GeoSLAM Customer Case Studies

a range of projects from around the world

GeoSLAM.com

GeoSLAM – The experts in 'go-anywhere' 3D mobile mapping technology

Architects, engineers, facility managers, surveyors – they are all seeking ways to be more profitable, more efficient and more competitive. The demand for up-to-date, accurate 3D models is greater than ever before. And that's exactly where we come in - we know our customers are **saving money and gaining the competitive edge** with our 3D mobile mapping solutions. Our handheld 3D laser scanners are lightweight and easy-to-use. **Plus** - anyone can build a highly accurate 3D model of any indoor, underground or difficult to access environment within minutes.

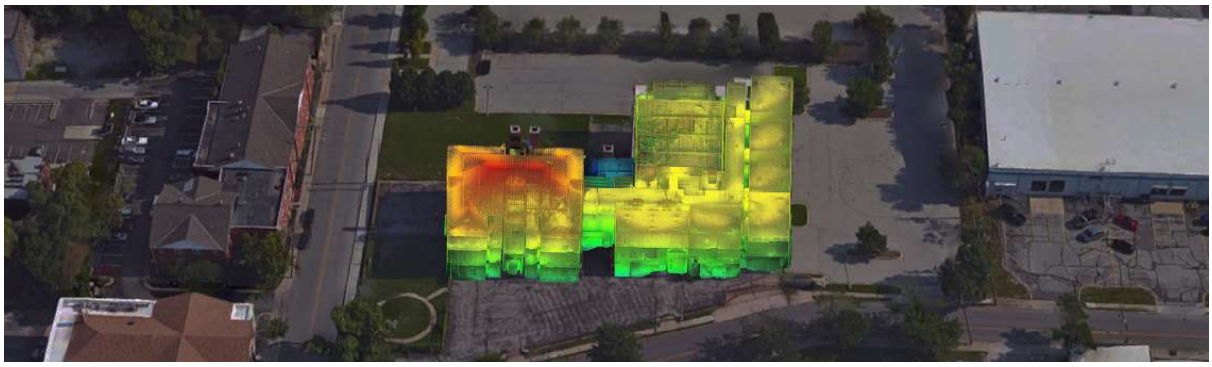
We know our customers save money with our solutions: a logistics firm in the US has already saved over $800k within a year, and a large transport operator in London estimated that their project cost will reduce from £3m to £1m using our technology – that's a **£2m saving**. Repeatedly customers have told us that they can measure buildings and create 2D plans & 3D models 10 times faster than with traditional equipment – **10 times**! With our tools, customers are delivering BIM models a great deal earlier than expected - in many cases saving weeks or months of work. Customers are also expanding their range of products and services by taking on projects that would otherwise have proved too difficult or too costly when using traditional survey equipment alone.

Our customers are more **profitable**, more **efficient** and more **competitive** with our solutions. We don't just sell products, we deliver results which transform businesses' bottom line. We know our solutions are changing the economics of 3D laser scanning.

But don't just listen to us, here's what our customers around the world have to say…

ATTUCKS SCHOOL, KANSAS CITY, UNITED STATES

GeoSLAM SCORES TOP MARKS AT CENTURY OLD SCHOOL



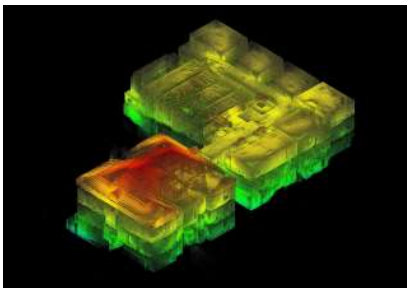
Transforming an ageing school in the Jazz District of Kansas City to a community arts centre required the power of today's real-time technology. The Attucks building, built in 1905 and renovated in 1922 due to overcrowding, has undergone several more developments over the years. For any plans to be approved on the site of the Attucks School, the commission needed substantial and comprehensive drawings – materials, floor plans, site drawings and elevations.

With several hazards identified - visible deterioration in the wood floorings, ceiling collapses, and air quality conditions including asbestos - a fast, accurate and safe survey technique was required.

Civil engineering firm, BHC Rhodes, embarked upon the complex task of a 3D Revit BIM (Building Information Model) using GeoSLAM technology. The handheld "go-anywhere" ZEB-REVO is designed to be used without comprehensive training, meaning you can 'pick up and go', saving additional preparation time for any members of staff previously unfamiliar with the technology. It's a simple setup and data gathering is quick and easy; wherever you can walk, you can scan.

With the aid of these lightweight, mobile scanners – specifically designed to scan difficult to access spaces – the entire property was scanned in only 4.5 hours, recording more than 43,000 measurements per second. A BIM model was provided two weeks earlier than expected providing a comprehensive picture of the asset. Only with these modern tools could a real-time digital twin of the ageing building be created quickly, and safely – saving considerable time and money.

"A BIM model was provided two weeks earlier than expected providing a comprehensive picture of the asset.



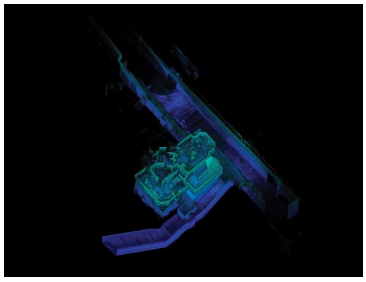
The challenge:
How to scan a complex and hazardous environment in the shortest possible time.

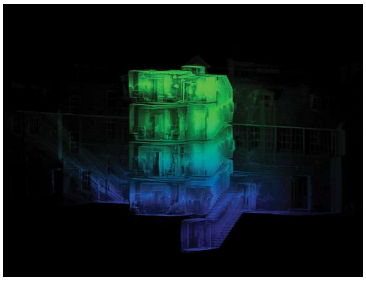
The solution:
Train staff in under 15 minutes and scan at walking pace with the ZEB-REVO.

ORIEL COLLEGE, OXFORD UNIVERSITY, UNITED KINGDOM

UNIVERSITY CHALLENGE:

TO DELIVER RAPID 3D RESULTS IN HALF THE TIME





Midland Survey are experts in surveying complex and difficult to access spaces where there is limited or no GPS, but Oriel College with its labyrinthine network of historic buildings brought a particular set of challenges.

Oriel College, part of the prestigious University of Oxford in the UK, is nearly 700 years old, with around 200 rooms across five storeys, including an "island site", accessible only via tunnel. The structure has been extended over the years and no accurate floor plans or elevation drawings exist. As a world-class institute, it is occupied 24/7 and opportunities to accurately scan with minimal disruption are few. Traditional tools were not an option due to the network of rooms spread across 5 storeys.

David Johnson, Director of Midland Survey said, "Due to the lack of GPS coverage in the tunnel, the only option was to use GeoSLAM's 'go-anywhere' ZEB-REVO. The unusual shape of the building, with its unconventional layout and complex network of rooms, meant it was too difficult and time-consuming to survey with traditional static scanning methods (as this would require multiple individual set-ups and increased post-processing work). We needed a lightweight, mobile tool that works well in enclosed environments. Using the ZEB-REVO around 200 rooms were scanned, amounting to 12,000m². Across 5 days, 12 individual rapid ZEB-REVO scans were completed each taking just 30 minutes. The entire project was completed in around half of the total time that would have been required using static equipment."

"We frequently work in hazardous environments, as well as in complex and difficult to access spaces where there is limited or no GPS coverage such as heritage buildings with thick stone walls. We often have limited time on site to accurately create a 3D model. Access to user-friendly technology such as the ZEB-REVO that scans multi-level environments and produces accurate and high-quality 3D survey data, is a real game-changer for us."

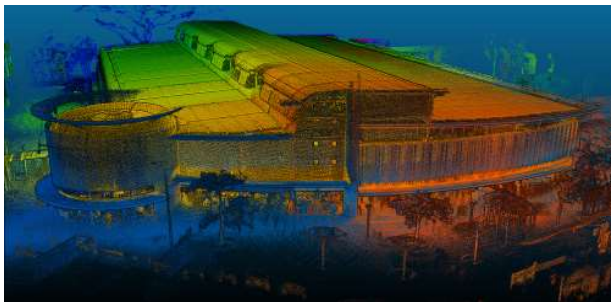
"The entire project was completed in around half of the total time that would have been required using static equipment. The ZEB-REVO is a real game-changer for us.

The challenge:
How to quickly scan a GPS-free historic site with over 200 rooms.

The solution:
Use a lightweight mobile scanner to rapidly capture 3D data 'on the go'.

VIRTUAL SINGAPORE, SINGAPORE

GeoSLAM PUTS SINGAPORE ON THE MOBILE MAP



Singapore is home to some of the most profitable financial services, manufacturing and oil-refining corporations in the world. But with its accomplishments come some very specific challenges for a city-state which is limited by space but still demanding growth. Determined to future-proof Singapore's success, the country has embarked on one of the most ambitious digital twinning projects the world has ever seen – creating a dynamic 3D city model and collaborative data platform, including 3D maps of the region.

Titled "Virtual Singapore", it will be the authoritative 3D digital platform intended for use by the public, private and research sectors. The tool will contain previously-collected and real-time data, allowing users to simulate both present and future scenarios. Virtual Singapore relies on key input datasets from multiple sources to build up a clear, accessible, comprehensive tool to analyse and understand Singapore's built environment.

At the initial stage of the project a significant challenge was thrown up. It quickly became clear that aerial imagery would not adequately capture information on 'void decks' - open spaces typically found on the ground floor of the city's apartment blocks. Also, semantic 3D modelling was required which comprises detailed information such as texture and material representation of geometric objects. In the face of fierce competition, GeoSLAM's ZEB-REVO was selected as the most innovative and efficient scanning solution for these 'hard to reach' places.

With a handheld "go-anywhere" ZEB-REVO, field teams could quickly capture a dense and accurate point cloud of an entire void deck, which was then used to model the deck geometry to incorporate into the existing building models. 376 buildings with void decks were scanned using the ZEB-REVO, taking approximately 100 hours – an enormous time-saving exercise which would have ordinarily taken up to 40 times longer than using traditional surveying methods.

The ZEB-REVO is often used alongside terrestrial hardware as the products are highly complementary. The data output can be easily combined through geo-referencing or scan-to-scan matching and then used to build complete 3D models. In this instance, the combination delivered highly detailed and rapid results while also significantly minimising costs.

> **A huge time-saving exercise which would have ordinarily taken up to 40 times longer if using traditional surveying methods.**

The challenge:
How to scan "hard to reach" areas where aerial and static terrestrial scanning fail.

The solution:
Deploy the handheld ZEB-REVO to capture 376 buildings in 100 hours.

HERITAGE BUILDINGS, JERSUSALEM

REDUCING SCANNING TIME OF HISTORIC SITES FROM WEEKS TO HOURS

Image courtesy of Jason Quartermaine.

The ZEB-REVO enabled the creation of a detailed 3D record in just 30 minutes – a fraction of the time that it used to take to create a simple 2D record.

48 hours to scan three historic sites in Israel – ambitious or impossible? Jamie Quartermaine from Oxford Archaeology, equipped with a handheld 3D mapping device from GeoSLAM, was determined to find out. Jamie's first stop was the Schneller building in Jerusalem. In its 160 year history it has been used as an orphanage, barracks and ammunition arsenal. Just last year, an archaeological team unearthed the remains of a Roman bath house and winery underneath the site. The next stage of the building's history is a conversion into a museum of Judaism – hence the requirement for a complete, high-accuracy survey of the site.

Made up of four floors, 130 rooms, an outer courtyard and a number of stables, Jamie needed to work quickly to scan the entire site. Using the handheld 'go-anywhere' ZEB-REVO, in three - 30 minute scans he captured the entire building, including survey control points to georeference the data. Using traditional scanners, this would have taken several weeks and involved multiple set-ups.

Next stop was an elegant and beautiful 12th-century Benedictine monastery. With no more than 30 minutes between the end of the Vespers – the evening service – and the time when the public would be allowed into the monastery, Jaime carried out a quick reconnaissance and accurately captured the unique domed building, only possible using GeoSLAM's 'go-anywhere' device.

Final port of call was a delapidated 19th-century merchant house in the ancient Arab town of Jaffa. The challenge here was to record the building while construction works were in progress, with hoardings and scaffolding obscuring structures. A near impossible task, but the ZEB-REVO was still able to collect survey-grade data in a matter of hours, which formed the basis of a working record of elevations, sections and plans.

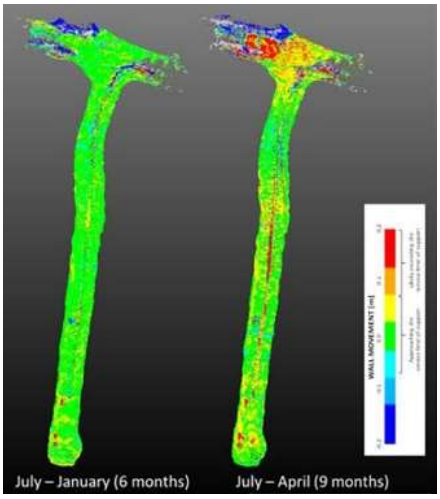
In under 48 hours Jamie had captured highly accurate 3D images of 3 heritage buildings. Proof indeed that with the ZEB-REVO, what used to take weeks can now be done in hours.

The challenge:
How to scan a historic site that is constantly in use by the public.

The solution:
Use the 'go-anywhere' ZEB-REVO to swiftly capture 3D data without the need for multiple set-ups.

BECK ENGINEERING, AUSTRALIA

QUICKLY AND SAFELY MAPPING OUR UNDERGROUND WORLD



Creating highly-accurate underground maps for the mining and natural resource sector is one of the most demanding forms of surveying. Most mine environments are hazardous, and mining professionals need to work in tight, enclosed spaces, which are uneven and difficult to access. GPS coverage is, of course, non-existent.

One firm embracing these challenges is Beck Engineering, an Australian mining engineering consultancy specialising in mining and rock mechanics analysis. Beck Engineering need to map mines under intense time constraints using versatile technology which must be adaptable to this tough environment. For this purpose, the company has chosen GeoSLAM's handheld mobile mapping devices that are compact, portable and deliver a high level of accuracy. With GeoSLAM's 'go-anywhere' 3D technology, Beck Engineering has immediate access to invaluable data regarding underground conditions. This time-sensitive information means the company can accurately measure the shape of an excavation or tunnel over time. As a result, tunnels can be faster and better constructed, while being safer and considerably more cost efficient.

The applications of the spatially continuous monitoring data collected by GeoSLAM's devices are being applied to a wide range of geo-mechanical applications, providing their clients with a previously unattainable insight into rock mass behaviour.

Evan Jones, Senior Rock Mechanics Engineer at Beck Engineering said, "We have continued to use GeoSLAM products as they have proven to be affordable, lightweight and sufficiently robust devices for their application underground. GeoSLAM continue to produce a high-quality device that is at the forefront of practical mobile laser scanning devices."

"We have continued to use GeoSLAM products as they have proven to be affordable, lightweight and sufficiently robust devices for their application underground.

The challenge:
How to map hazardous mines under intense time constraints.

The solution:
Use the robust ZEB-REVO to rapidly map difficult to access areas, without the need for GPS.

NURSING HOME, UNITED KINGDOM

TAKING CARE TO SAVE COSTS AND MINIMISE DISRUPTION WITHOUT COMPROMISING ACCURACY

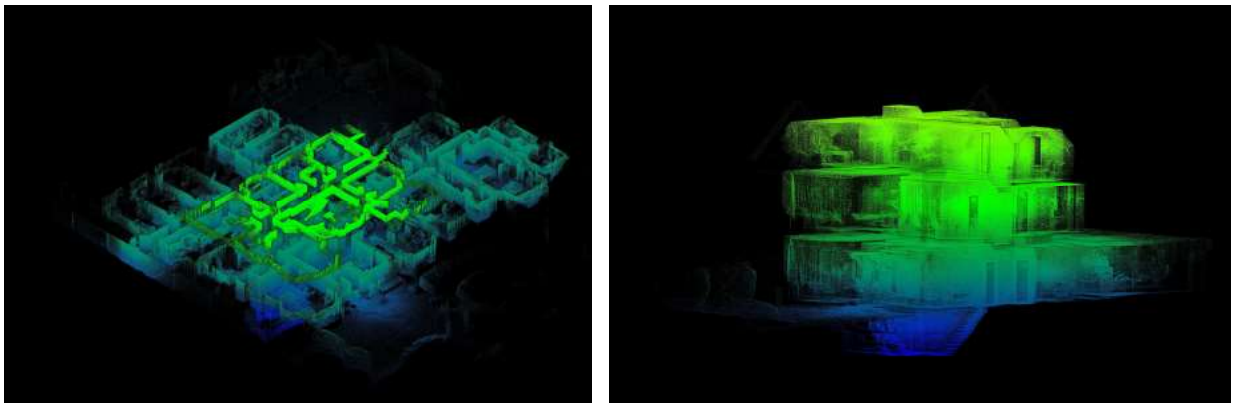


Image credit / courtesy of Cloud Compare

Today's surveyor needs to quickly and accurately capture, manage and utilise 3D spatial information – often in environments where there is very limited time on site. Omega Geomatics, a land surveying practice in the UK, took on one such task when they produced 2D floor plans for a nursing home, while the site was occupied 24/7. Paramount was ensuring minimum disruption to residents, while still achieving a high level of accuracy. Measuring 663m^2 and with 23 residential rooms, communal and staff areas, the project team needed to find a new surveying method that meant they could walk and scan each resident's room quickly without the need for traditional survey techniques.

Two surveyors visited the nursing home and coordinated five spheres by the building exits on multiple levels. The surveyors then walked around the building with GeoSLAM's handheld 'go-anywhere' ZEB-REVO; so fast and efficient that information from each room was collected in just 10 to 20 seconds. The team took long-distance and height checks, and external scans were used as a further accuracy check. The entire scan took just 30 minutes and the client was provided with accurate 2D plans within 24 hours, notably without any distress or disturbance to residents.

The rapid data collection led to huge cost-saving benefits. With just two team members required for the project and less time expended on site, the overall cost was dramatically reduced. One area that was not diminished was accuracy. The scan achieved an average +/-15mm which met the needs of the client.

"The entire scan took just 30 minutes and the client was provided with accurate 2D plans within 24 hours.

The challenge:
How to deliver accurate scanning results without disrupting the daily lives of nursing home residents.

The solution:
Walk the site using the handheld ZEB-REVO and capture accurate 3D data in 30 minutes.

COWI, DENMARK

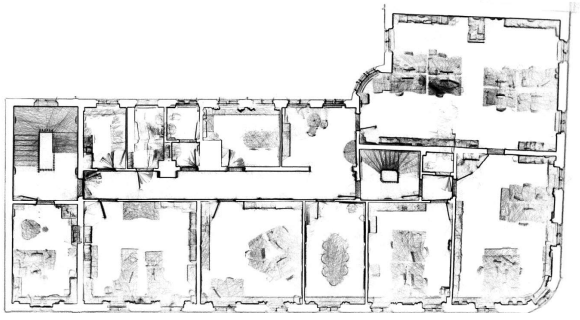
ENGINEERING RESULTS TEN TIMES FASTER THAN TRADITIONAL SURVEY METHODS

Digital technology is changing the way we design, construct and maintain our infrastructure. With the built environment ever more complex, traditional 2D data is not up to the task. As we move towards a more intelligent, more integrated, BIM-focused methodology, 3D data is becoming the norm. To stay ahead of the competition, surveying firms need to integrate innovative engineering approaches, digital technologies and intelligent data.

One such firm is COWI, a multi-discipline engineering and planning firm based in Denmark. Eager to accelerate survey workflows, COWI has embraced digital engineering and added several GeoSLAM solutions to their arsenal of specialist scanning equipment. In just 6 short months since acquiring their first handheld laser scanner, a two-man team at COWI has used the 'go-anywhere' mapping device to survey the interiors of some 400 municipal buildings; mapping over 16,000 rooms and measuring more than 300,000 m2.

"GeoSLAM's solutions are changing the way we survey buildings," enthused Morten Thoft, Chief Specialist of Mapping & Surveying. "We can now measure building plans 10-times faster than we used to with Total Station or traditional survey equipment. Our decision to purchase another GeoSLAM solution was easy. With their handheld devices, we surveyed more buildings with more rooms in six months than traditional survey equipment would have allowed in many years. And we were able to capture more information in the process."

"We can now measure building plans 10-times faster than we used to with Total Station or traditional survey equipment… surveying more buildings with more rooms in six months than traditional survey equipment would have allowed in many years.

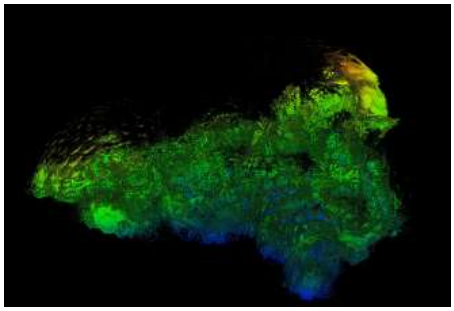


The challenge:
How to survey multiple premises in the minimum time without compromising on data quality

The solution:
Use the mobile ZEB-REVO and scan more buildings in shorter time than traditional tools.

EDEN PROJECT, UNITED KINGDOM

MAKING FOREST SURVEYS A WALK IN THE PARK



Monitoring and understanding our environment has never been more important as the threat of climate change looms and governments step up to better manage their greenhouse gas emissions. Tom Potter, a doctoral researcher at the University of Leicester, UK, set out to further develop a technique to estimate biomass and carbon more efficiently using state-of-the-art, mobile LiDAR sensors across multiple, complex forest environments.

To do so he visited the Eden Project in Cornwall, UK which reflects a true tropical forest - representing different forests from around the world with a rainforest 'biome' of over 1,000 tropical trees and plans. However, he had to work around several challenges. For fixed point scanners, the high-density plots of specimens created a problem of shadows – known as 'occlusion' – whereby the nearest features will block out features behind. This also limits the ability to acquire accurate measurements to create a comprehensive 3D model. And with the biome being open to the public and a popular tourist destination, Tom only had a few hours each day before opening hours - insufficient time for a traditional static survey.

Mobile surveying equipment that was able to take readings easily and quickly from even the densest areas was needed to ensure precise scans were taken to accurately calculate biomass and carbon storage potential.

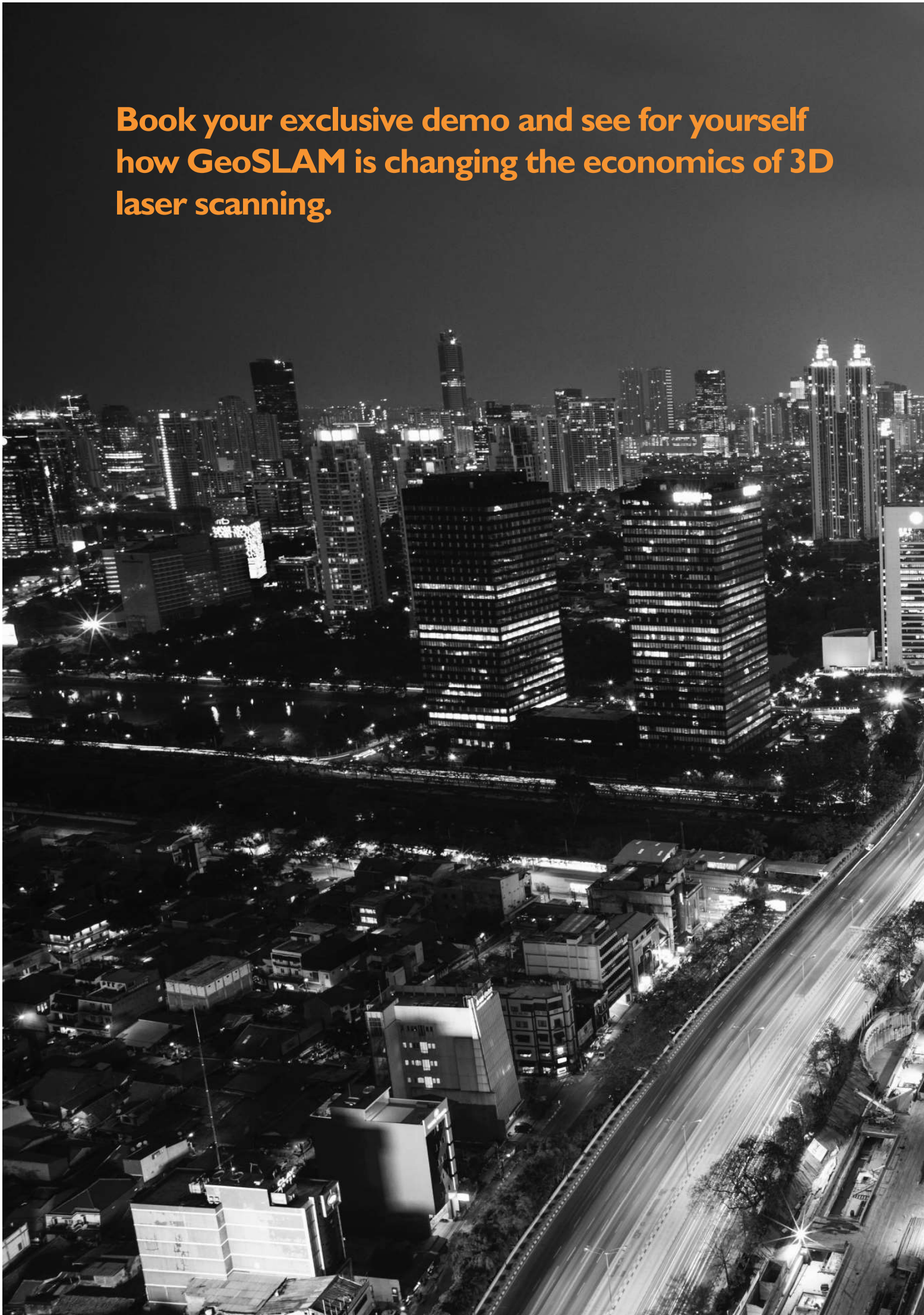
Tom found the mobility and speed of GeoSLAM's ZEB-REVO to be the perfect solution. The lightweight scanner can be pole mounted, handheld or even attached to a vehicle or drone - collecting over 43,000 measurement points per second. Instead of hundreds of time-consuming static scans, Tom captured all angles by simply walking in a loop around the rainforest environment. He then converted the point cloud data into 3D volume-based plots to derive above-ground biomass and carbon densities for multiple types of tropical forest. A comprehensive dataset was built, containing information for any type of forest that scientists can use to make calculations with minimal survey effort or expertise. And all at considerably less expenditure than traditional survey methods.

"I was able to look at our first scan within an hour of data collection and using GeoSLAM's local processing software, the raw scan data was processed on-site, with no internet connection required – useful when in an actual rainforest!

The challenge:
How to quickly and accurately map dense forest areas.

The solution:
Simply walk in a loop using the lightweight ZEB-REVO and accurately produce 3D data in minutes.

Book your exclusive demo and see for yourself how GeoSLAM is changing the economics of 3D laser scanning.



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