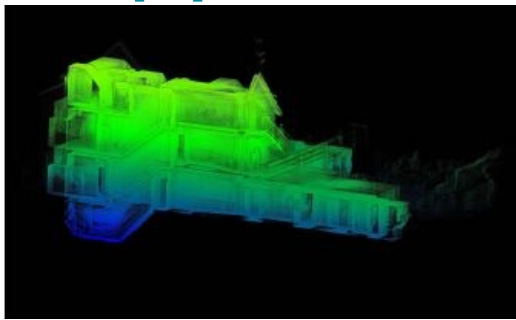
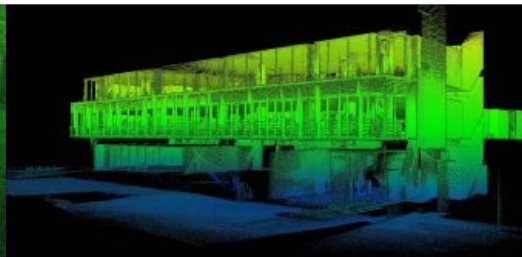
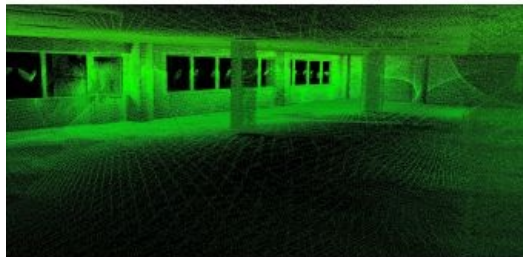


KEEPING UP WITH DEMAND IN A RAPID, COST-EFFECTIVE AND TRANSPARENT WAY

How SLAM Technology Can Support New-build Projects



When it comes to new-build projects, there are numerous significant pressures on delivery, whether it's keeping to a strict budget, completing on time or even keeping all stakeholders in the loop throughout the build itself. Here, David Fowkes, sales director from 3D mobile mapping specialists GeoSLAM, explores how simultaneous localization and mapping (SLAM) technology can contribute to streamlining the entire new-build process.



As populations across the world continue to grow, demand for new-build housing is consequently on the rise. Our communities require affordable, fit-for-purpose and considerably designed homes that will stand the test of time, whether that's for an ageing population, new families or the young professional

market. However, despite these demands, the new-build sector is awash with external pressures which make it significantly more difficult to achieve property quota targets.

Putting the coronavirus pandemic aside for a moment, prior forecasts from the UK government have suggested growth in the construction sector will continue to rise by 2025 – but that when compared to other sectors, construction firms are not adopting digital technologies in the same way.

It's true that coronavirus has had a real impact on the construction sector globally as, depending on each country's government guidelines, many projects have been paused or restricted. Compounding this, the sector has also experienced labour shortages, low productivity and the requirement to minimize costs, so in a sense there is likely to be even more pressure for schemes to get back on track once the lockdown measures have been lifted.

However, as the world adapts to remote working where possible, the benefits of digitization are being felt much more keenly. Along with embracing artificial intelligence (AI), autonomous vehicles, sensors and thermal imaging, we anticipate digital twin technologies will be on the rise post-COVID-19 too.

BIM and SLAM – and how they work together in the construction sector

One of the most significant technological breakthroughs which the construction sector has already embraced is building information modelling (BIM). Transparency and sharing of information are real USPs, as BIM provides all stakeholders, including architects, surveyors, engineers, building owners, and even future residents with a 3D digital representation of any single building or entire scheme throughout its lifecycle.

Sitting at the heart of BIM is digital technology which extends 2D technical drawings into 3D virtual information models, with project management and visualization tools. One innovation in particular is helping engineers integrate BIM into projects: simultaneous localization and mapping (SLAM) technology.



Lightweight scanners such as GeoSLAM's ZEB-REVO or ZEB-HORIZON, can allow teams to map and monitor sites quickly on foot or with unmanned aerial vehicles (UAVs).

A technology first developed in the robotics industry, SLAM enables tools to scan indoors or other difficult-to-reach, enclosed spaces. Using information from sensors, normally Lidar and imagery, digital 3D maps can then be created based on the location of the device, without the need for GPS.

SLAM-enabled mobile, lightweight scanners such as [GeoSLAM's](#) ZEB-REVO or ZEB-HORIZON, can allow teams to map and monitor sites quickly on foot or with unmanned aerial vehicles (UAVs or 'drones'). But how can SLAM and BIM work together to speed up new-build projects, reduce costs and increase productivity for all stakeholders on-site?

Keeping projects on deadline and costs down

At any point whereby a new-build property or entire scheme requires a survey or progress report, traditional build methods may have relied on hiring an expert to operate a static scanner, taking time to set up and then map out the site. The data would then be taken off-site and processed in an office – making it tricky for any 'gaps' or miss-scans to be re-surveyed quickly.

Today, however, projects require a much quicker turnaround on data capture. As the saying goes, 'time is money,' and chains of production in new-build schemes are complex, relying on each specialist in the project timeline to complete their work to a tight schedule. Handheld mobile mapping technology using SLAM can capture and process data in hours and minutes, rather than days and weeks, meaning there's minimal (expensive) downtime for contractors on-site.

Schemes may need regular surveys to generate new 3D models as a development takes shape, and can also help project teams highlight any potential issues early on in the build process. It is, of course, much more cost-effective to adapt and fix any such complications as soon as they are noticed, rather than spot them much later – when it's more expensive (and potentially even impossible) to address.



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Working around hazardous or inaccessible building sites

Accessibility can also be an issue for surveyors, as teams often only have a short amount of time available to them in which to get all of their measurements taken and compare as-built models against the design plan.

With a handheld mobile mapping device using SLAM, any member of the site team can operate with minimal training required. The GeoSLAM's ZEB-HORIZON for example, has a 'walk and scan' method of data collection, capturing 300,000 points per second, with an ability to capture distant features at a range of 100 metres. This ability not only saves time throughout projects, but also reduces the risk of injury when operating in potentially hazardous build locations.

In new-build environments, buildings can be part-finished with potentially dangerous areas to navigate on foot - whether it's due to exposed hazardous materials, large-scale machinery or even vertigo-inducing heights. If multiple scans are needed, health and safety becomes even more of a factor – and static scanners or bulky surveying equipment quickly become ineffective.

Maintaining clear channels of communication – even with residents

The construction industry has traditionally been wary of adopting new technologies, but recent years have demonstrated the importance of using robots, drones, and new ways to report progress, making the development process – from concept to completion – more efficient and transparent for all stakeholders involved. BIM has played an important role in this.

Clear communication is of course applicable from day one on a scheme, allowing engineers to bear in mind architectural guidance, contractors to stay close to design plans, and developer project leads remain up to date on how any given unit is progressing.

For new-build projects which are sold from plans, this is compounded by the demand from future residents to be kept up to date in the build process. After all, their hard-earned money is in part funding the scheme – and as any developer will know, they can often shout the loudest when seeking an update.



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Conclusion

Digital technology is changing the way our new-build projects are designed and constructed. And though, to date, the sector has benefited from steady growth, COVID-19 restrictions have emphasized the pressure on margins, which is unlikely to subside. With this in mind, it is vital that the sector, which has historically been slow to respond to technological change, embraces the digital technology that can help organizations to imagine, design, and build the structures and cities of tomorrow at higher volumes and deliver higher profits.

As we navigate how the 'new normal' is going to be post-COVID-19, the construction sector is bracing itself to be back on track as soon as possible. Demand for new build properties is still significant, and if other sectors are teaching us anything, it's that digitization of processes can make a real difference. Whether it's a determination to keep margins down or stick to an increasingly tight schedule, SLAM technology could be a real turning point for teams looking to meet those new-build targets, both in the UK and internationally.

