

Measuring the ROI of geospatial at Auckland Council

Transcript from an interview with:

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Review the video at <https://vimeo.com/1164439841/be504d76df>

Hello, my name is Nathan Hazelwood and I'm the Business Consultant, practically at Eagle Technology based in Auckland, New Zealand. Firstly, before we begin, I actually worked for 10 years in the UK for the British Ministry of Defence and still have a lot of colleagues and contacts there. So if I met you during my time working in the UK, a greeting to all of my colleagues over there. We're very excited to be able to bring to you today a presentation about some work that Auckland Council has done looking at the benefits of geospatial technology for their organisation. So this is actually one of the most comprehensive assessments of geospatial technology ever undertaken anywhere in the world, to the best of our knowledge.

So we're very excited to be able to bring you some of the results of this study. We are, of course, aware that there have been some national level studies undertaken, but these tend to be at the level across an entire economy. So there's some excellent work done in the UK by the British government on the geospatial sector market report from 2024 and some other excellent studies from Australia and New Zealand. But these studies tend to be across the entire economy of a country, and so they're different to what we've done with Auckland Council, which focuses on the geospatial benefits for just one organisation. So I'm going to hand you over now to Stevo, who's going to introduce the study over to you, Stevo.

Thank you, Nathan. I'm just going to do a introduction in the indigenous language of New Zealand, which is Māori. So tēnā koutou katoa, ko Stevo Robinson tuka ingoa. Tēnā koutou, tēnā koutou, tēnā koutou katoa. Hi, everyone. My name is Stevo Robinson. I am the product owner here within Auckland Council. And just to give you a little bit of an overview of Auckland as a whole for our international audience, I'm just going to play a little bit of video to give you a bit more context around our

beautiful city. So Auckland, which is the Māori name for Auckland, is Tāmaki Makaurau.

It's indigenous name, and it's a vibrant multicultural city with a unique blend of forests, beaches, parks and urban life. Fun fact, there are around 53 volcanoes throughout the Auckland region. Don't worry, most of those volcanoes are not active. And it's one of the few cities in the world where you can actually travel from one side of the country, from the West Coast all the way over to the East Coast. And you can do that in around under 60 minutes, bearing traffic.

It's also ranked the seventh most livable city in the world in 2025, and it happens to be New Zealand's largest city. And as you can see, it's beautiful. I love living here. And I also love being able to serve the people of Auckland and Tāmaki Makaurau through Auckland Council. Just some stats on Auckland Council and some of the scale of our organisation. Auckland Council is the largest local council in Australasia, 1.65 million residents across our region.

We serve 540,000 occupied households. It is a large organisation. So there are 12,000 staff, and that includes Auckland Council, as well as some of the council-controlled organisations, which include things like Auckland Transport, which are like your buses, your trains and things like that, and Watercare, which is a lot of the water services, like your pipes and water assets, etc. There's a lot of capital investment within Auckland Council. So for 2024-2025, there was \$3.9 billion in New Zealand dollars of capital investment. And then that money and investment is spread across seven core service areas, which I'll get into in a future slide.

And as you can imagine, Auckland Council offers a lot of the services you'd expect a local government to do. So, for example, there's over 1 million households for public bins, recycling, food scraps across the region. Now, what's really important with the framework of the study that we've undertaken and the benefit report that we've done for the survey is the long-term plan. So every organisation has a strategic plan. For Auckland Council, it is the long-term plan, which is a statutory 10-year plan that basically sets out the services that Auckland Council is going to be delivering and the major investments and how that's funded. The long-term plan runs from 2024 all the way to 2034, and it's refreshed every three years.

And why it matters is it's the primary investment for decision-making framework. Within Auckland Council, it balances growth, affordability and service levels. And so earlier, I mentioned around how there are seven core areas. And so what was—you can kind of see here that they're split across transport, water, the built environment,

natural environment, economic and cultural development, community and well-managed local government. And these are like the pillars of our organisation.

And so what was really critical about the survey was to be able to tie back the results of the survey and the questions of the survey to these seven core investment areas and the long-term plan. The reason that's really important is that it's a language that our executives and sponsors understand. If we can tie the value and the results to this, it speaks in a strategic language for those executives, and it makes it a lot easier for when we're putting together things like business cases that we're able to tie it back to that long-term plan. Just a little bit around sort of how—a bit of a scale in terms of the services which Auckland Council has to offer. As you can see there, there's—this is the capital, the CapEx and OpEx spend across all of those service areas, which I mentioned earlier. And then there's lots of funding levers, as you can imagine.

So Auckland Council has things called resource consents, which is essentially permitting. We have rates, which is essentially Auckland—oh, sorry, council taxes. And so this just gives it a little bit of a scale of sort of the types of investments across the long-term plan and these key areas. And then if you look across Auckland or Tāmaki Makaurau, this just kind of shows the diversity of projects, which Auckland Council is delivering through its long-term plan. So as you can see there, it ranges from large infrastructure projects to transport— new transport hubs to new parks and water facilities.

So it's a really fantastic place to work because there's a diversity of work, and GIS plays a core role in a lot of these key areas. And as you can imagine, Auckland Council, being large, it's got a lot of different responsibilities. It's large and complex. It's thousands of staff. There's lots of internal users, external users, and there's varied responsibilities and legislative requirements that GIS plays a role in. And just to give a bit of sense of the number of GIS users across Auckland Council, there are over 3,700 users across our ArcGIS Online and Enterprise environment.

We also have a number of power GIS users out in the organisation who use ArcGIS Pro. So there are close to 200 ArcGIS Pro users within Auckland Council. So as you can imagine, Auckland Council has lots of different legislative requirements, and legislative basically being the laws that Auckland Council needs to adhere to. And so GIS plays a critical role in a lot of these bylaws to be able to meet a lot of these. And so what was really important when we were putting together this survey is that— and the framework of the survey is that being a product owner, what's really

critical to me is to be able to demonstrate the value, to be able to articulate the benefits in a business case so that we can secure funding for these large initiatives, which cost money.

And so when we were putting the survey together, it was really key that we had some goals that we wanted to be able to meet. And so some of these goals were to secure executive support by clearly articulating those benefits. We wanted to get better visibility around sort of how GIS was being— data and tools were being used, and that would then highlight some key areas for strategic growth, for future investment, or it could also identify key areas for optimisation. And what was really cool about this is it's— with a lot of GIS, teams are sort of focused on delivering projects, delivering value, but this was a really fantastic opportunity to connect with a lot of our stakeholders and enhance the engagement with the business and sit alongside teams and really understand sort of how they were using GIS and what the benefits of that were. And so this just shows a little bit of the scale of results across both internal and external users.

And so overall, there are 1,045 survey responses, which is a huge amount of engagement throughout the survey. 159 of those were from— were council staff, and 886 of those were from the general public, so from external users. And what's really key about this is of those 159 users, 100% of staff and our team rated geospatial technology or data as being essential to be able to meet or fulfil one of those regulatory laws or to be able to adhere to our long-term plan requirements. So when we were doing our external survey, what we did was we had our flagship product, which is known as GeoMaps. It's basically the tool that a lot of the internal and external users use.

It basically brings together a lot of our authoritative GIS datasets. And what we did with that is we put a pop-up on both GeoMaps and Open Data, which is our tool which a lot of our users can access. And basically, it was a little pop-up which says, hey, we're doing this survey, can you please participate in it in terms of— it will demonstrate the value and then some of the future— help with the future investment in GIS. And so GeoMaps gets around 15,000 unique visitors per week externally, which is around 40,000 sessions per week. Internally, it's around 2,500 users per week that use GeoMaps.

Open Data, that's a huge investment that Auckland Council has put in over the last few years. And a fun fact is in 2022, there were only five datasets available on Open Data. Today, there is over 235 datasets available on Open Data. So it was really key

that we had a pop-up on that as well to get the maximum engagement from our users. We also have a lot of other GIS solutions, as you can expect within Auckland Council.

So things like planning viewers, natural hazard viewers, and a lot of other specialist viewers as well. So when we're looking at the external users that we mentioned, there was two key parts. So there was, are you a professional user? So are you someone who uses, let's just say, like an engineering consultancy? Or are you using this for personal use?

So an example of personal use is that every few years, Auckland Council will do a revaluation of houses, household prices, which they call a CV, or council valuation. So some people for personal use might go on to GeoMaps or some of our other tools to sort of see what the value of their house or their neighbouring houses are. So this just focuses on those professional users. And of those 745 professional users, 74% of users said that geospatial tools and data that Auckland Council serves was essential to be able to base it for their workflows. And 17% said that was important.

So it mirrored and reflected a lot of what we were seeing with our internal users as well. What was really fascinating when we're starting to look at our external users is we also got, of those professional users, got a bit of insight in terms of who are actually using our products and what are the types of stakeholders that are using our products. It's really easy to connect and understand who our internal stakeholders are, but we don't often actually engage with who our external stakeholders are. So this was the first time that we were able to get a bit of a breakdown of the types of industries that we're leveraging our geospatial tools and products. And what's quite fascinating here is over 40% is made up of the construction industry.

So that seems like architecture, engineering, surveying, as you'd expect. But there was also some surprises here as well. I was really fascinated by the 10%, which were real estate and property management, but it's also not a surprise in the sense that GIS is at the core of location. And as you can imagine there, there's other key parts in terms of utilities, planning, government, education, et cetera. And this is really key to be able to tailor a lot of the future features and products, which we're releasing now.

Obviously, we're not gonna just release to the construction industry, but it helps us understand if we're investing in this value, if 40% of our external users are made up

of that construction industry, will they benefit from that? So that we're maximizing the value and return on investment on a lot of the core products and updates that we are releasing. One of the key parts with that survey is we want to understand what are some of the future aspirations that we have? What are some of the things that people want to see in the future? And you can kind of see here that some of the key themes are high resolution aerial imagery, historical aerial imagery, some 3D visualization and analysis.

And so this was really key for helping prioritize and put together a backlog for some of our future strategic investment. And this just puts together what those important data themes were and measures a bit of a rating of importance of those data themes for our stakeholders and users. And at the very top is aerial and satellite photography. And second, building and property information. Third, being elevation slope.

And so this, again, really helps measure and for our business cases, be able to articulate that this is what people are asking for. This is what is valuable to our stakeholders. And not only the types of industry, but it measures the amount of people who are saying that this is really critical to be able to meet either their legislation for a lot of the laws that we have to abide to, or to be able to hear to our long-term plan, or for our external stakeholders to be able to do the work that they need to do. And so of those key data requests, that then, the results of the survey, then translated into what our future backlog is gonna be. And it's helped shape up a lot of the business cases that we've needed to secure funding.

And the funding for these types of things is not small. So to be able to use the results of the survey, to be able to demonstrate the value that this is gonna deliver to our stakeholders was absolutely key to be able to secure the funding for future investment. An example of that is the 2024, 2025 aerial imagery program. Now, this was a massive undertaking. As you can imagine, the Auckland region is quite large.

And so this was to release a high resolution 2024, 2025 aerial imagery across the entire Auckland region. And so this is huge because the last time Auckland Council did an aerial imagery release was 2017. And so Auckland region is rapidly changing and evolving as any urban city in the world. And so it's really important that we've got high resolution up-to-date aerial imagery because that helps our teams reduce site visits, be able to detect change over time, see where there's unpermitted activity happening, et cetera. This was also used in the EGLE base map that was put together.

And these stats are from September, 2024. But at that time, there was close to 3.4 million views on that base map alone. Again, another key derived product that we've been able to secure funding in for, which has been off the back of this survey is near-infrared aerial imagery. And so this was quite key, particularly in the environmental sector. And so what you're seeing here is basically the redder the tree, the healthier it is.

So this is really important to our arborist team. They can see where there are unhealthy trees that look like they're dying, and they can go out and detect those really easy to reduce site visits. But it also, what you can't see on this particular slide, but we'll show on the near-infrared imagery, is if you've got ground earthworks happening, it appears as blue. And that's really key for our monitoring teams, for example, where people may have undertaken large earthwork constructions without that permitted resource consent activity to be able to undertake that. Another key thing that's been, another key strategic initiative that has gone live recently off the back of this survey is historical aerial imagery.

So this actually went live just in December in 2024. And basically what the geospatial team has released is historical aerial imagery right from the 1940s, right through to the early 2000s. And it's near regional coverage. And this was a key theme that emerged from, as we talked about earlier, from what data themes were important to our customers. And again, this was a bit of a surprise because we always tend to focus on what's next in the future in terms of things like our new aerial imagery.

But historical imagery was a very common thing, and rightly so, because this helps, for example, we learned from a lot of the responses that, for example, our contaminated sites team, they can see using historical aerial imagery. Was this horticulture before? What was the land use that was done before? Again, it's also used for a lot of our monitoring and resource consents teams who go out and basically check is the construction of these sites adhering to the laws of New Zealand. And this can be really key, for example, where a particular applicant may have reclaimed a stream or a wetland, we can use historical aerial imagery to be able to show that that was there, and that can be used for things like environmental prosecution and all kinds of areas across our organisation.

Again, this went live in December and wouldn't have been possible without this survey. Every time I do this, Nathan and I do this presentation, it was more satisfying because last time this presentation we were saying that we gave, we said that we're

going to be going live with LiDAR off the back of the survey. And it's really awesome that we've actually now gone live with the 2024 LiDAR. So again, this was across the entire Auckland region. It was high-resolute, really high-quality LiDAR point.

And that's then been really critical for a lot of our derived products, like our contours, our digital elevation models. And this was, again, one of the top three things that people have requested in this survey. And to secure this type of funding is not small. So for example, to do the entire Auckland region for LiDAR, I think it was close to \$1.2 million, New Zealand dollars to capture that. To be able to ask for that type of funding is not easy.

And so you need to have strong evidence that this is going to deliver value. This is going to help our organisation adhere to the long-term plan, and it's going to have a good return on investment. And so it's really awesome to see. We actually went live with the LiDAR coverage in December, and just a couple of weeks ago, Auckland Council in January went live with our 2024 contours, which is absolutely critical. So just to start looking now at some of the results of this survey, starting with the personnel within Auckland Council.

So this is actually a model that was created by ESRI UK, looking at things like improving quality, lowering costs, increasing capacity, the types of things which excite executives within an organisation. And you can see some of the results here, such as 84% of the Auckland Council personnel indicating that essential or important productivity gains are achieved through the use of geospatial technology. So this is something that when you put it in front of executives, they sit up and take notice. Another set of results that we gathered was around some of the key pieces of legislation. So we have a very important piece of central government legislation in New Zealand called the Resource Management Act, which is probably the key piece of legislation that defines the responsibilities of our local councils.

So 70% of the Auckland Council personnel said that geospatial technology is essential to meeting their responsibilities under that Act, with another 14% saying that it's very important. So again, these are really useful statistics to be able to present to stakeholders when thinking about investments in geospatial technology. Another method of assessing the importance of any technology is to switch it off and see who screams. I'm joking, of course. We can't do that with an enterprise system.

So instead we asked personnel what the impact would be if the geospatial tech systems were offline for any reason. We evaluated that scenario across different

criteria, such as financial losses or legal risks, or most importantly, threats to life. We also looked at the situation in terms of an immediate impact or an eventual impact. So immediate impact being if the geospatial technology was offline for a few hours, what would the impacts be in that situation? Or an eventual impact if the systems were down for several days.

So this chart indicates the results. Down the vertical axis are the different departments at Auckland Council. Then in the body of chart, the purple and red indicates major impacts. So it's not, so as you can see here, there's a lot of red and purple in this particular chart. And it's not surprising to see that the Emergency Management Office pops the list of having the strongest requirements for robust geospatial tools.

While those statistical results are important, we also gathered a lot of text commentary to support those results. And I know this is a busy site. It's impossible to read all of that text in the time that we have today. So let's zoom in and just take a look at a couple of the results. The Healthy Waters Department was one of the teams that indicated that there could be a threat to life if geospatial tools were not available.

So the Healthy Waters Department is the stormwater team. And they described a situation such as a flooding event, where if they were to need to send personnel into dangerous situations, such as underwater stormwater networks, if they sent those personnel into the wrong place, then there would be a threat to those Auckland Council personnel, which is obviously something which the Council takes incredibly seriously. And so having this evidence of the importance of geospatial technology in this scenario was something which is really important. It wasn't just myself and Nathan that were involved in the survey, and the framework of the survey. There were a team of people who helped put this together.

And I've been at Auckland Council for just coming up to six years now. And it's been a real challenge to be able to get that executive sponsorship, to be able to secure funding for a lot of our large strategic initiatives. And an example of that is our actual platform for GIS. And Nathan talked a little bit before around, if we turned it off, what would the impact be? And the existing platform that Auckland Council has, it's on-prem, it's Enterprise 10.81, which is in mature support, which poses a massive risk to the organisation.

And so in the past, we've been trying to, as a geospatial team, get executive sponsorship to be able to upgrade that platform. And that is a massive investment,

but being able to use the framework of the survey to show, if we didn't have a GIS platform at work, the GIS platform went down, what the impact was, that was really powerful and be able to secure funding. And so we're actually on a journey at the moment to upgrade our existing platform to the latest version of Enterprise, so 11.5 and then moving to a 12 hosted on the cloud. And it's a massive transformational piece which required a lot of funding, as you can imagine. And this particular survey was absolutely critical for that.

And up on screen here, you've also got a QR code to the results of the survey. And there's also a link there that you can access it. It's all externally available, publicly available. And what's really awesome was our director actually shared this survey on his LinkedIn to say like, this is the awesome work that Auckland Council has been doing in partnership with Eagle Technology and is really excited about GIS. And GIS is now, in my eyes, seen as one of the crown jewels of our organisation.

And it's really getting the recognition and value and the spotlight put on it. There's lots of comms articles that go out on our intranet site. And it's really cool to see the excitement and buzz that's happening around GIS. So thank you for the opportunity for Nathan and I presenting for this particular piece of work. It's really exciting.

Thank you very much, Steve-O and Nathan. I think this is tremendous stuff. And I can just hear your enthusiasm, which is really, really impressive. And you made the point right at the end that this is being used as a way of showing what work is being done by the council. It's often quite difficult to get those kinds of messages across in a positive way.

And it's quite clear from what you've presented here that there's a wealth of material to help you with business cases, as you've said, going on into the future. So a first question for you is how big is the GIS team? Yeah, we are one of the largest geospatial teams in New Zealand. So obviously at the moment it's scaling to be able to deliver things like our GIS replatform, but it sits around 20, between 20 and 23 people. So there are a lot of power users across the organisation in Auckland Council.

So there's another couple of hundred, 250 odd power users of geospatial who are in the different teams across the council. So if you look at the number of GIS personnel at Auckland Council or key users of geospatial technology, there's probably a few hundred. I think the key point there is that you've developed a model which is self-serve. So therefore you don't need quite as many people in that central team because you've got those power users. And that means that you're in a

position to be able to use their resources to actually do things that you wouldn't be able to do if you were actually doing all of the work yourselves.

So I think that's a key lesson. Simon, would you like to pose any questions to the guys? Yeah, I'd love to. I mean, it's fascinating. You talked, Steve-O, Nathan, about the benefits from the survey and reporting those internally to drive further investment.

And you mentioned that your, I think you said your director put it on LinkedIn. Do you do anything else to promote the great work to external audiences to, I guess, raise the profile even further? And perhaps there's an opportunity there to get different types of investment for new things which have even more benefit and release more value? Yeah, it's a great question, Simon. In addition to our director, we're within group shared services.

So within the wing within Auckland Council, basically within that, there's comms people. And we work a lot with our internal comms team to be able to publish, whether it be LinkedIn posts from the actual official Auckland Council page. So not just our director, but coming from our organisation. And to be able to get your content and a space for that to be shared is no easy feat. There's a lot of work that goes into polishing those comms, being able to demonstrate the value of those comms.

And so, yeah, we use those channels as well. We also have a lot of our team present and conferences as well. So we have a lot of people presenting at Israel user conferences or other conferences throughout New Zealand as well. So promoting the work that we're doing, it really helps as well, because a lot of the GIS community use a lot of those core datasets, right? To build their own derived products and use them in their own spaces.

And so a lot of those things combined, we're promoting a lot of the work that we do. Another key part as well is internally, we're working at what we're calling an art, which is an agile release train. So at the end of each quarter, the team will do what we call a showcase. And we invite basically anyone that wants to come within the organisation. And it's almost like a marketplace where all the different teams that will deliver within those arts, which then link to one of those investment areas will demonstrate what they've delivered that quarter.

And so we get people internally coming in and getting a live demo of a lot of the great work that we're able to deliver. And then they then pass it on to their teams,

which can then promote that as well. Right, great to hear that you have that extensive network. And I think one of the challenges that we face is trying to make this often quite technical world relevant to non-technical audiences. So one of the challenges we have is getting the message around geospatial to citizens and businesses within the area that kind of consume this data and try to understand it a bit more and get the value from it too, rather than just the internal benefits.