "establish LocationTech New Zealand as the voice of location technology and spatial intelligence in New Zealand". What does this mean?

I believe that over the past 10 years of SIBA, we created a clear industry identity. Now, it's increasingly important to promote and connect with organisations which want to activate and advance their business with the technology.

Our renewed purpose is to empower innovation with location-based technology. As the voice of location technology in New Zealand, we aim to:

- Expand the location technology industry as a sustainable and increasingly significant business sector in the national economy.
- Promote the value of adopting and using location information and technologies.
- Build on existing opportunities for the private sector of the industry.
- Ensure the industry is ready to adapt and take advantage of new opportunities.

Q10: Anne, how does being a part of NZTech enable LocationTech?

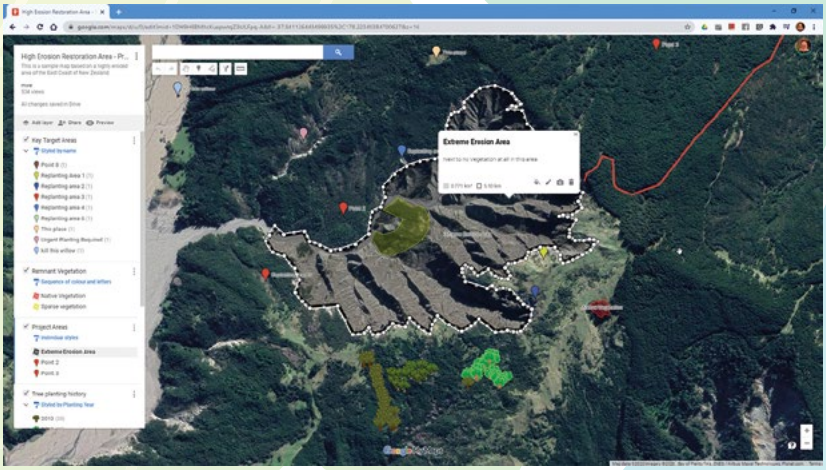
Put simply, being part of the Tech Alliance better connects our members with other business communities. We can further leverage NZTech's channels to share LocationTech messages alongside relevant communications, events and research. It also greatly enhances the work that other organisations are doing.

Q11: Anne, after three years as Chair, you have decided to step down from your role. What have been your personal highlights during your time as Chair?

Believing we could transform our association for a brighter future has been a notable highlight. While there was risk, SIBA was a successful engaged organisation, and we believed we could provide even more for New Zealand businesses. I feel the transformation has been a success because we have maintained member engagement and the committee has remained stable. Ultimately, the risk of staying static was greater than having a vision for the future of our industry.

The current and former members of the LocationTech executive committee would like to thank Anne for her outstanding leadership as the Chair of SIBA. Anne has overseen the transformation of SIBA as NZTech's newest community and although she is resigning as Chair, she will continue to represent LocationTech as our ambassador. Anne is handing over the reins to the current Deputy Chair, Sam Drummond.

For further information on LocationTech, please visit *www.locationtech.org.nz*



An example of an environmental restoration mapping project using Google My Maps.

GIS Mapping with Māori Groups and Community Projects

Duane Wilkins, Senior Advisor, Geospatial Capability Building, Land Information New Zealand

GIS MAPPING TOOLS can help Māori groups visualise their connections to the land, communicate stories, and gather knowledge about a group's history, the landscape and its natural resources.

Land Information New Zealand (LINZ) is supporting Māori and community groups to increase their capability to access and use geospatial information. Over the coming months, the geospatial capability team at LINZ is partnering with members of the Māori GIS Association and others to facilitate a series of online step-by-step tutorials based on many of the shared key interests of Māori communities. Everyone is welcome to join us.

Working with Māori and local communities to grow their geospatial capability is a rewarding experience. We thought it would be useful to share with you some of the interests these groups have that can be represented in maps.

Mapping sites of significance and areas of interest

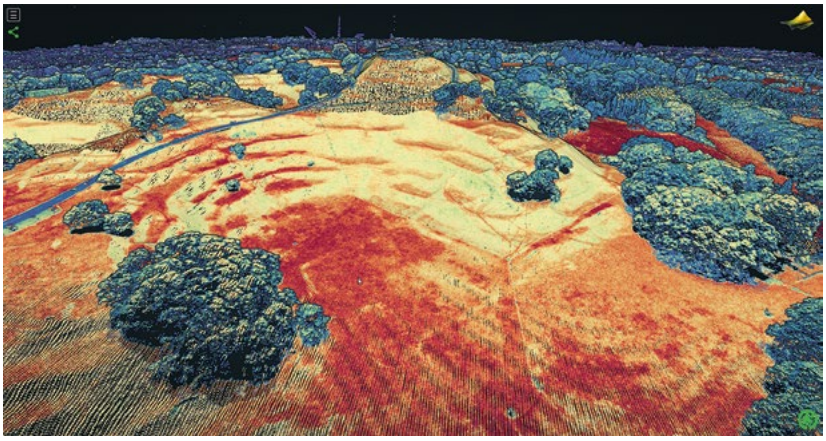
Sites of significance represent the special and long-term relationship that a community has with the landscape. These may be locations or areas that have historical or cultural value, or are associated with an event or individuals, and are defined and identified by those communities. Collectively, this information can be referred to as visualising a whakapapa, origins or connections to the landscape.

Sites and areas of interest vary but may include mountains, rivers, gardens, fishing sites, place names, hunting grounds, burial sites, historical villages, caves, and wider areas where resources may have been collected, and many others. Often the name indicates the event or significance of a place.

The Ngāi Tahu Cultural Atlas provides access to more than 1000 traditional place names, travel routes and associated histories of the Ngāi Tahu tribal area. You can view their stories, journeys and maps at *www.kahurumanu.co.nz*.

Something we can do as GIS practitioners to support this work is to introduce the concept of connected 'graph' or 'topological' logic. For example, if a marae existed, there will likely have been historical gardens, fishing spots, tracks and associated resources. Each may have a specific name, and often historical 'Māori land sketch plans' or 'Initial block survey plans' can help to identify sites lost to living memory.

Before mapping sites of significance, you will also want to consider the different thematic types of symbology required, description, references and source fields. It is worth having a conversation about themes and types or categories, which can also be used to help break down what might seem an overwhelming project into more tangible and achievable tasks by doing one category at a time. Involving groups at this stage to make their own data schema decisions will help grow their understanding as the project progresses.



Sample LiDAR from Auckland Council, 2013 via *OpenTopography.org* of Maungakiekie/One Tree Hill in Auckland, looking north.

Technologies

Technologies are advancing year on year to being 'online first' focused. Google Earth Desktop enabled the use of 3D visualisations of significant sites in Waitangi Tribunal hearings, providing the ability for touring from place to place following traditional stories, which could be thought of as a form of historical maps to aid navigation. These are now moving online.

There are many free desktop and online GIS options to consider such as QGIS, ArcGIS StoryMaps, an ArcGIS Online personal account, Google My Maps and Google Earth Web.

In non-profit or zero-budget group scenarios, some of the free online tools like Google My Maps, Google Earth Web (and unlisted YouTube for video) are a good starting point. Once a group's capability grows, other options can be considered as well, such as ArcGIS Online, QGIS and other apps as suits their needs.

Something to consider is data storage, safety, and longevity – where will the data sit in 5, 10 or 20 years' time? There is no simple answer and a strategy combining physical USB drives and cloud storage is required.

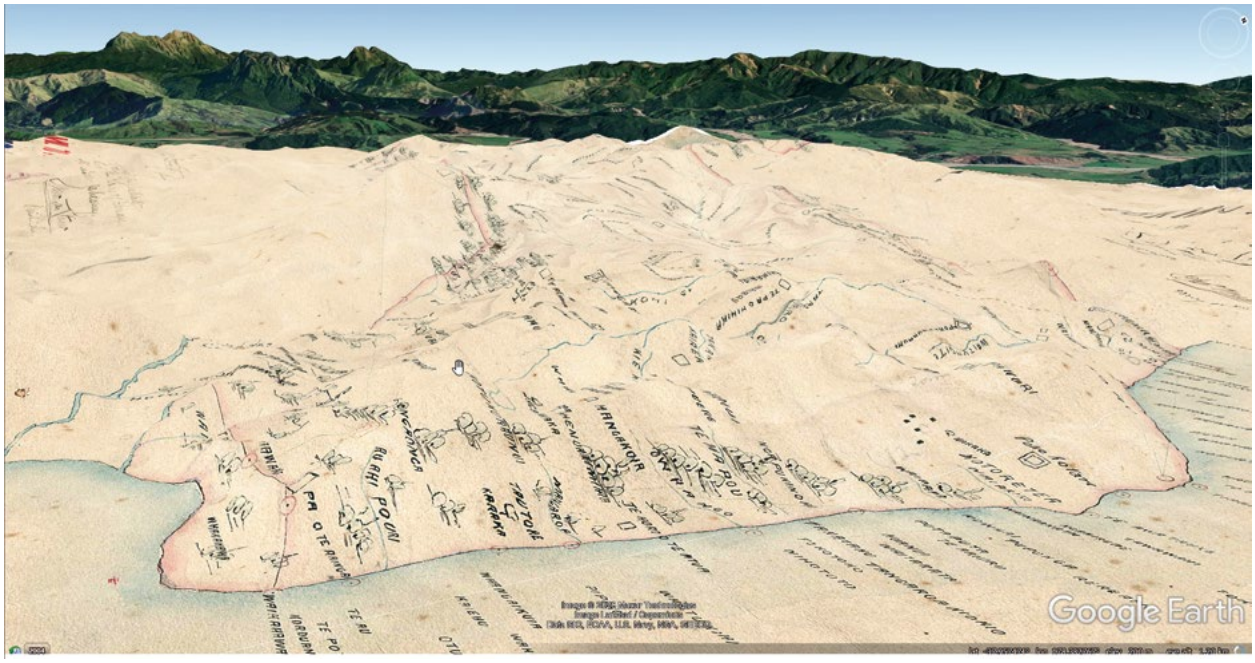
Frequently sites are represented as points, however with LiDAR and high-resolution imagery, it is now possible to digitise sites in vastly more detail with desktop tools. LiDAR data from OpenTopography.org can be used to explore 3D LiDAR in a web browser without the need for storage, servers or software installation.

However, start simple. Develop a set of point locations and then come back around to identifying areas and iteratively gathering more detail for each site including references, interview footage and documents.

Historical land blocks

Historical sketch and survey plans or 'ML plans' (Māori land) in the mid to late 1800s were a tool of colonisation and land alienation but can be used to provide a source of names and places lost to living memory.

There are generally two ways to access scanned ML plans. The better option is to seek support for what are called 'the first 300,000' plans on a DVD set from the Institute of Cadastral Surveying Incorporated or other suppliers for about $800.



An example of the historical ML700 Survey Plan overlaid in Google Earth Pro desktop with historical places identified on the plan.

The second option is to order individual scanned plans from LINZ (at a cost of $15) from *linz.govt.nz/land/land-records/order-copy-land-record*.

Many research reports completed as part of Waitangi Tribunal hearing preparations were able to identify the original, initial or parent block. These were used to allocate ownership, and often a portion was carved off and sold to pay the surveyor. Subsequent divisions, partitions and conglomerations over the years make up the modern parcel fabric.

The sketch plans for each block often provide the most useful markers, however they are also some of the most difficult to georeference. Some parts can be matched to the landscape, but not without significant distortion of other areas, so judgment is needed when georeferencing.

To overlay an ML plan in GIS software, you can align them using a variety of features from the LINZ Data Service including parcels, named rivers and spot heights.

Overlaying and rubber sheeting an historical map accurately requires a reasonable level of capability and patience. Where accuracy is not paramount, Google Earth Pro desktop can be used to provide a quick and effective 3D visualisation within seconds.

Representing change over time

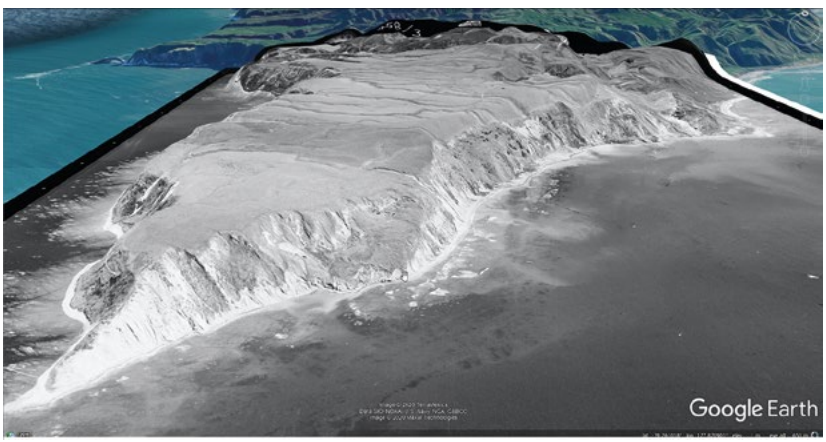
Environmental monitoring and processing Resource Management Act consents are a key activity of many Māori trusts.

Historical imagery can be used to support monitoring change over time, and we are lucky to now have several great sources. Let's start with the most recent, and then travel back in history.

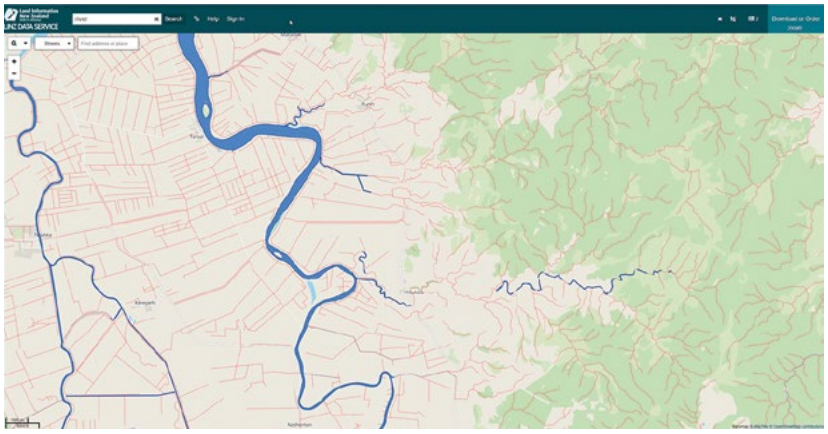
Using the Yellow 'Pegman' in Google Maps, 360 Streetview imagery now contains at least one spherical image for every road and street in New Zealand. In many areas, at the top left of a sphere, you can view two to three earlier captures over the past few years.

The LINZ Data Service (*data.linz.govt.nz*) has a growing collection of aerial photography from the mid-2000s to the present.

For many parts of New Zealand, the LINZ Data Service also provides high-resolution orthophotos from the mid 1990s, and then one or more layers of aerial photography from the early 2000s.



A historical 1940s aerial photo from Retrolens.nz overlaid near the Rocket Lab spaceport at Mahia Peninsula.



Named river lines and polygons available from the LINZ Data Service: *data.linz.govt.nz/x/aEvjGB*.

Google Earth Pro desktop and the Esri ArcGIS Online Living Atlas 'Wayback' map service provide access to historical satellite imagery, in high resolution, back to the early 2000s as well as Landsat imagery back to around 1984. Another fun fact is Google Earth Pro historical imagery sometimes hides newer imagery favouring older, higher quality images.

And finally, *Retrolens.nz* provides access to historical aerial photos for all New Zealand, that generally cover decade on decade from the 1930s. Unfortunately, forest clearance in most areas had already occurred by the time these photographs were taken.

Monitoring the environment and restorations

In addition to monitoring change over time using imagery, many groups will want to develop their own systems to independently monitor environmental factors such as water quality, as well as perform cultural impact assessments of sites.

A free hosted tool that can be used to implement offline forms for data capture is called 'Kobotoolbox', which uses XLS data template standards and has basic mapping capability. Survey123 can also provide integrated data capture with an ArcGIS Online site but requires at least a non-profit licence (about $250 per user, per year).

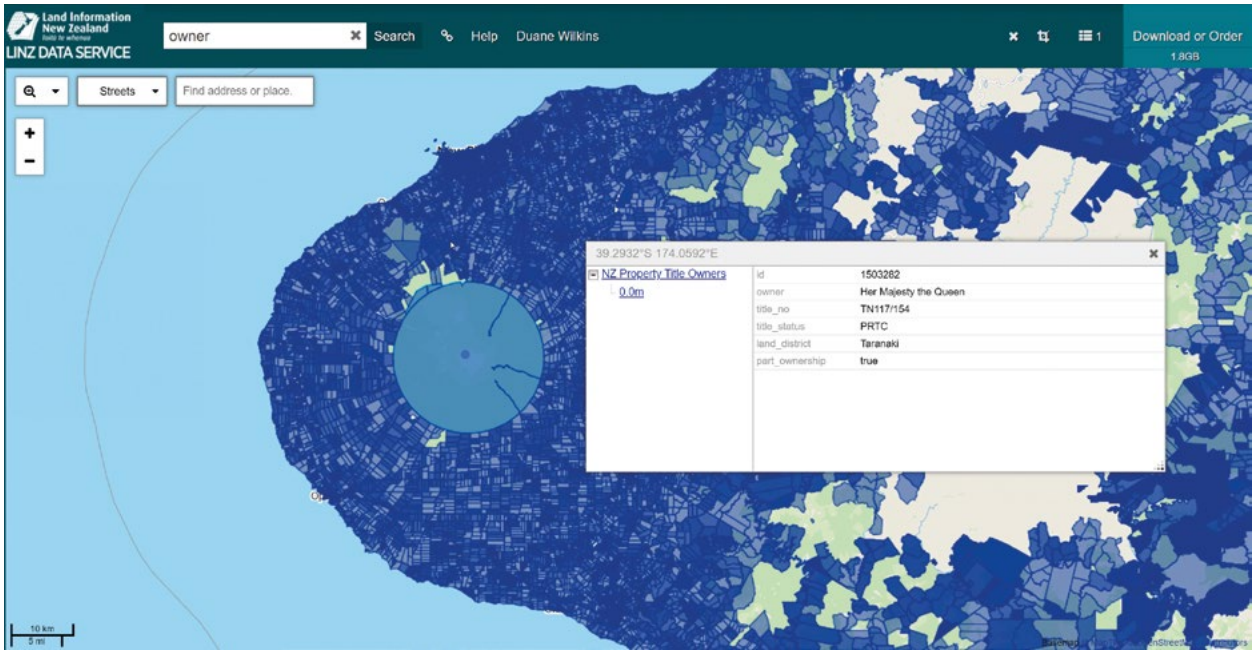
Tip: A simple technique is to assign unique site location IDs so that multiple records per site can be taken to show change over time by relating records to a unique ID. Most groups will be familiar with SHMAK test kits from NIWA, but if these are not available, simple observations or photographs could be captured to start with.

There are several related datasets that could be of interest, including the LINZ named rivers dataset; the River Environment Catchment layers are available from the MFE data service, although they do require some expertise to interpret and use.

Identifying properties

Many post-settlement groups will want to identify land parcels returned to them as part of their settlement, or areas where statutory acknowledgments apply.

Settlement legislation will often list the titles to these parcels, but it is laborious to identify parcels one title at a time (from settlement legislation) even for experienced GIS practitioners.



Property titles including owners, data example: *data.linz.govt.nz/x/VPMpKu*.

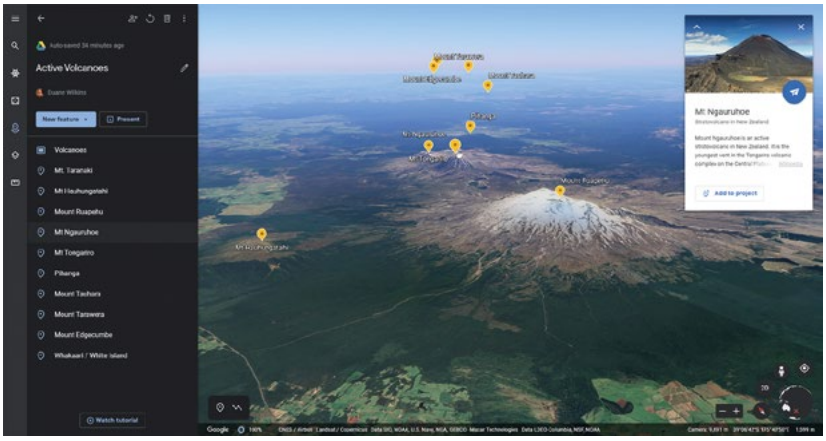
*To access the title and owner data, you'll need to request access to the Controlled Access Group on the LINZ Data Service: *data.linz.govt.nz/x/DcjkwR*.

Tricks for those new to parcel data editing:

- Within the 'Titles and Named Owners' data downloaded from the LINZ Data Service, you can query for any matching terms within the title and owner names listings.
- Within the 'Primary Parcels' layer, you can query the non-blank records on the 'statutory actions' field.

Parcel editing tips:

- Rather than create new layers from a patchwork of single parcels or files, add a single 'Is_of_Interest' True/False field to the above data and calculate that field with a 'Y' based on various queries and manual selections.
- Then 'create a new layer' from a selection or query based on that 'Y' field, meaning you can go back later and remove or add additional parcels by adjusting those that have a 'Y' without needing to delete any parcels you may want to refer to later.
- You can also add a comments field to the source data layer and those comments will come through into the query layer.
- Download and curate the 'Māori Land' data for the area of interest from the Māori Land Court; there may be overlaps.
- You may also be able to source GIS data from the local council that describe settlement implementation arrangements.



A very simple volcano tour using Google Earth Web. Access this story at *tinyurl.com/volcmap*.

3D storytelling

3D visualisations for many people are a 'nice-to-have', but then we fall back to standard 2D maps. Māori communities have a natural affinity for 3D visualisations and these help the viewer to better orientate and understand the map being shown and should be used wherever possible for place-to-place touring and storytelling.

Google Earth Pro calls bookmarks 'snapshot views'. Esri ArcGIS Online users call these 'slides' and desktop users call them "bookmarks".

A few tips for 3D flythrough optimisation:

- Manipulate the view to ensure most viewpoints have a slither of the horizon which helps reduce dizziness for the viewer and improves scale and perspective.
- When storytelling a place-to-place journey, try to orientate each view to include the 'next location' in the background of the 'current view' – this creates a series of related and connected perspectives rather than discrete views that are difficult to connect.
- Use curved but gentle 3D movement 'swoops' and avoid straight point-to-point lines by adjusting the default perspective of each site, creating the experience of a series of gentle swings or curves to each location.

And finally, I almost always start my 3D stories with a view from orbit in space – because we can! Most 3D tools will animate a beautiful movie like zooming through the clouds to your site of interest.

Waiho i te toipoto, kaua i te toiroa
Let us keep close together, not wide apart

During these challenging times, it is important to remain connected; we invite you to join our upcoming online tutorial series building on some of the themes in this article. Keep an eye out on the LINZ social media pages and as always, we welcome your feedback. Just email *capability@linz.govt.nz*. ●

Māori communities have a natural affinity for 3D visualisations and these help the viewer to better orientate and understand the map being shown and should be used wherever possible for place-to-place touring and storytelling.

Fighting Middle-Aged Spread in Business

Edward O'Leary,
Abtrac Time Management & Invoicing Software

Some people get to a certain age and one day they look in the mirror, or maybe they try on their favourite shirt, and they wonder, "What happened?". What happened to that well-ripped body.

The six pack is morphing into one squidgy ab. And the pecs are slowly reaching down for our belly button. The problem is, some people 'let things go a little'. This doesn't happen to everyone. But it does happen.

Like middle aged spread in some of us, at a certain age, some businesses go the same way. The founding directors, even though it's still their business, 'let things go a little'. I see it all the time. Businesses get busy. Founding directors get busy. And things slip passed them that wouldn't have got through a few years earlier.

The problem is often articulated as some variant of "I'm too busy and there's work to be done". That can be almost plausible. But the reality is the people who should be keeping an eye on the business allow themselves to become too busy. They do the things they prefer to do, rather than the things they should be doing.

Managers and directors should be managing and directing. That's their role. That's their job. But too many of them do not.

In our business providing software to professional services firms, the symptoms are often pretty easy to see.

- The invoicing cycle takes too long to get started each month and too long to complete.
- Project managers and office managers are never quite sure where each project is up to, what was in scope, what has been billed so far, and what is still to be completed. They survive on a myriad of spreadsheets.

You don't have to completely change your world. You can still do the fun bits. But if your role is to manage and direct then that means others are only as effective as you allow them to be through your management and direction.

- Some give up completely, but fortunately this isn't seen too often, "We don't need to manage things too closely because we only work on fixed price contracts". To which I say piffle, bosh, bunkum!!

When in essence all your business is selling is the collective time and expertise of everyone in the office, there's no room for a laissez-faire approach to management. I believe managing a professional service business is all about time management. That means time planning for yourself, and everyone else, knowing what time has actually been spent, how much is left to go, and getting things done on time. You do that by spending everyone's time wisely, including your own. That means:

- Committing to times on projects (internally and probably also with the client)
- Making sure invoicing is correctly reflecting the value of time spent, and
- Knowing what to do next time, based on knowing what time was spent last time, even if at the end of the day you invoice the client on some 'non-time based' basis.

And that'll only happen if managers and directors actually spend time managing and directing as one of the main parts of their job.

Fortunately, as with those abs that are turning to flab, the sooner you make a few life-style tweaks the easier it will be to get back on track. Or should I say work-style tweaks?

You don't have to completely change your world. You can still do the fun bits. But if your role is to manage and direct then that means others are only as effective as you allow them to be through your management and direction.

If you're a one-person band it's OK to take it easy. If you're a director in an office of many professionals, it's not OK. Without management and direction, at best things will incrementally become haphazard. The office becomes inefficient. People who feel surrounded by transparent inefficiencies become cynical. And the good people leave.

Every week, you need to know what needs to be done. Ahead of each coming week you'll have things you can see two weeks out and some are longer term. There's client work, administration work, office maintenance. Everything. Then for everyone you're responsible for, you need to marry up whatever needs to be done with the people available and able to do it. It's a list of things to do, spreading the work around everyone in the office.

Easy right? That's right, managing and directing a professional services firm isn't difficult. But there's no auto-pilot either. So if you're not wanting to end up with chronic 'middle-aged spread' in your business, stop it today by starting down a new path – today.

5 differences between a good recruiter — and a cowboy...

Here are 5 tell-tale signs to help you discern a kick-ass recruiter from a drop-kick...

1. Good recruiters will meet you face to face
Clever recruiters have deep insights of the companies they represent so they'll meet you In real life to get an understanding of your personality. This will help them decide whether you'll be a good cultural fit for a business or not, which contributes massively to how much you'll enjoy working at your new company.

2. Good recruiters have in-depth knowledge of the industry
The best recruiters usually work with a specific industry and have in-depth knowledge of that industry. Amateur recruiters "dabble" in multiple industries. Good recruiters have built exceptional relationships with the decision-makers in their chosen industry and have access to those jobs that don't even get advertised — often the best roles...

3. Good recruiters keep you updated
If you find yourself desperately emailing your recruiter, pleading for progress, move on. A good recruiter will happily (but metaphorically) hold your hand through the process — they won't leave you feeling needy, like a bad recruiter will.

4. Good recruiters respect your career goals
If you're ever involved in a conversation where the recruiter's trying to persuade you to accept a role that you're not really interested in and it makes you feel undervalued, despite you being clear about what you want? Hang up as soon as you can.

5. Good recruiters focus on long-term relationships, bad recruiters on one-night stands
Bad recruiters dump your CV into the recruitment pipeline and only contact you if there's good news. Maybe they hate to be the bearers of bad news, or maybe they're just emotionless pimps. Either way, it's no good for a candidate or a business. A good recruiter walks the extra mile to ensure their clients and candidates achieve what they want.

EIGHTY4 ONLY HAS RECRUITERS OF THE GOOD SORT.
We have multiple job opportunities NZ-wide. Contact us now for a confidential chat and FREE salary check.

CONTACT:
Mark Fisher
021 347 445
mark@eighty4recruitment.com

Sean Buck
027 587 5726
sean@eighty4recruitment.com

Eighty4 — RECRUITMENT —

Survey and Spatial New Zealand Diamond Partner

A long-standing partnership

Since 2005 we've been understanding what sets businesses apart, what makes them tick, and what makes them grow. Woods & Partners is one of those businesses. And our knowledge of the work they began undertaking with drones allowed us to write one of the first policies in New Zealand designed to specifically protect surveyors and engineers for the particular risks they face each time they use one.

We've partnered with almost 100 firms throughout New Zealand to create the cover they need. If yours isn't one of them, let's talk.

gsi.nz

WOODS
Est.1970

GSI
Insurance
Partners

GRADUATION AT THE UNIVERSITY OF OTAGO

William Alexander Robertson

Citation for Doctor of Science – Honoris Causa

Bill Robertson grew up on a sheep farm in the Wairau Valley near Blenheim. He attended Pine Valley Primary School, a sole-teacher, nine-pupil school. He did two years of high school by correspondence but he says he was not good at paying attention so correspondence did not work so well.

He then attended St Bede's College as a boarder where he had to 'pull his socks up'. As the end of school loomed, Bill was still unsure of his future career. He considered the navy and civil engineering, but the problem was solved by a chance encounter with a Lands and Survey officer who asked the most fundamental question. – "What do you like?".

Bill really liked being outdoors in the wild, travelling, hunting, shooting and fishing. What was he good at? Well, he had a head for numbers. He was good at trigonometry. It was settled.

Bill began his working life in 1954 as a draughting cadet in the Blenheim office of the Lands and

Survey Department. As Bill tells it, he wasn't neat enough for draughting. Fortunately he was soon appointed survey cadet.

So began the long and illustrious career of one of New Zealand's greatest public servants who would eventually become Surveyor-General and Director-General of the Department of Survey and Land Information. Bill's work would help make fundamental changes to many aspects of New Zealand life that most of us take for granted such as planning a trip, exploring a national park, buying a house, and voting.

Surveying would take Bill deep into Aotearoa New Zealand's back country, south to Antarctica, north to Malaysia, and across the globe as a land administration expert working for NZAID, AUSAID, the World Bank, United Nations, FAO, the Permanent Court of Arbitration in the Pacific, South-East Asia, China, the Middle East and Africa. There he helped land administration projects and determined the locations of disputed international borders including the Iraq-Kuwait border after the first Gulf war. The work was challenging, physically, personally and sometimes politically.

Bills early career was full of travel which he loved but moving from house to house –13 of them – all became too difficult. Bill took a job as planning surveyor at Head Office in Wellington where he finally settled down with his wife, Judy, and their growing family – Mark, Paul, Peter and Hamish.

Bill adapted to his new life in Head Office and it soon became clear that, as well as being an excellent surveyor, he was also an exceptional leader. Colleagues describe him as judging his own success by how well he helped others to succeed. Bill, they say was always forward looking, and particularly interested in how new technology might change the department. What were the opportunities? What would staff need to learn? How could this help New Zealanders?

Bill (Ngai Tahu, Scottish and Irish) was also alert to social change; early on he recognised the significance of biculturalism in the public service. He actively encouraged the recognition of tikanga and promoted the importance of te reo Māori and was determined that the department would become a trusted source of information for Māori in the resolution of land claims.

As Surveyor-General and Director-General of the Department of Survey and Land Information from 1987 to 1996, Bill chaired the New Zealand Geographic Board and he was part of the effort to ensure that place names reflected the full sweep of the country's history.

As Surveyor-General on the Electoral Boundaries Commission, he provided the first draft of new electoral boundaries each census, instituting procedures that strengthened New Zealand's enviable tradition of political neutrality in the drawing of electoral boundaries. Bill was appointed an honorary colonel by the New Zealand Army as its Director of Military Mapping and Geodesy. He represented New Zealand at the annual Five Nations military survey and mapping meetings for nine politically sensitive years.

Throughout his career, Bill has been a consistent supporter of the University of Otago and its National School of Surveying. He worked closely Professor Basil Jones to develop BSc degrees which he supported with computer finance and by moving technical staff to Dunedin so they could enrol as fulltime students. This upskilling produced a generation of men and women who formed the backbone digital mapping and spatial data base innovations subsequently undertaken by the Department of Survey and Land Information.

What was his most important achievement? There were many to choose from, but Bill well remembers the day he was told by Finance Minister Roger Douglas that the department could no longer be primarily funded by taxpayers. It would have to earn its way through charging for services and its budget would be cut by 50 per cent – which turned out to be 70 per cent!

There was a real chance the department would be broken apart, ending its proud record of innovation and scattering its bright young staff whom Bill had done so much to develop. However, under Bill's leadership, the department continued to meet its increasingly challenging cost-recovery levels. After 10 years, it had surpassed the end goal of 70 per cent by an additional 7 per cent.

Bill believes that challenges are opportunities. What matters is how you adapt. Colleagues describe him as always seeming to be one step ahead, always having a clear vision of the way forward. Under his leadership the department thrived and became a world leader among such organisations.

And that was possible because Bill is essentially an optimist who believes in people with whom he works and in the power of innovation. Above all, Bill Robertson is driven by a fundamental ethic of service to Aotearoa and its people. ●

Smart Routing for Small Business: helping Kiwi businesses deliver

Mary Sue Critchlow, General Manager, Critchlow Geospatial

While most SMEs probably remain blissfully unaware of the benefits that geospatial technology provides, **Smart Routing For Small Business** is a great introduction into how geospatial information and technology can be applied to create powerful and much-needed solutions for these businesses.

The home delivery of goods direct to consumers has been a growing trend for a number of years. However, the arrival and ongoing management of Covid-19 has meant many New Zealand small and medium businesses have had to add a 'delivery-as-a-service' offering, almost overnight.

For the average SME business owner just beginning to offer delivery as a service, route optimisation is likely to have appeared initially to be a relatively straightforward logistical planning and mapping exercise.

Their learning curve was, no doubt, a steep one, as the freely available mapping solutions out there are simply not fit for purpose when it comes to route optimisation, putting limitations on the number of delivery addresses, and they are only as good as the data that underpins the technology anyway.

Helping New Zealand's businesses deliver during through Covid-19 and beyond

At Critchlow Geospatial, we've been helping New Zealand's transport, distribution and logistics businesses with route planning and optimisation solutions for many years. We knew that New Zealand SME businesses would be finding delivery extremely challenging, creating additional cost and putting additional pressure on their limited resources when they could least afford it.

We also knew that, thanks to our partnership with NationalMap (and its market-leading roads and transport network data), we were uniquely placed to help SMEs ramp up or adapt to delivery-as-a-service.

Smart Routing for Small Business

In the days leading up to Level 4, we decided to fast-track a product that we have called ***Smart Routing for Small Business***.

Harnessing the very latest technology and the complex algorithms required to design and present optimal delivery routes, the idea was to create an affordable and easy-to-use online solution to enable SMEs to add or scale up their delivery as a service pain-free.

Smart Routing for Small Business has been designed to allow SMEs to know the exact locations and access points that they need to deliver to, and the best way to get there. In doing so, SMEs can now:

- Confidently forecast, plan for and manage the demand for their products
- Improve productivity through automation, and manage their human resources optimally (make sure drivers are not put under unrealistic time pressures)
- Advise their customers when to expect their deliveries
- Minimise mileage/vehicle costs and reduce emissions.

Smart Routing for Small Business not only allows SMEs to survive, it helps them thrive by growing their businesses. Route optimisation reveals opportunities to increase delivery capacity, and if a business charges for delivery services, both of these additional revenues (goods and delivery fees) go straight to the bottom line.

Consumer demand for home delivery of goods of all types shows no sign of slowing, so investing in a route planning and optimisation solution can not only help New Zealand businesses weather the Covid-19 storm, but actually grow their businesses and thrive in our 'new normal'.

To find out more: visit *www.critchlow.co.nz*. ●

FreshBake, a bakery in the town of Brightwater, near Nelson, believes smart routing could be growing its business by around $50,000 a year in new revenue.

For shelf-sensitive goods such as baked goods, drivers need to ensure they arrive at the right address in a timely fashion. So, timeliness and validating delivery addresses before the driver leaves the depot are critical.

The outbreak of Covid-19 significantly increased demand for FreshBake's products and that brought with it delivery challenges. Smart Routing for Small Business provided FreshBake with the ability to load plan (make sure that goods are loaded in the correct sequence for delivery) and deliver within time windows, ensuring not just accuracy but timeliness as well – an important consideration for the shelf-sensitive or urgent product offerings.

With Critchlow's **Smart Routing For Small Business** in place, FreshBake has its eye on future growth.

"You can't scale an online delivery option without the ability to load plan. A smart route delivery planner is an integral factor on the path to growth because it takes the guesswork out of order fulfilment," says Shelly Sims, FreshBake's owner.

Landonline rebuild for surveys on track

Nick Stillwell, Lead Consultant Surveyor, Rebuilding Landonline, LINZ

In April 2019, Land Information New Zealand (LINZ) began work on the Rebuilding Landonline programme with the first software developers starting in earnest. For surveyors, it has been a longer journey, with the idea of a replacement for Landonline first mooted several years earlier.

I have been involved with the programme as a representative of surveyors since late 2017. As the development work on the survey part of Landonline is about to begin, it is worth a quick recap on where we have come from.

In mid-2018, I visited surveyors across New Zealand to capture feedback on their issues with Landonline. Since then, I have worked with the Survey Working Group to extract the key feedback themes from the vast feedback surveyors have provided.

Feedback includes:

- Issues working between survey software and Landonline need to be resolved
- The CSD plan needs improvement
- Search needs to be more intuitive
- We need one good set of validation tools
- Linking is unnecessarily constraining our workflow
- The process for easements needs streamlining
- There needs to be support for a 3D digital cadastre
- The system needs to be designed with validation in mind.

Since compiling these feedback themes with the Survey Working Group, I have been out testing them with surveyors to see if they feel right. So far, the feedback has been overwhelmingly positive – if you don't think they are right, please do get in touch.

These themes are now well understood by the team working on rebuilding Landonline. However, it isn't as simple as just jumping in and making improvements – the first rebuild steps are significant but largely invisible to the system's end users.

A large amount of work has been under way over the past year to plan and test the approach to migrating the database to a new system, which is a foundational and critical step. These foundational platform changes will pave the way for ongoing system improvements.

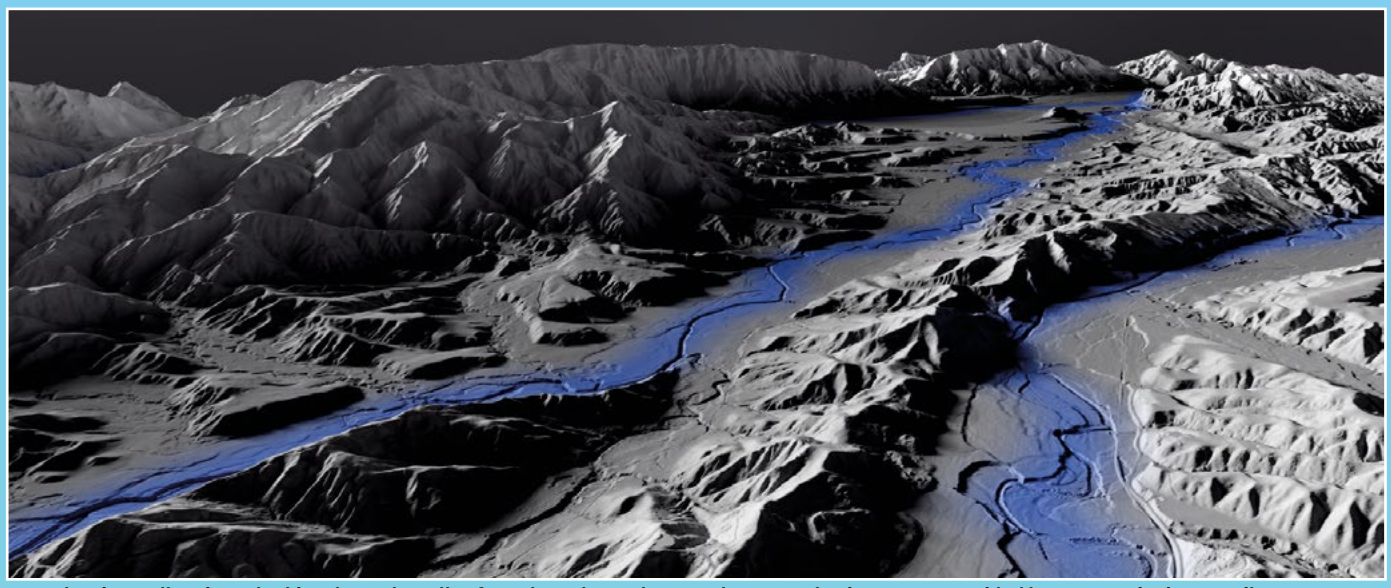
So when will surveyors see something? LINZ is working on some initial designs for how the new system could look and feel. They look pretty good, but I am really looking forward to the next step when they will be tested with the Survey Working Group, then with another selection of surveyors, to check if they are heading in the right direction. The same process will happen again with some initial working software of survey functionality.

When will surveyors first have something they can use in the new system? With development just kicking off, it is expected that in the next 12-18 months, a first usable version of software will be available.

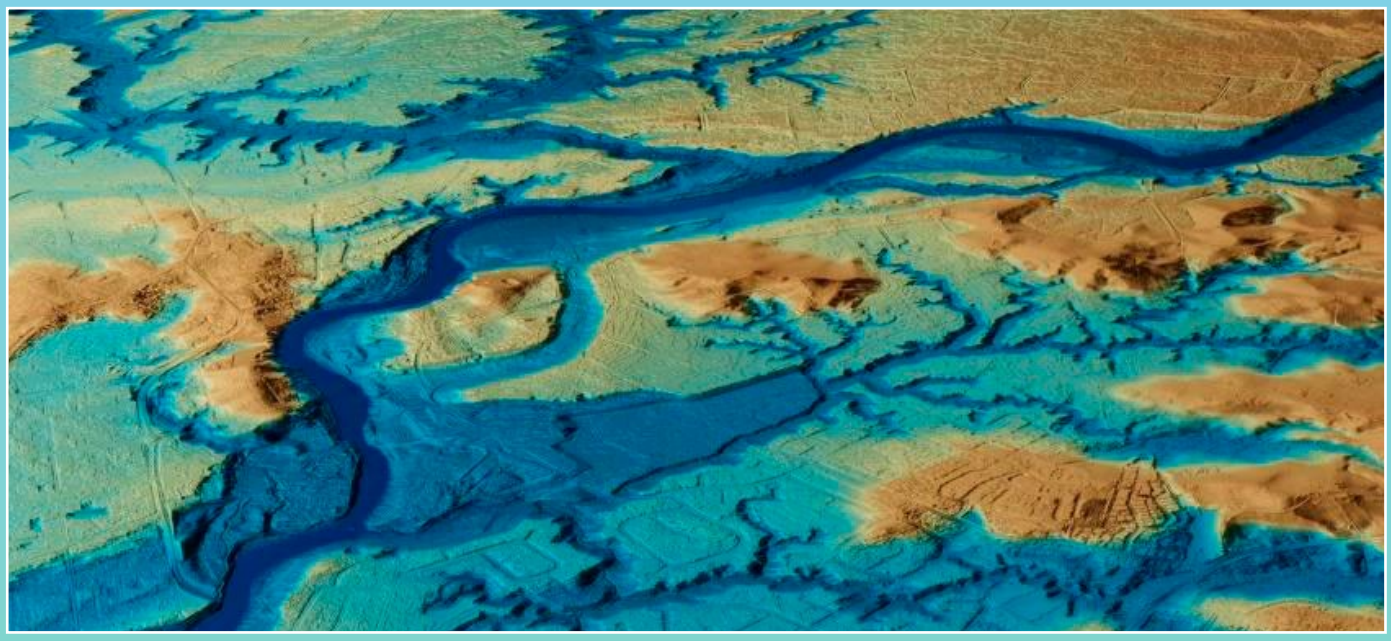
I'll have more on what might be included in my next update.

Nick Stillwell is an employee of Survey + Spatial NZ and is working with LINZ on Rebuilding Landonline.

[Initial designs] look pretty good, but I am really looking forward to the next step when they will be tested with the Survey Working Group, then with another selection of surveyors, to check if they are heading in the right direction.



Motueka River valley LiDAR, looking down the valley from the Tadmor, Sherry and Wangapeka rivers. Data provided by Tasman District Council. Image: LINZ



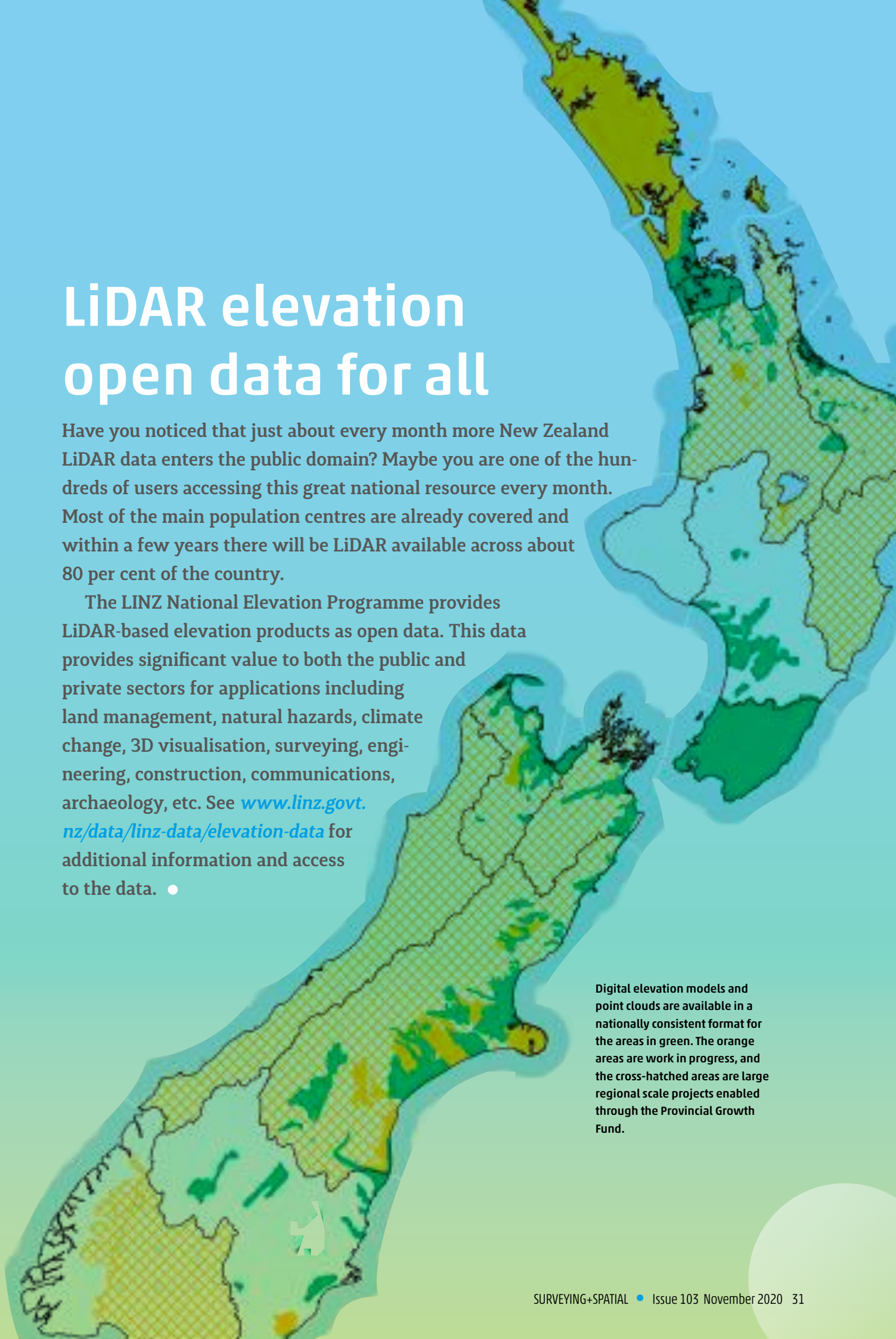
Waikato River LiDAR through Hamilton highlighting how rivers shape the land. Data provided by Hamilton City Council. Image: LINZ

Tauranga LiDAR visualisation of Mount Maunganui. Data provided by BOPLASS Ltd. Image: LINZ

LiDAR elevation open data for all

Have you noticed that just about every month more New Zealand LiDAR data enters the public domain? Maybe you are one of the hundreds of users accessing this great national resource every month. Most of the main population centres are already covered and within a few years there will be LiDAR available across about 80 per cent of the country.

The LINZ National Elevation Programme provides LiDAR-based elevation products as open data. This data provides significant value to both the public and private sectors for applications including land management, natural hazards, climate change, 3D visualisation, surveying, engineering, construction, communications, archaeology, etc. See *www.linz.govt.nz/data/linz-data/elevation-data* for additional information and access to the data. ●



Digital elevation models and point clouds are available in a nationally consistent format for the areas in green. The orange areas are work in progress, and the cross-hatched areas are large regional scale projects enabled through the Provincial Growth Fund.

STONEX

All New S900A GNSS Receiver

4G MODEM
S900A has an internal 4G modem, a fast internet connection is guaranteed.

MULTI CONSTELLATION
The Stonex S900A with its 800 channels, provides an excellent on-board, real time navigation solution with high accuracy. All GNSS signals (GPS, GLONASS, BEIDOU, GALILEO, QZSS and IRNSS) are included.

INTELLIGENT BATTERIES
The dual slot, for two Smart, hot-swappable batteries, gives you up to 12 hours battery life. The power level can be checked and seen on the controller or directly on a the LED bar on the battery.

E-BUBBLE & IMU - 60°
In the software, the E-Bubble indicates if the pole is vertical and the point will be recorded automatically when the pole is levelled. The optional Inertial Measurement Unit (IMU) technology provides up to 60° inclination.

MADE IN ITALY

TRIG INSTRUMENTS

www.trig.nz
0800 500 460

Critchlow Geospatial receives government co-funding to build free-to-air website for EV fleet cost-benefit evaluation

Critchlow Geospatial announced today that it has received up to $210,000 of government co-funding in Round 8 of the Low Emission Vehicles Contestable Fund, administered by the Energy Efficiency & Conservation Authority | Te Tari Tiaki Pūngao (EECA) to build a free-to-air website for fleet operators that are considering switching to electric vans and trucks (EVs).

The website, Smart Routing LEV powered by NationalMap, will provide operational cost comparisons for their specific business and geographic scope.

Group Managing Director Steve Critchlow says that this is a great endorsement of the value that route optimisation can provide to businesses looking to improve their fleet's green credentials.

"This co-funding will enable us to deliver credible cost forecasts to New Zealand transport businesses. We haven't seen anything like this anywhere else. It's possibly a world first."

Critchlow Geospatial has a history of delivering route optimisation solutions for transport businesses in New Zealand and Australia. The project team includes US EV energy modelling and European route optimisation experts. Steve Critchlow is particularly excited that the Wellington-based team will have this opportunity to build on our current smart routing solutions by adding EV factors and providing free website access.

"We have delivered route optimisation solutions for large and small businesses in New Zealand and Australia for many years. What we are doing is a real game-changer. A New Zealand study (Ispos, 2018) showed that 51 percent of participants did not know how EV and traditional running and maintenance costs compared. We're going to change that. We are going to enable fleet operators to compare costs of using various fleet sizes and vehicle configurations. The NationalMap 3D transport network allows us to consider the changing terrain, and the route optimisation algorithms will recognise dynamic vehicle loadings throughout the route to predict EV energy use. Then we'll add the fixed EV ownership costs to compare against the current operational costs."

This cost-benefit demonstration system for commercial fleet operators could be the catalyst to give New Zealand businesses the confidence to switch to EV fleets, reducing greenhouse gas emissions.

Critchlow Geospatial is aiming to publish the website in January 2021.

"A New Zealand study (Ispos, 2018) showed that 51 percent of participants did not know how EV and traditional running and maintenance costs compared. We're going to change that."

Cadastral Stream News

At this time of writing, we hopefully will be in a position soon where restrictions on gatherings are to be relaxed a bit more.

Feedback from our members has been really varied regarding the impact on business. Some have adapted quickly while for others the uncertainty has been significant, with tough decisions being made.

From a Cadastral Stream point of view, work continues still. It's very disappointing that the conference has been impacted, however, it does give a longer lead-in time for the next conference to ensure the presenters and topics are the best they can be.

Hopefully, come conference time next year, we have got on top of this pandemic worldwide and we can network together in person.

There are a few other projects on the go where we have representatives on several groups. These range from consulting on STEP, tertiary reviews to QA standards and providing general input to assist National Office staff.

Kia kaha and stay safe.

Toni Hill
Cadastral Stream Chair

Hydrographic Stream News

This past quarter LINZ have accepted the final deliverables for the Western Marlborough Sounds Hydrographic Survey. The project was the second survey partnership between LINZ and Marlborough District Council (MDC) and delivered by contractors iXBlue and DML. Data captured throughout Pelorus Sound / Te Hoiere, Admiralty Bay, and Te Aumiti / French Pass areas will be used to update navigational charts for the many commercial and recreational mariners who operate in the region. Additional science data collected will inform environmental management of the sounds, and support MDC and local iwi to make informed decisions around resource management and marine biodiversity.

Given the ongoing uncertainty around COVID-19 disruptions, LINZ has rescheduled this year's hydrographic survey plan. Surveys that were scheduled in the Banks Peninsula and Bluff have been deferred, and instead surveys of the Coromandel and Approaches to Taranaki will take place. This was a strategic decision to manage and minimise the risk of COVID-19 related service disruption. Set-to work is underway in the Coromandel and the Taranaki survey will commence during the summer.

This October the S+SNZ virtual webinar series will feature a session titled "Challenges in Collecting & Processing Data in the +10m to -10m Zone". The session will run between 1pm and 2pm on October 14 and look at non-traditional methods of capturing data in the littoral zone. Kevin Smith of DML will provide an insight into Discovery Marine's experience undertaking a multidisciplinary survey of White Island as part of the larger LINZ East Cape Hydrographic Survey. The survey included the use of vessel mounted LiDAR to capture topographic data on coastline features around White Island. Paula Gentle and Bradly Cooper from LINZ will discuss a recent pilot project to test an innovative approach to data capture in the coastal area using Unmanned Aerial Vehicle (UAV) technology. Two areas were selected in Northland that presented environmental challenges to fully test the approach. Different UAV platforms and methodologies were used at each location, with a specification to map elevations (heights and depths) approximately 50m inland and out to a water depth of 3m.

HPS Team

Positioning and Measurement Stream News

The P&M Stream is currently running a survey of its members to learn what the stream leadership team needs to focus on and deliver to our members for the next two years.

The following 15 items were each to be rated as:

Not Interested/not relevant	Not currently important to me	Important but not a priority	A priority and I actively seek more information	High priority and I would pay for seminars

1. BIM (building information management)
2. UAVs (data capture tools and techniques)
3. ROV (remotely operated vehicle) and robotics
4. Reality capture (scanning/mobile mapping)
5. Managing big data (storage/archiving/retrieval)
6. Augmented reality and virtual reality
7. Machine learning and artificial intelligence (how it relates to survey capture and process techniques)
8. Smart cities (understanding what it is and its relationship to Survey & Spatial)

(continued p44)

Boundary walls or wrongly placed structures?

Mick Strack

I have had occasion recently to find myself disappointed that the expertise of surveyors is not brought forward in our courts. It seems surveyors, who have exclusive and statutory responsibility to identify and depict boundaries, are often engaged to measure and prepare plans of ground features, but not for their professional expertise on boundary legality matters.

The following case commentary illustrates this. I question some decisions – not to criticise the judges – but to suggest surveyors could have brought different arguments to the dispute.

Barry Park Investments Ltd v Johnson [2019] NZCA 686

This case arose because a stone wall apparently encroached into, and limited access along, a 3.05m-wide accessway to a rear lot. The plaintiffs (the owners of the access strip and the back lot, No 24) sought relief for the wrongly placed structure, for nuisance and for trespass, seeking an injunction to remove the encroachment or damages for diminution of value.

The first survey of subdivision occurred in the 1880s. Sometime around that time, a stone wall was built along the north/south boundary which also retained a built-up level surface of the defendant's lot (No 22) upon which a house was built.

It appears the wall served as the boundary structure for many decades. A subdivision survey of the western parcels in 1957 created the 3.05m-wide accessway to a back lot immediately adjoining the walled boundary. That survey showed *'Stone wall genly on bdy'* and then partly as *'Retaining wall'*.

At the northern end, the roadside peg was placed at the base of stone wall with an offset of 0.24 from the boundary. At the southern end of the accessway, the width to the base of the stone wall is shown as 2.46m (or 0.59m to the boundary). The wall is likely to be up to 1m wide at the base. This suggests the wall straddles the boundary as you would expect it to.

Various fact issues are worth emphasising:

Photo: Lucy Strack

- A dry stone wall must necessarily, by its design, require a significantly wide base straddling the boundary.
- The width of any boundary feature must necessarily mean that full-width clear and unrestricted use up to the boundary is not available.
- The wall has been in place for at least 130 years – we have no knowledge about who built the wall, but we can assume it was built to identify the common boundary.
- The wall has been placed and accepted without dispute or conflict, and consent by all parties is implied by 130 years of existence.

Wrongly placed structures

If the wall is determined to be a structure, then it can be dealt with through the Property Law Act as a wrongly placed structure.

The 1952 Property Law Act provided a remedy for encroachments – allowing for title to the land encroached upon to be vested in the encroaching owner (s129 (2) (a)), or an easement to be granted over the encroached upon land (s129 (2)(b)), or the court may grant the right to retain possession of the structure (s129 (2) (c)). There is no evidence of any mistake or uncertainty about where the boundary lies, so s129A would not apply.

The 2007 Property Law Act made similar provisions but describes encroachments as wrongly placed structures (s321). This seems to have significantly changed the effect of the Act, not just that a structure exists on the land, but that it was intended to be placed on other land. This seems to place more emphasis on where boundaries should be, rather than inadvertent and longstanding occupation.

Fence

If the wall is accepted as a 'fence', then it should have been dealt with under the Fencing Act. Specifically the court could have determined 'the line of fence to be adopted, and the amount of compensation (if any) to be paid for loss of occupation of land and the manner of payment thereof' (s24 (1) (f)).

Although the Fencing Act 1978 states that a fence may not encroach 'to any degree whatever' (s8), by definition, all fences, being three-dimensional structures built on the boundary, must encroach.

The definition of a fence (s2, Fencing Act 1978) supports the determination that the wall is a fence – it 'separates the lands of adjoining occupiers', and the list of adequate urban fences (Schedule 2 (5)) includes a stone wall. It is both a reasonable inference of public observation, and in this case, identified by the 1957 survey as a boundary fence/wall.

There was no discussion of the fact that any boundary feature must necessarily straddle and partially encroach on each side of the boundary. However, the court accepted the plaintiff's submission that it was not a fence.

The court stated that 'it is not what was in the mind of the builder but rather what was the evident purpose of the construction' (HC para [38]). The court also decided that the wall was 'more likely' built without the positive consent of the owner of No 24.

I suggest that the wall is a fence built generally on the boundary where it was intended, which encroaches over both sides of the boundary. It seems to me that the evident purpose is as a boundary division (a fence), notwithstanding the fact that in part (less than half the length), it also serves as a retaining wall – there is nothing remarkable about a wall serving both functions. I also suggest that 130 years of undisputed acceptance of the wall position amounts to implied consent.

House on the boundary

A problem with the position and/or the moving of the wall is that the house on No 22 is supported on the wall. Any removal will require propping up of the house while a replacement wall is built clear of the boundary.

The court recorded that the house encroaches over the boundary by 7cm. That encroachment is far from conclusive, given normal survey tolerances, the age of the original survey, and the legal tolerance of a 'little more or less'. Under such circumstances, 7cm must be considered at worst, *de minimus*.

The High Court discussed how the 1957 survey 'adjusted the boundary line by 20cm to the east'. In fact, that plan identified considerable shortages (up to two links) in measurements compared with the title dimensions so the boundary was recalculated but not moved.

However, it is clear there is enough doubt about the 1880 survey, to accept that 'a little more or less' might amount to several links. The apparent precision of surveyed dimensions should not be used to make claims about minor discrepancies.

Purchaser responsibilities

Court decisions have regularly stated that buyers of land are expected to make themselves fully aware of what they are buying; where their boundaries lie and what title encumbrances or physical restrictions may limit their occupation and use.

The court was asked to take into account the fact that the owners of No 24 should have made adequate investigations about the extent of their land when they purchased it.

The court implicitly exempted them from such enquiry, also stating that No 22's owners should also have made similar enquiries about their purchase.

We do not actually know if No 22 made full enquiries back in 1979 but a quick reference to the 1957 subdivision plan would have satisfied them – it showed the stone wall (and retaining wall) generally on the boundary. In 1979 there were no web maps available for easy reference, only published documents like survey plans.

By 2012, when No 24 was purchased, an aerial photo boundary check (although not definitive) was readily available. They had every opportunity and responsibility to do due diligence on their purchase. Also, even ignoring the position of the wall, there were basalt outcrops beyond the wall which were easily observed to be obstructing access along the driveway.

A simple observation would have alerted the purchasers of compromised access. It may be assumed their purchase price reflected the limited access – further proof that they are now seeking significant enrichment by claiming unencumbered access.

The Property Law Act is remedial, and it allows for a remedy only if it is 'just and equitable'. In this situation, it would seem that the status quo is most reasonable – the wall stays, the formed driveway diverts around the very old wall and basalt outcrops. The drive encroaches over No 26, as it has always done, and everyone gets exactly what they observed when they purchased.

Of course, the subdivider of the adjoining parcels in 1957 should have observed that access was limited by the wall (and by the basalt outcrops) and allowed for a much wider access strip.

Alternative arguments

The issue of the obstruction of the accessway arose specifically because of the 1957 subdivision which created the back lot and the access strip. While that plan showed the wall as generally on the boundary, it also showed that the base of the wall was 24cm over the boundary at the front and 59cm over the boundary at the end of the access strip.

Any 'encroachment' therefore was well notified. The fact the driveway was subsequently formed partly over the boundary with No 26 suggests the driveway is the misplaced structure. No 24 could have sought relief in the form of an easement over the small strip of land of No 26.

Alternatively, No 22 could have applied for relief on the basis that the wall is a wrongly placed structure. From 1885 till the 1957 subdivision, the wall acted as the boundary structure. The western lot was barely affected by the position of the wall. The concern about the wall was created by the 1957 subdivision and the creation of the narrow (3.05m) accessway to No 24. The house on No 24 appears always to have been accessed satisfactorily and there were no complaints for another 55 years.

There is a long history of undisputed occupation and use. Relief could have been gained by No 22 for their wrongly placed wall in either of the three ways available (issuing title to the strip of land occupied by the wall, creating an easement over it, or by retaining possession over it).

Alternatively, the inability to reasonably (reasonable access by car) pass over the accessway without encroaching on other land might suggest that No 24 became landlocked, or was created as a landlocked parcel as there has always been inadequate useable width within the access strip.

Then the court would have investigated how the land became landlocked, and the relative hardships of all parties, and made a separate decision about whether to provide relief. This wall has not caused hardships in the past, so any remedy should not create hardships now (by an order to remove the wall).

All the arguments in favour of relief being granted to No 24 are based on the position and utility of the driveway. The only hardship to No 24 is the inability to profit from future development potential and that has never been guaranteed.

The decision

The courts determined the wall was a retaining wall and not a fence and that the wall was intended to be built wholly within No 22, and therefore constructed on the wrong lot.

The High Court ordered the removal of the retaining wall, predominantly at the expense of No 22.

The Court of Appeal confirmed the conclusion that the wall was a wrongly placed structure, but more fairly provided for a share of costs of removal and reinstatement.

The remedy suggested was that all the replacement wall should be built within the boundary of No 22, so that the full 3.05m would be available for the driveway. This seems to me to be unreasonable. In residential situations where fences are the norm, a boundary feature (fence or wall) will always encroach, and the full extent of a title cannot always be used. The wall should be built along the boundary line, not to one side of it.

It seems to me that we, as surveyors, continue to place too much trust in boundary dimensions rather than boundary features, and courts are easily persuaded to follow. We should at least favourably consider acceptance of the status quo and longstanding possession.

Changes afoot in the Education sector

University of Otago Te Whare Wānanga o Otāgo New Zealand | School of Surveying *Te Kura Kairūri*

Richard Hemi

Haere mai te Pūkenga.

In 2019 the government initiated a wide-ranging review of Vocational Education and Training programmes in New Zealand. To quote the Tertiary Education Commission (TEC) website: *"The Government is creating a strong, unified, sustainable system for all vocational education that is fit for the future of work and delivers the skills that learners, employers and communities need to thrive."*

By April of this year, the reform had managed to bring together all 16 New Zealand Polytechnics and Institutes of Technology into one state-owned and state-run umbrella organisation – the New Zealand Institute of Skills and Technology (NZIST). In September, Minister of Education Chris Hipkins announced a new name for this organisation – Te Pūkenga. Current providers of the NZ Diploma of Surveying, Unitec in Auckland, and Toi-Ohomai based in the Bay of Plenty, now sit under the authority of this institute.

While this is a significant step forward, there is still some way to go in the review process. The final outcomes of this new model of vocational education, and ultimately surveying and spatial polytechnic training, is still to be determined. Furthermore, the effects that the Covid-19 pandemic have had on business, education and the economy might be expected to have slowed progress and hinder advances in the review. However, it could be suggested that elements of the review process have actually been enhanced and accelerated by effects of the pandemic in NZ.

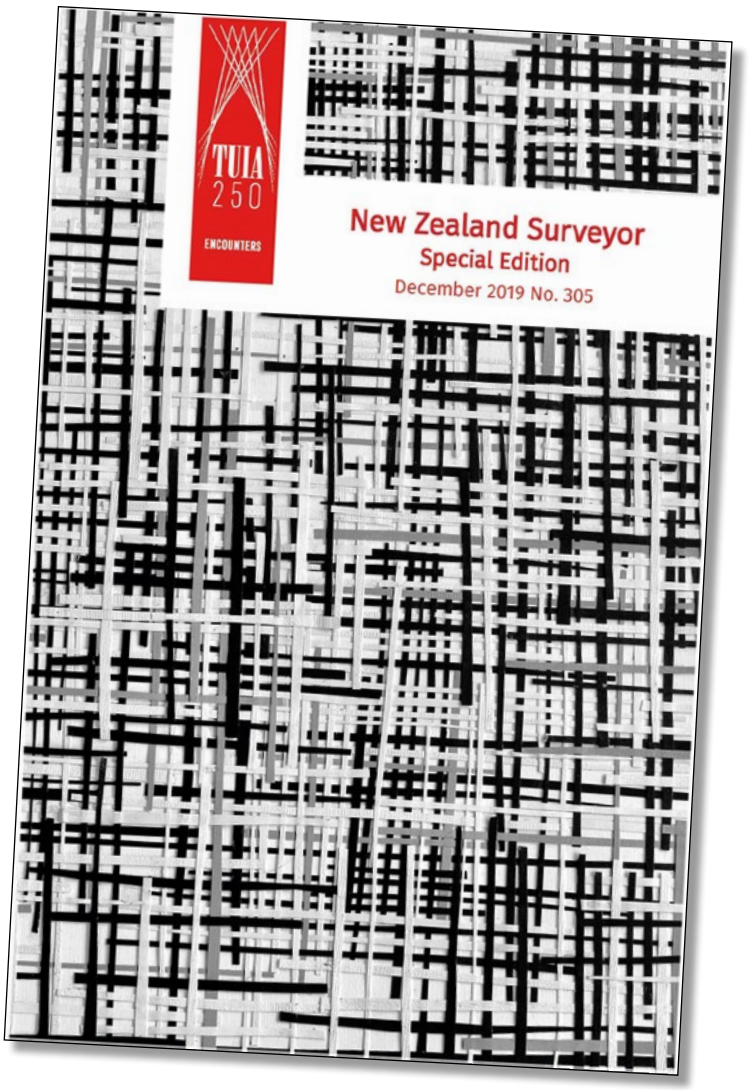
Part of the review process involves the creation of six Workforce Development Councils (WDC) representing various industry sectors with Surveying and Spatial sitting under the 'Construction and Infrastructure' council. According to the TEC: *"...they will set a vision for the workforce and influence the vocational education and training system"*. In May of this year, post the country's first lockdown, it was announced that the formation of these councils would be fast-tracked with a target date of the end of 2020, approximately six months earlier than first intended.

By April of this year, the reform had managed to bring together all 16 New Zealand Polytechnics and Institutes of Technology into one state-owned and state-run umbrella organisation – the New Zealand Institute of Skills and Technology (NZIST).

Another outcome post-lockdown was the establishment from 1 July of the Targeted Training and Apprenticeship Fund (TTAF) offering free fees for specific courses – including the New Zealand Diploma of Surveying. While the scheme will only continue until the end of 2022, it has had an immediate and positive effect on expected enrolments in both Unitec and Toi-Ohomai. Both providers have reported an increase in enquiries and likely enrolments for 2021. Unfortunately the scheme does not include the lower level, Certificate in Surveying.

Further on the negative side, this year has also seen Connexis, the industry's original provider of distance based learning of the surveying diploma, withdraw as a supplier of this course. Connexis does however continue to offer the New Zealand Certificate in Surveying (a one year Level 4 course) and the Certificate in Hydrographic Surveying (also one year and Level 4). Most of the students that were mid-way through their diploma with this organisation have been accepted into the Toi-Ohomai distance learning programme and have been able to continue their studies. The Toi-Ohomai program now has a waiting list for 2021 enrolment, but it is expected that this pressure will be relieved by the recent appointment of another staff member. While this is a positive, there may still be some

(continued on p44)



New Zealand Surveyor

December 2019 – No. 305

Gordon Andreassand

Below is a review of this recent publication which provides excellent coverage in six essays (my term for the articles) dealing with the Tuia 250 theme. This project covers the development in Aotearoa of the Tuia concept of "weaving people together for a shared future".

The editorial by Peter Knight, entitled *Relaxing the Scientific Paradigm*, outlines Tuia 250 – the 250 years since Captain James Cook arrived in New Zealand waters in 1769, and provides a good background to the evolution of a joint nurturing of the country's development.

History indicates that the initial reaction between the Europeans and Pacific natives, and Māori and Pākehā in Aotearoa, often shows Pakeha in a very poor light. So, let's see what the writers of the six essays in the book have to say on this matter.

First Contacts in the South Pacific: Cook and Tupaia

This first essay by Mick Strack sets the theme for the study of Cook's voyages to New Zealand, and discusses the assistance of Tupaia, a native from Tahiti, who was skilled in seamanship and navigation.

From mid-1769, he sailed in the HMS Endeavour as a supernumerary under the charge of Joseph Banks but died of a sickness in Batavia in 1770 before the ship returned to Plymouth.

Tupaia played an important part in cementing good relations with Māori in Aotearoa and assisted Cook in translating South Pacific place names for the maps and charts drawn on that voyage.

Those of us who enjoyed lessons dealing with New Zealand history at school learnt much about the Endeavour, Cook and Banks, but never heard a word about Tupaia. Mick Strack's essay will help give a better picture of Cook's achievements, and the part played by Tupaia.

David Goodwin is the author of the second essay, ***European and Polynesian Star Navigation: More Than a Matter of Degree***.

He makes a comparison and notes the differences between early European navigation and Polynesian navigation methods used at the time of Cook's first voyage to Tahiti and the South Pacific 250 years ago.

The technicalities of determining latitude by zenith stars are discussed and other navigational methods

involving known stars movement in the sky are covered.

He notes that European navigations had access to star charts and other information, while the Polynesian voyagers had to memorise a vast range of star data to assist their navigation.

This essay covers some fairly technical topics but will be of interest to all navigators who make long-distance ocean voyages.

Knowing Your Place – Indigenous Knowledge and Spatial Mapping

The third essay, prepared by Dr Lyn Carter, discusses the historical naming of places and features in Aotearoa before the arrival of Cook.

With the arrival of settlers in New Zealand, mainly from Great Britain, place names for areas of settlement often followed the names of similar locations in Great Britain. No thought was given at that time to the historical Māori names steeped in ancestral beliefs and concepts.

Once Cook began putting names on maps and charts, efforts were made to use a name in English script that matched the sound of the Māori name. There was no effort made to check how that Māori name may have arisen. Studies such as that carried out by Dr Carter will help to rectify this, and corrections should be made.

Cook: Our Professional Ancestor

This fourth essay was prepared by Emily J. Tidey, Kara M. Jurgens, and Jean-Louis B. Morrison.

From what they have written, it would appear that they are involved in hydrographic work, hence the reference to (their professional ancestor) Cook, who 250 years before had carried out the hydrographic survey of the coastline of Aotearoa.

Their findings are partly based on responses to a nationwide questionnaire sent to respondents working in the hydrographic field. From those replies, they have prepared charts of their working activities, conditions, and the equipment they used.

The five most common words used to describe hydrography were: 'interesting', 'challenging', 'exciting', 'rewarding', and 'adventurous'.

I am sure that Cook and his small band of hydrographers had similar feelings towards their work 250 years ago. The authors suggest there should be more public awareness of the hydrographic profession, and I believe national and international requirements will ensure a steady growth within that profession.

Cultural Aspects of Māori Geographical Naming in New Zealand

The fifth essay was prepared by Mark Dyer and Wendy Shaw, and deals with the cultural origins of Maori geographical naming. To a certain degree, their work complements that of Dr Carter in the third essay, but they have dealt with the history of the Polynesian migration to Aotearoa circa 1300-1400 CE, taking note of oral history and songs that tell of migration and settlement.

Early records maintained by European settlers sometimes omitted Māori geographic names. However, following the Treaty of Waitangi, it became essential for surveyors to work with the Māori and depend on their assistance to explore and map the land.

Then in 1874, the Colonial Secretary gave instructions to surveyors to ensure correct nomenclature was given to accurate native names. This requirement has been expanded over the years, and many of the original adopted names have been amended.

An example I am aware of is Wanganui. The river of that name, which I canoed several times in the 1950s now has the spelling Whanganui.

Dealing with place names in Aotearoa is an ongoing process, and this essay goes a long way to put that process into perspective.

Charting Our History

The sixth essay follows on from the fourth essay, and was prepared by the same three authors.

The essay celebrates the work of our 'professional ancestors'. Their contribution includes some excellent examples of the early charts produced 250 years ago, and includes recent charting products such as the 2016 bathymetric survey of Queen Charlotte Sound.

My only regret is that the small format of the book does not give full justice to the reproduced charts – where the original is often quite large.

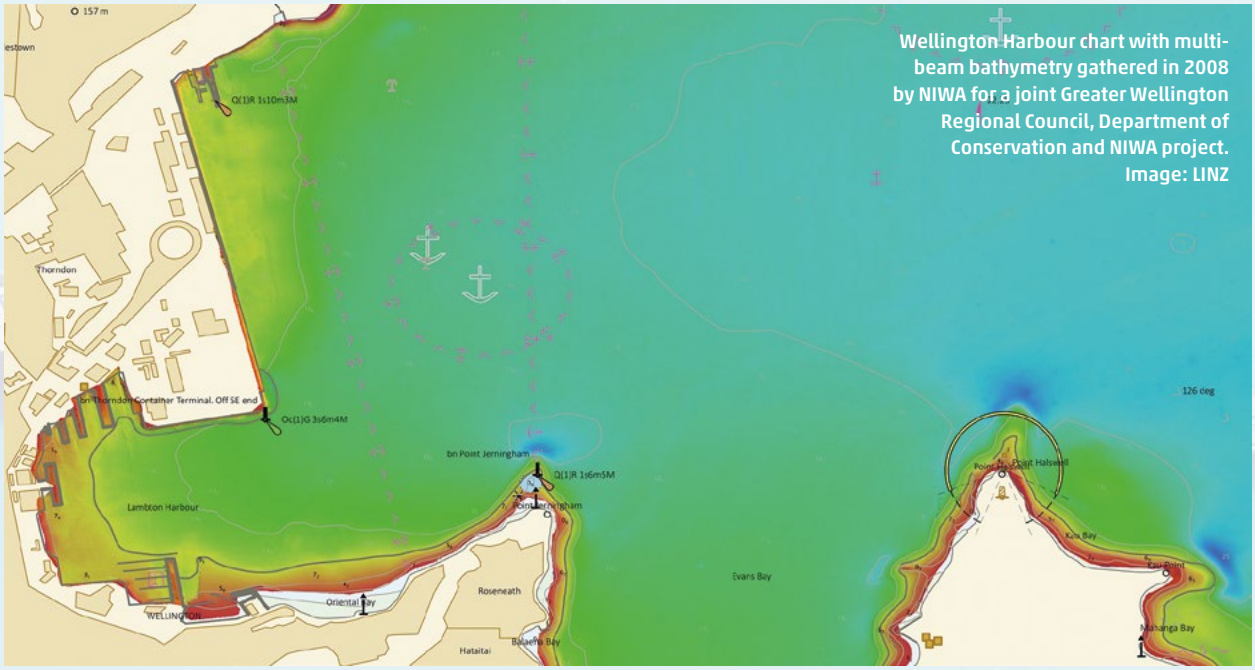
However, this is a well-written presentation which gives due recognition of the ongoing development in the field of hydrography.

From Aotearoa's introduction to hydrography 250 years ago under the care of Captain Cook, one of Great Britain's most famous hydrographers, the country continues to make excellent progress in this field.

With the assistance of the International Hydrographic Organisation in Monaco, and with the support of various UN organisations, New Zealand is on the right course to meet all its hydrographic requirements.

Postscript: Issue 305 of the *NZ Surveyor* Journal is available electronically at *https://www.surveyspatialnz.org/members/Publications/nz_surveyor_journal* ●

Gordon Andreassend, FNZIS



Wellington Harbour chart with multi-beam bathymetry gathered in 2008 by NIWA for a joint Greater Wellington Regional Council, Department of Conservation and NIWA project. Image: LINZ

Good Practice Guidelines for Hydrographic Surveys in New Zealand Ports and Harbours

Stuart Caie, Manager Hydrographic Survey, LINZ

Land Information New Zealand and Maritime NZ recently worked together to review, consult with stakeholders, and publish a new edition of the *Good Practice Guidelines for Hydrographic Surveys in New Zealand Ports and Harbours*. Stuart Caie reflects on the methodology for the review and publication process.

Background

In 2016 Maritime NZ published an updated version of the New Zealand Port and Harbour Marine Safety Code, 2016 (the Code). The Code is intended to help port operators and councils manage the safety of marine activities in their ports and harbours by providing a voluntary national standard to support national and local legislation. The objective of the Code is to ensure the safe management of ships navigating in New Zealand ports and harbours.

The Code is supported by a number of guidelines of good practice, a significant one being *Good Practice Guidelines for Hydrographic Surveys in New Zealand Ports and Harbours*. During the implementation of the Code, a review of the supporting guidelines was identified as a key project to ensure they continue to support the Code effectively. As such, LINZ and Maritime NZ worked together to review the guideline, first published in 2004. The primary objective was to create a guideline which reflects current good practice in hydrographic surveying, in consultation with key stakeholders.

The 2004 guideline was considered technical and predominantly aimed at the hydrographic surveyor. It mainly dealt with the survey technologies and methodologies of the time and the use of single beam echo sounders. LINZ and Maritime NZ wanted a change in focus, and to direct the guideline to an audience that covered the strategic, operational and tactical facets of managing and operating a port in line with the Code.

The intention of the new guideline is to inform and support all those involved in decision-making processes for planning, contracting, specifying and conducting hydrographic surveys in New Zealand ports and harbours.

The review process

The review, led by LINZ, began in November 2018. Working with Maritime NZ to identify stakeholders, the project team developed a questionnaire to focus stakeholder engagement. The questions were intended to be used as a guide for a series of interviews with ports, council and iwi to better understand the purpose and type of hydrographic surveying in their jurisdiction; and whether the 2004 guidelines were appropriate and relevant.

Interviews were held with representatives from councils, port companies, harbourmasters, pilots, iwi and the hydrographic surveying profession, including members of the S+SNZ Hydrographic Professional Stream. Organisations contacted were: Te Ātiawa o te Waka-a-Māui; Northland Regional Council and Northport; Auckland Transport and Ports of Auckland Ltd; Bay of Plenty Regional Council and Port of Tauranga; Taranaki Regional Council and Port Taranaki; Wellington Regional Council and CentrePort; Marlborough District Council and Port Marlborough; Environment Canterbury and Lyttelton Port Company; Otago Regional Council and Port Otago; Environment Southland and South Port; NZ Marine Pilots Association; and S+SNZ.

The main themes that came out of the consultation were:

- The focus of guidance should be on senior personnel in councils and port companies, i.e. those responsible for decisions around hydrographic survey.
- The guidance should:
  - describe the benefits of hydrographic surveying
  - use simpler, less technical language
  - reflect the current move to larger ships, tighter tolerances, reduced under keel clearance and multi-beam becoming the technology of choice
  - reflect the need for more rigour around professional certification of surveyors
  - have a wider focus than just navigational safety of large vessels
  - reflect opportunities for high-density bathymetric electronic charts and official HD ENCs
  - provide information on data accuracy requirements to achieve quality standards.
- Full seabed coverage is important
- A need for better understanding of the specification process
- A need for specifications to be better documented.

A stocktake of international good practice was also undertaken, although it was soon realised that there are no clear comparisons of similar documents. The documents reviewed are listed at the end of this article.

Peer review

Based on the interviews and review of international good practice, a new guideline was drafted in June 2019 and peer reviewed.

The new guidelines are in three parts:

- Part 1: Overview for **councils and port operators** who are responsible for navigational safety of New Zealand ports and harbours
- Part 2: Guidance for **harbourmasters, port engineers and surveyors** who are responsible for managing surveys
- Part 3: Guidance for **hydrographic surveyors** who provide hydrographic survey services to councils and port operators.

Part 1 reiterates the responsibilities of the port operator and council under the Code. Both have an obligation to ensure a safety management system (SMS) is in place which includes the requirement to carry out hydrographic surveys to support the safe operation of the port and harbour. The Code emphasises that accurate hydrographic information is essential for safe navigation and that there should be a clear policy on hydrography, which should be part of the SMS.

As larger vessels are visiting New Zealand ports, there is now more than ever a need to ensure modern nautical charts are available and maintained to enable safe navigation. The manoeuvrability of large ships within the confined waters of a port are challenging the limits of a port's capacity to accommodate them. Accurate measurement and comprehensive coverage of the seabed through high-quality hydrographic surveys underpins the safe operation of every port and harbour in New Zealand. To achieve this, multi-beam echo sounder systems are now the preferred technology.

Part 2 provides an overview of hydrographic survey standards and details the different levels of survey standards, depth accuracy and data quality indicators. There is also a focus on the importance of using suitably qualified, experienced and competent personnel, in particular the hydrographic surveyor in charge. A qualification alone is insufficient to demonstrate a hydrographic surveyor's competence. It must be followed up by practical experience that shows the surveyor can put their knowledge into practice. Professional certification through the Australasian Hydrographic Surveyors Certification Panel (AHSCP) provides a formal and comprehensive method of demonstrating the combination of qualifications and experience.

Napier Port. Photo: Maritime NZ

Part 2 also introduces the concept of a method statement as presented in the Ports Australia document, *Principles for Gathering and Processing Hydrographic Information in Australian Ports, 2012*. The method statement should detail how a survey will be carried out and, specifically, how the hydrographic surveyor will ensure the data meets the required standard.

And finally, Part 3, aimed at the hydrographic surveying professional, provides more detail on the method statement and the type of metadata required to support the survey deliverables.

Consultation and publication

In November 2019, the redrafted guideline was circulated to a reference group for consultation after a plain English review. The group comprised harbourmasters, port operations managers, pilots and hydrographic surveyors. Feedback from the reference group was reviewed and actioned as appropriate.

The final step was to consult with the wider stakeholder group. This was led by Maritime NZ and carried out over six weeks in February and March 2020. Using an online form, respondents were asked targeted questions and given the opportunity to provide further comments. The feedback from the online consultation and that received by email was reviewed and the final version of the guidelines drafted and published on the Maritime NZ website on May 12, 2020, after a further plain English review.

The response from the ports and councils has been positive with many stating it is well written, easy to read and a vast improvement on the previous version. It provides valuable information to those who need to understand the various issues around hydrographic surveying and good survey techniques.

LINZ and Maritime NZ believe the intention of the guideline, defined at the beginning of the review, has been achieved. Those involved in decision-making processes for planning, contracting, specifying and conducting hydrographic surveys in New Zealand ports and harbours now have the guidelines to inform and support them.

LINZ and Maritime NZ would like to thank all those involved in the review, providing valuable feedback and comments.

Good Practice Guidelines for Hydrographic Surveys in New Zealand Ports and Harbours is available on the Maritime NZ website *www.maritimenz.govt.nz/commercial/ports-and-harbours/port-and-harbour-safety-code.asp#guidelines*.

Documents included in the stocktake of international good practice:

1. Standards for Hydrographic Surveys within Queensland Waters, Maritime Safety Queensland, February 2009
2. Ports Australia, Principles for gathering and processing hydrographic information in Australian ports (version 1.5, November 2012)
3. Seafarers Handbook for Australian Waters, AHP20, Supplement: Mariner's Guide to Accuracy of Depth Information in ENC, Australian Hydrographic Office, 2018
4. International Hydrographic Organization (IHO) Publication S-65, Annex A, High Density (HD) ENC Production and Maintenance Guidance, Edition 1.0.0, January 2020
5. Port Marine Safety Code, For all UK Harbour Authorities and other marine facilities, berths and terminals, Maritime & Coastguard Agency, November 2016
6. A Guide to Good Practice on Port Marine Operations, Maritime & Coastguard Agency, February 2018
7. Harbour Master's guide to hydrographic and maritime information exchange, United Kingdom Hydrographic Office, version 3, May 2016
8. UK Civil Hydrography Programme, Survey Specifications, Civil Hydrography Services in European Waters, March 2016. ●

(continued from p34)

9. Detection (underground asset location)
10. Open data standards (data integration)
11. Best practice implementation of official NZ coordinate systems and datums
12. GNSS (new options including PPP-multi constellation – L5)
13. Workflow optimisation and data interfaces (field to office to client)
14. Leveraging the free public LiDAR (how to improve, and create new, deliverables from LiDAR)
15. Other suggestions (open-ended question)

The clear leader currently is Q13 on workflow optimisation, followed by Q12 (GNSS) and Q11(datums).

If you have not filled in the questionnaire, please do so – or email me your responses to the questions as I am always keen to hear from you and deliver what you need.

Bruce Robinson
Stream Chair
bruce@globalsurvey.co.nz

(continued from p38)

concern at the shortage of places for keen surveying candidates, particular in centres outside of Auckland and Tauranga.

And in the same year, the New Zealand Qualifications Authority (NZQA) has instigated a qualification review of the New Zealand Diploma in Surveying with the process intended to be completed by 31 December this year. The New Zealand Diploma has taken over from the earlier 'National' Diploma and has its course content described not by detailed Unit Standards as was the case previously, but by a broadly focused 'Graduate Profile' that succinctly describes those things that a graduate will be able to do. I would encourage readers to look at the NZQA qualification description for the New Zealand Diploma in Surveying – *https://www.nzqa.govt.nz/nzqf/search/displayQualificationOverViewWidgetJS.do?&selectedItemKey=2959*

Surveying and Spatial NZ would welcome any comments or thoughts on the review of the diploma qualification and a number of members have already been involved in consultation groups working on this issue.

This is an opportune moment for surveying businesses to ask what it is that they want from their diploma trained employees. Traditionally the 'technician' surveyor was trained to undertake survey fieldwork – measure, process and represent spatial data. While contemporary technology and methods of data capture have expanded, is the Diploma fundamentally fit for purpose? Do companies expect more, or a broader range of skills from their diploma trained graduates?

While the graduate profile offers the provider's flexibility and the ability to fashion the training to a students' employment and work experience, it may create uncertainty and ambiguity as to the consistency of training and the standards of competence. This also presents an issue for higher level tertiary institutions to align their programmes, and to provide a career path that is both consistent and a logical progression to more advanced studies. But regardless of these concerns, it is certainly positive for the industry to see a renewed interest and uptake in this qualification after some earlier years of concern and low numbers. ●

Tiny Surveyor Pre-Marking Robot

Mark lines from the comfort of your car!

Tiny Surveyor is a robotic pre-marker tool that will save you time, increase safety and enable you to mark out road lines automatically. With the ability to interface to any GNSS or total station for precise height measurements, the Tiny Surveyor is a versatile and reliable tool that works for eight hours on a single charge.

Key benefits:

- Up to 10 times faster than marking out on foot
- Increase safety by following the robot from a car
- Reliable, repeatable 2-3cm accuracy
- Works as hard as you do with 8 hour battery
- Versatile to accommodate different spray can sizes
- Compact, portable design makes for easy transportation
- Use with your existing GNSS and optical survey equipment
- Works with a variety of standard file formats

Get in touch today:

0800 867 000

info@positionpartners.co.nz

www.positionpartners.co.nz

New Zealand • Australia • SE Asia

Position Partners

Shaping New Dimensions

Transform Your Digital Delivery

Discover the NEW Leica Nova MS60
Intelligent MultiStation

The Ultimate All-Rounder

- 1 second total station with 3D laser scanning
- Capturing upto 30,000 points per second
- Unique AutoHeight & Dynamic Lock features
- Includes imagery and in-field data analysis

WWW.GLOBALSURVEY.CO.NZ/MS60

GLOBAL SURVEY | SURVEY & CONSTRUCTION TECHNOLOGY

0800 453 422
WWW.GLOBALSURVEY.CO.NZ

Leica Geosystems