

AERIAL LIDAR

SPATIAL DATA CAPTURE, PROCESSING AND INSIGHTS

Capability and experience

rpsgroup.com





MAPPING THE FUTURE

As cities grow and land uses evolve, reliable spatial data is pivotal for managing built and natural environments effectively.

Why LiDAR?

Light Detection and Ranging (LiDAR) is a method of mapping that allows high levels of detail to be recorded about environmental features such as topography, vegetation, buildings and infrastructure.

LiDAR can help you to quickly and cost-effectively identify and document assets over thousands of kilometres, and is an accurate, rapid, and repeatable method. Aerial LiDAR is suitable for mapping small urban development parcels all the way through to broadacre land and densely forested or sparsely populated areas.

Using aerial LiDAR capture and processing techniques, we can record detailed datasets that can be used as a baseline to inform complex decisions and requirements.

LiDAR is a great solution for:

- Forestry and natural resource management
- Agriculture and environmental management projects
- Flood, disaster and resilience assessment and planning
- Transport corridor identification
- Energy, powerline and telecommunications initiatives
- City and precinct planning.

INTRODUCING THE RIEGL VQ-1560 II-S

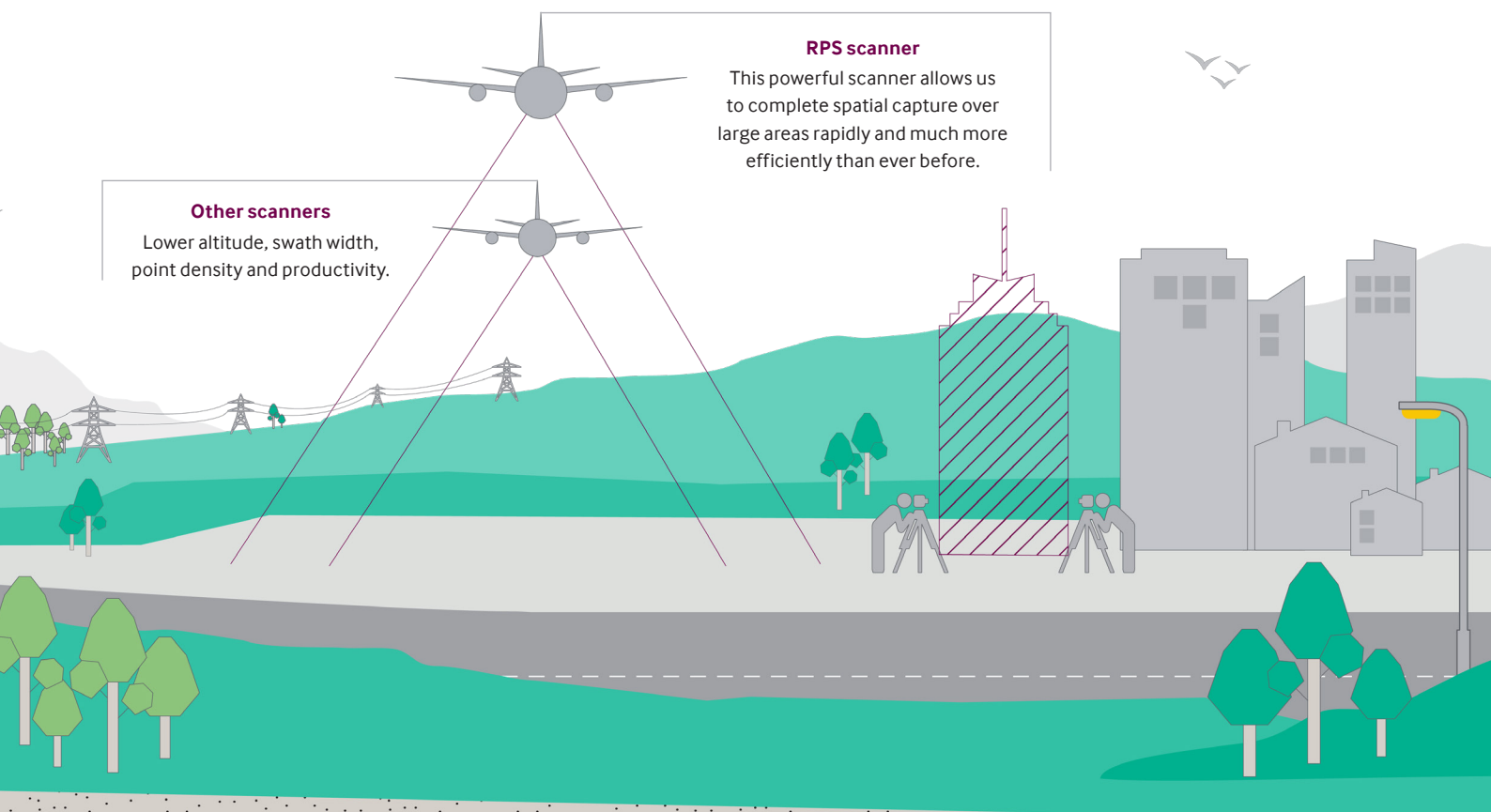
RPS now has the most advanced LiDAR scanning technology in the Australian market (Riegl VQ-1560 II-S Dual LiDAR Waveform Processing Scanning System).

This powerful scanner allows us to complete spatial capture over large areas rapidly and much more efficiently than ever before. Capture resolution has also leaped, with the ability to capture up to 60 points per square metre in a single swath.

The Riegl 1560II-S features two scanners tilted against each other at 28°. This unique 'cross-fire' pattern of scanning minimises shadowing in forestry capture allowing trees to be visualised in unprecedented detail. The VQ-1560 II-S is also perfect for city mapping where the 'urban canyon' effect can prevent the capture of important details.

Features and benefits

- Capability to achieve more than 2.66 million measurements per second on the ground
- Ultra-high point density up to 60 points per square metre
- Ultra-wide area, high altitude mapping
- Optimum measurement distribution with two channel scan lines tilted at 28 degrees
- IMU/GNSS unit and high-resolution RGB camera integration for additional data capture options.



RPS LIDAR CAPTURE PRODUCTIVITY COMPARISON

			POINT DENSITY (PPSM)					
			4	8	16	20	40	60*
RPS	Riegl 1560II-S	Flying Height	3,498	2,868	1,953	1,562	781	638
		Swath Width	3,918	3,212	2,187	1,750	875	402
		Productivity	752	617	420	336	168	76
OTHERS	Galaxy Prime	Flying Height	3,507	1,754	877	701	351	N/A
		Swath Width	4,050	2,025	1,012	810	405	N/A
		Productivity	765	383	191	153	77	N/A
	Riegl 780II	Flying Height	2,600	1,839	947	758	N/A	N/A
		Swath Width	3,002	2,123	1,094	875	N/A	N/A
		Productivity	577	408	210	168	N/A	N/A

Productivities shown are to compare scanners under ideal conditions. Exact values will change depending on a variety of factors. Above figures have been derived by assuming minimum flying heights, maximum FOV and target reflectance, and similar flying speed with minimal variation in topography. Refer to individual manufacturers product brochures to determine exact figures for particular scenarios.

*Point Density of 60ppsm is achievable with the VQ-1560 II-S by reducing field of view from 60 to 35.

OUR APPROACH

We support you through all phases of the project lifecycle from project planning and data capture to processing and spatial insights.

1 PLANNING

We work with you to understand your project requirements and design a LiDAR capture, processing and data product strategy to meets your needs.

- Pre-project technical advice
- Project planning
- Flight planning
- Advice on structuring your specifications for maximum value

2 CAPTURE

We deploy our LiDAR operations team to capture data in line with the agreed capture plan and verify accuracy through ground control.

- Mobilisation to site
- Management of flight and capture logistics
- Regular progress reporting
- Ground survey verification

3 PROCESSING

Our in-house processing team completes automated and manual processing of raw LiDAR data to develop the spatial information products you require.

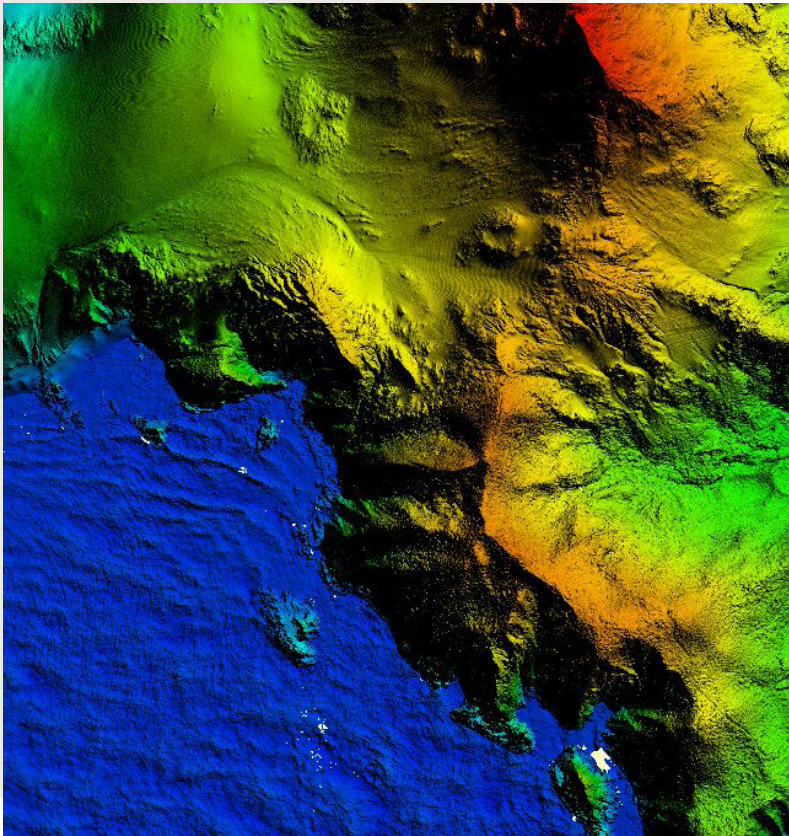
- Data classification
- Quality assurance
- Data modelling
- Preparation of derived products
- Data visualisation

4 INSIGHTS

Drawing on our team of spatial, environmental, planning and design specialists, we analyse and prepare valuable insights and recommendations based on your data.

- Long-term monitoring strategies
- Asset management advice
- Site identification and urban planning
- Heritage and environmental management.

OUR WORK



Northland LiDAR acquisition

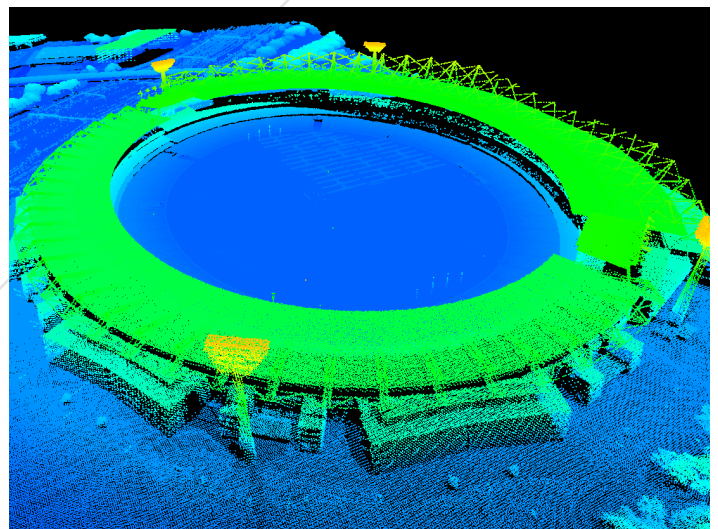
Location: Northland, New Zealand

RPS has completed aerial LiDAR capture for the entire Northland Regional Council local government area—the first major LiDAR survey to be initiated since the development of the New Zealand National Aerial LiDAR Base Specification. The deliverables are forming an important foundation for the New Zealand National Elevation Dataset managed by Land Information New Zealand (LINZ), a spatial information source that supports the management of land and resources. Data capture for the project was completed at various specifications including three points per square metre ppsm) over the majority of the designated capture area, and a higher 4ppsm specification over forestry areas.

Greater Melbourne LiDAR capture program

Location: Melbourne, Victoria

RPS supported the Department of Environment, Land, Water and Planning (DELWP) to capture LiDAR over all of Greater Melbourne at a high point density, 8 points per square metre. The project utilised multiple aircraft during several stages of the project to capture data under tight urban flight restrictions close to Tullamarine Airport. Despite the challenging capture conditions, we were able to collect all data and deliver a high-quality dataset to DELWP. This project was the winner of the 2019 Victorian regional Asia Pacific Spatial Excellence Awards and was delivered on budget, with the client using the high point density dataset to derive a wide range of insights for the city.



Central Highlands LiDAR capture program

Location: Central Highlands region, Victoria

RPS was commissioned to carry out spatial capture over the Central Highlands region of Victoria, flying 3,200 km² of mountainous terrain. The survey was undertaken to create a detailed ground model for use in hydrological studies, and to identify possible habitat for the critically endangered Leadbeater's Possum. The complex terrain required a very detailed flight plan to maintain the high level of accuracy and point density needed for a project of this nature. Despite challenging terrain and unfavourable weather patterns, RPS was able to carry out the LiDAR survey, process all derived products and utilise the newly developed QA4LiAR tool as an additional quality assurance method.



Ericsson Fixed Wireless NBN Project

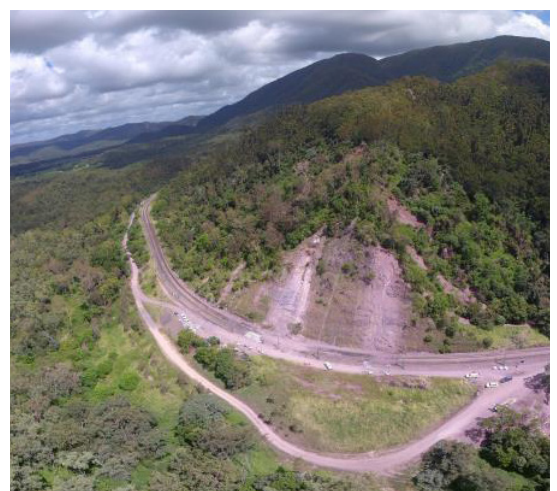
Location: Various, Australia

Ericsson was engaged by NBN Co to assist in the setup and running of the National Broadband Network – specifically, where locations could not be serviced by wired connections due to their remoteness or physical limitations to backbone cables. Ericsson's solution was to establish a series of wireless connections using new equipment on pre-existing mobile network towers. The equipment used for these fixed wireless links requires direct line of sight between towers and a specific clearance around this line of sight to prevent signal interference. Ericsson engaged RPS to capture LiDAR data and photography for the proposed connections between towers, to determine which were suitable paths, and which would require clearing of vegetation to prevent interference. RPS assisted with this capture in almost every state and territory in Australia over a series of years and was instrumental in assisting in the setup of this portion of the NBN which provides internet connection to some of Australia's most remote communities.

Aurizon Tropical Cyclone Debbie Corridor Recovery

Location: North Queensland

Following the devastating impact of Tropical Cyclone Debbie on homes, businesses and infrastructure in North Queensland, RPS deployed to assist Aurizon in assessing damage to the Goonyella Rail Corridor where rail access from the Bowen Basin coal mines to coastal ports had been blocked. RPS completed LiDAR cross sections of the tracks, detailing areas of the corridor affected by flooding, subsidence and debris. Just 24 hours later our UAV pilots were on the ground to capture detailed aerial photography that would allow us to create 3D models and topographic meshes for use by engineers in rectification works planning. The rapid deployment of our team just hours after initial contact from Aurizon helped the company resume freight traffic on the rail corridor just four weeks post Tropical Cyclone Debbie.





ABOUT RPS

Founded in 1970, RPS, A Tetra Tech Company (RPS) is a leading global professional services firm of 5,000 consultants and service providers.

With experience across 125 countries and six continents, we define, shape and manage projects that create shared value for a complex, urbanising and resource-scarce world.

From the transport infrastructure initiatives that keep our cities moving to the renewable energy investments that will power our future, we collaborate with industry, government and the community to take critical projects from ideas to reality.

We work across six sectors:

- Energy
- Transport
- Property
- Water
- Resources
- Defence and government services.

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