

## BETTER BUILDING INFORMATION

SMRT Consulting is an innovative Wellington-based consultancy at the fore of Building Information Modelling

### CASE STUDY

## Wellington City Council saves time and money with 3D building modelling

**A project to create 3D building plans for Wellington City Council's entire property portfolio has helped the Council save time and money and improved its ability to mitigate risk.**

### BACKGROUND

Wellington City Council manages a property portfolio worth hundreds of millions of dollars. This encompasses civic buildings, recreation facilities, event centres, libraries, multi-story housing blocks, individual homes, toilets and sheds.

Prior to enlisting the help of SMRT Consulting, the Council did not hold up-to-date and accurate plans to support the utilisation, maintenance and building work undertaken on its building stock. Staff accessed data using a mix of bespoke and proprietary software, excel spreadsheets, archival plans and handbooks of precious material collated by individual staff over the years.

### THE PROBLEM

Wellington City Council Facility and Asset Management information was sometimes incomplete, dated or spread across multiple documents. These fragmented records made it difficult for office staff to quickly identify important details such as building layouts, floor areas and the presence or absence of features important to tenants. This impacted their ability to be effective because vital information was not always on hand. Conducting an archival search or going to a building for a physical inspection used valuable staff time that could have been saved if fundamental details were available centrally.

**“ You couldn't easily pick up a data print out and understand what a building looked like. That was problematic when it came to identifying the locations of issues or communicating them to others. ”**

TANE DUNNE, RENEWALS PROGRAMME MANAGER, WELLINGTON CITY COUNCIL



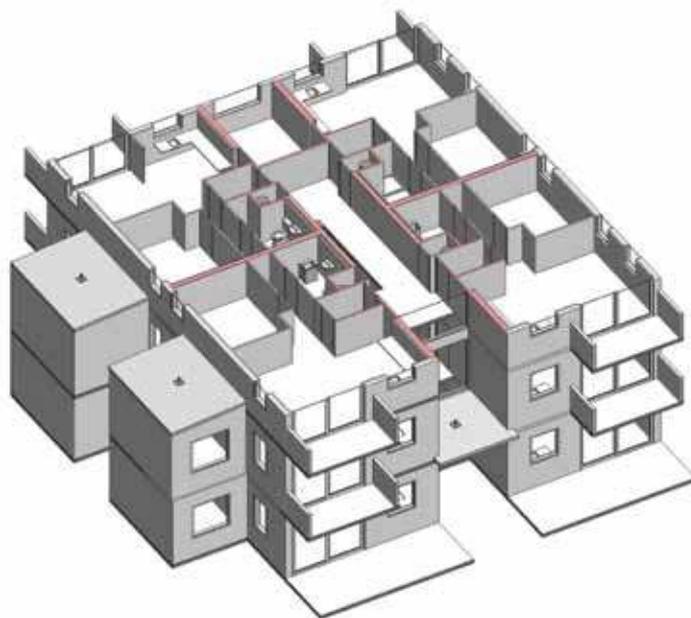
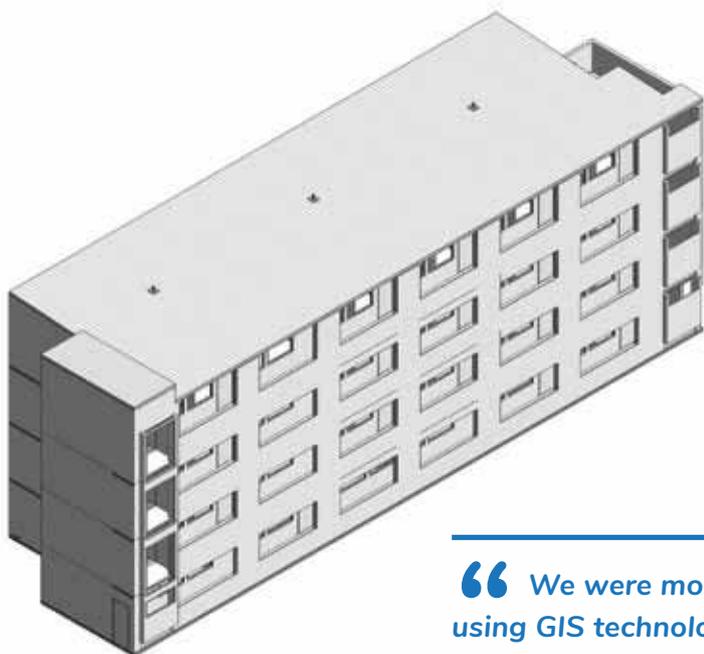
Briefing contractors about necessary repairs could also be challenging. Verbal descriptions were not always accurate enough to enable contractors to find the area they were meant to be working on, which caused delays and sometimes necessitated multiple visits to complete a job. Verifying invoices for repairs or upgrades was fraught as there was no simple way to check the accuracy of the work claimed to have been completed.

## THE SOLUTION

Wellington City Council enlisted the help of SMRT Consulting to map its buildings using a process called Building Information Modelling (BIM) to create efficient 'built asset digital models' as the source of truth for the Council's portfolio of buildings. This process uses smart technology to digitise survey plans or render buildings in a 3D format. It provides a virtual cross section of a building, floor by floor, which can be overlaid with data such as building materials, the location of fire alarms and extinguishers, and the make and model of any chattels.

The Council initially planned to have a representative sample of its buildings modelled, but through software development conducted on-site alongside the Council's team, SMRT Consulting was able to model all of the Council's portfolio, including 1,800 accommodation units and 650 other buildings, within budget.

SMRT Consulting combined data from existing archival plans and databases, 2D CAD drawings and 3D building models created by building designers for recent builds or upgrades. In instances where data was missing, SMRT Consulting and the Council arranged for physical inspections and measurements to assist with the modelling process. The result is a rich set of data for every building to input into the WCC asset management information system and a map of every building with its associated key information.



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**“ How many buildings are in there?” “All of them.”  
“That’s what we need!” ”**

EXCHANGE BETWEEN COUNCIL RESILIENCE ADVISOR MARY KANG AND RENEWALS PROGRAMME MANAGER TANE DUNNE ON THE CONTENTS OF THE MASTER BOOKLET CONTAINING ALL PROPERTY INFORMATION GUIDES.

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Once completed, the information was made available to Council staff in digital format via the Council's TROVE document management system and OneCouncil asset, finance and HR management system. The building maps, known as Property Information Guides, or PIGs, can also be printed as booklets for individual buildings or groups of buildings depending on the user's requirements.

The City Housing team produced five hardcopy sets comprised of 21 booklets which encompass the Council's 1,800 housing units. These can be taken to meetings or site visits.

A master booklet was also produced showing a complete set of all the PIGs in one hard copy document. This allows staff to quickly find the plans, floor areas and other details for any building the Council owns. A copy of this master booklet was provided to the Council's external housing maintenance service provider to ensure they have the same building layout and floor plan information as Council staff, making communication easier.

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**“ We were modelling our roading and water infrastructure in 2D using GIS technology. But in the building space you really need a vertical 3D aspect. When we began the project nobody else was really visualising their assets in 3D. Matt’s architectural background and knowledge of Revit was great. ”**

TANE DUNNE, RENEWALS PROGRAMME MANAGER, WELLINGTON CITY COUNCIL

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## THE RESULTS

The BIM project conducted by SMRT Consulting was completed in 2016, providing significant benefits to the Council.

Staff working in the Council's City Housing team are now able to quickly check the layout of a social housing unit to ensure it is suitable for different tenants, including those with specific needs (e.g. mobility impairments). They can also review and develop fitout proposals for any building using the data on the plans.

The centralised digital building models are reducing the need for time-consuming archival searches or physical inspections of buildings, and the hard copy Property Information Guides are often brought to meetings so that everyone present can see a building's layout.

Council Housing Assets Operations Manager, Ivan Burton, says the Council has saved tens of thousands of dollars of ratepayer money by having a better understanding of the layout and dimensions of its buildings. This knowledge improves decision making and allows staff to check if quotes provided by contractors are fair, based on a unit's size and the quantities of carpet, vinyl, paint or other materials a contractor has quoted for.

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**“ We can provide the Property Information Guides to contractors, so they have an accurate and complete floorplan when providing a quote. This creates a level playing field for any tender processes we run. ”**

PAUL JOHNSON, FINANCE MANAGER  
– ASSET MANAGEMENT, WELLINGTON CITY COUNCIL

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The models have also provided some unintended benefits. After Wellington suffered damage in the Kaikoura earthquake of November 2016, the Council arranged an urgent audit of many of its buildings. The BIM models made it easy for staff and contractors conducting the audit to quickly access building information and layouts, speeding up the audit significantly. They also made it possible to determine the optimum locations for accelerometer vibration sensors that were installed in 10 of the Council's most important buildings for risk management purposes post-earthquake.

Wellington City Council Renewals Programme Manager Tane Dunne says the Council is pleased with the outcome of the project and made considerable cost savings by modelling all of its buildings in one go, rather than modelling them one at a time.

SMRT Consulting stood out due to its innovative approach, its expertise using BIM software, and Director Matt Cantwell's extensive architectural background, he says.

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**“ It's great to have this at your elbow on your first day. ”**

BRENDAN JELLY, FACILITIES MAINTENANCE MANAGER, WELLINGTON CITY COUNCIL

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**“ The Property Information Guides are the single source of truth for Council buildings. They allow us to quickly view the plan and layout of every unit in our portfolio. ”**

IVAN BURTON, CITY HOUSING ASSETS OPERATIONS MANAGER,  
WELLINGTON CITY COUNCIL

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## THE FUTURE

As time goes on the Council will be able to add additional information to its BIM models to make them even more valuable. This work has already begun with the first stage of the city's well known Arlington Apartments complex added to Wellington City Council's database in digital format earlier this year. A systematic approach has been implemented within the Council's document management system to capture building alterations and other changes. These are added to the building models and included in the Property Information Guides, keeping the information up to date.

The Council has begun to overlay more data on its building models, making them even richer sources of information for Council staff managing them. This includes the addition of emergency features like water shut-off valves and fall-restraint brackets.

Mr Cantwell says the project highlights the growing demand for digitisation of built assets. While SMRT Consulting embraces virtual reality, cloud computing and the latest collaboration tools, it's the digitisation of simple floor plans that often proves to be the most versatile and widely used feature of any BIM modelling project, he says.

**“ There's benefit to New Zealand as a whole from BIM modelling. Not just councils, but building managers, government agencies like the Defence Force, and many others. ”**

TANE DUNNE, RENEWALS PROGRAMME MANAGER, WELLINGTON CITY COUNCIL

## AT A GLANCE

- BIM technology used to record all of Wellington City Council buildings in an industry standard 3D format.
- Standardised Property Information Guides containing building plans and data are available to staff in hard copy and electronically via the Council's OneCouncil system.
- The building models provide a standardised format for facility and asset management and planning, supporting decision-making and tender processes, and making it easier to match buildings with tenants.
- Staff use hard copy versions of the building models to collaboratively mark up plans and explore ideas with others, both inside and outside of the Council.
- The building models are useful for valuations, tenancy advisors, data analysts, facility managers, asset managers, designers, contractors, emergency management staff, planners, renewals.
- BIM digital models have been supplied to consultants undertaking preliminary design work on building alterations, saving money and speeding up the process by removing the need for consultants to source the information and create plans themselves.



**BETTER  
BUILDING  
INFORMATION**

- Building Information Modelling
- Asset Data Management
- Asset Condition Surveying

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