



**ROBERT CARROLL
EXPLAINS HOW OBLIQUE
IMAGERY IS SHAPING THE
CURRENT AND FUTURE
STATE OF LOCATION
INFORMATION**

Oblique aerial imagery has come a long way in the past few years. Cloud-based subscription imagery services have emerged, providing governments, public safety organisations and commercial industries with continuing access to ever-evolving oblique aerial imagery, transforming the way people live and work across the globe.

While vertical imagery continues to be prevalent due to its mapping applications, its context is limited. Its value in delivering information for remote sensing, for example, or providing a top-down view

of the Earth, is still critical. However, the demand for oblique aerial imagery in today's geospatial landscape continues to rise.

Driven by the need to improve location analysis and map the world with more detail, the demand for fast access to up-to-date oblique aerial imagery is fuelled by several key industries.

Public safety and emergency management

Across the globe, public safety organisations and emergency responders fight similar challenges. As mobile technology becomes ubiquitous, quickly locating people in need during an emergency has become a more difficult task. Without a fixed landline location, emergency responders are often dispatched to the wrong location, or the response time for an emergency is lengthened.

Oblique aerial imagery has helped solve these issues by assisting in 'visual triangulation' – the use of oblique images to

determine the location of a point in space. Leveraging the rich location information contained in oblique aerial imagery, emergency responders can identify landmarks in the vicinity of incidents not visible from a vertical view. These up-to-date visual cues enable emergency responders to locate citizens quickly and with precision.

Additionally, oblique aerial imagery has transformed the level of critical insight an emergency responder has access to before arriving at an incident. Crucial data, such as the location of emergency exits in a building, is now available – arming emergency responders with the knowledge to make them more effective in response efforts.

Logistics and delivery services

Public safety organisations and emergency responders aren't alone in facing challenges associated with a mobile-centric society. While they may not be dealing with life or death situations, logistics and delivery services are

CHANGING THE GAME



Vexcel's UltraCam installed in an aircraft

challenged with streamlining processes to meet the increasing consumer demands of faster shipment. And much like public safety and emergency services, the move to mobile makes identifying specific locations difficult.

As e-commerce spending continues to rise, along with an increase in package deliveries, cloud-based subscription services that provide access to up-to-date oblique aerial imagery are crucial to the success of these companies.

Oblique aerial imagery and vertical imagery can provide an unprecedented level of detail to evolving neighbourhoods and regions, with insight into current road conditions and evolving growth patterns. Oblique aerial imagery can view elements that are generally unable to be captured in a vertical view. For example, vertical imagery could easily be blocked by vegetation. Oblique captures a wider swath of land from an angle that makes it possible to see patterns that are unable to be detected with

a top-down view. This enables logistics and delivery services to better identify a location, with a stronger understanding of surrounding landmarks, better determination of building entrances, clearances and more. This critical information helps companies meet growing expectations from consumers for quick, accurate real-time updates on delivery status – and drives greater efficiency and accuracy in the order and delivery process.

Urban and regional planning

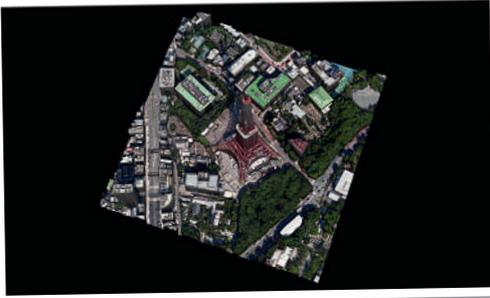
As GIS have become more advanced, Building Information Modelling (BIM) has become a significant part of the design and construction process. BIM enables everyone involved in a project to collaborate effectively with the right information on hand, whether it be accessing 3D visualisations, a project schedule or workflow.

As this transition has taken place, oblique aerial imagery has become an integral part of BIM. In order for BIM platforms to be effective,

they must have a strong understanding of the dimensions of a building. Up-to-date oblique aerial imagery provides the right angle for 3D modelling, so that architects, engineers and construction professionals are able to view and measure the proper dimensions of a structure as well as its facade, slope of the roof, and more. This is especially important in applications such as solar technology. If an architect is looking to add solar panels to a building, he needs to have a solid understanding of how sunlight and shade impacts the building – and if it is enough to provide adequate energy supply. Vertical imagery may not be able to assess this information accurately. For example, a tall building structure may cast shade on another building, impacting the ability to generate power. A top-down shot may not accurately capture this crucial information.

3D models are also crucial to the execution of smart city development, providing important information to

REMOTE SENSING



Digital surface model in 2.5D, textured with a distortion-free orthophoto

speed up and simplify the process of real estate development and management as well as infrastructure planning and land use calculations.

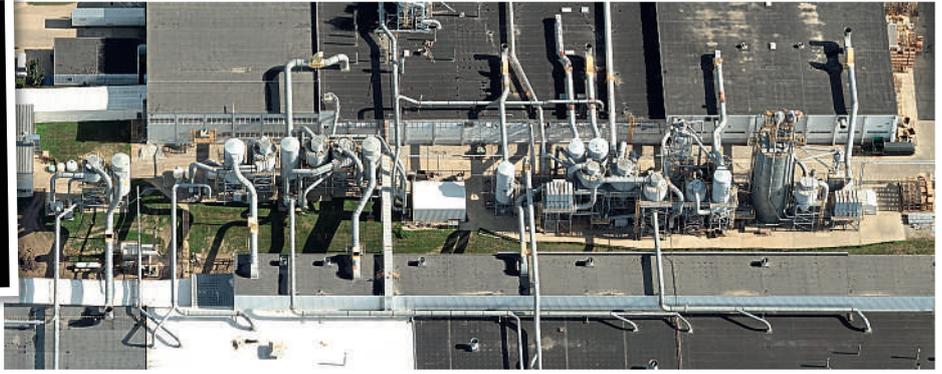
Smart cities must have ongoing access to rich, raw and accurate data via oblique aerial imagery. This ensures Internet of Things applications can integrate with the data, ensuring that the proper information is being fed to technologies such as those that power traffic signals, for example.

Insurance

The global insurance industry is experiencing a major shift. As technology continues to advance, insurance carriers are forced to keep up with changing demand, providing coverage for new areas of insurance such as autonomous vehicles and cyber security. Additionally, as consumers worldwide embrace digital transformation, carriers are also feeling the impact to evolve their business models. Consumers expect a fast turnaround on claims. As a result, insurers must be able to assess and determine appropriate coverage quickly and respond to claims faster than ever before.

The Geospatial Intelligence Center (GIC) was recently formed out of insurers' identifying this crucial need. It now provides national and metro digital maps, increasing situational awareness of properties and locations critical to insurers' business. Digital maps are developed using oblique aerial imagery that is collected annually using leading edge sensor technology from Vexcel Imaging for the most current, diverse and highly detailed geospatial data available for accurate property assessments. Insurers can then use this data to gain a comprehensive understanding of building exteriors.

In addition to visual information, the geometric precision of the aerial imagery is crucial in order to be able to measure inside the image. For example, a claims representative may need to measure the distance from a tree or a fireplace to a house, which might have an impact on the rate. These are critical elements to underwriting, as well as evaluating and processing claims. Real-time access to oblique aerial imagery helps insurers provide the appropriate coverage or manage a claim from their desktop – without having to step into the field. This becomes



Oblique aerial view shows intricacies of this plant



Accessibility check through measurements of clearance heights

critical in the face of disaster response, when claims are at their highest volumes and people need to get back on their feet quickly. Without oblique aerial imagery, insurers lack detailed information, for example the angle at which a tree fell on a house, needed to make fast decisions about a claim.

Framing the future of location information

While many of these developments are driving the market, they are also changing the future of location information by demonstrating the need for up-to-date data at high-resolution. This places considerable emphasis on the type of camera used in the initial and ongoing collection of data. For instance, the Vexcel UltraCam Osprey camera is a photogrammetric-grade camera that is geometrically and radiometrically calibrated. The imagery – vertical and oblique – is georeferenced, so measurements of height, length, elevation and more can be done directly in the images. This type of technique offers more than just the visual image and is quickly becoming the new standard for oblique aerial imagery. The richer the raw data, the more valuable the information that can be extracted.

Additionally, rather than looking at individual oblique aerial imagery collections, corporations are looking to have access to datasets they can access through the cloud –

at any time, from anywhere. As a result, new cloud-based subscription services such as the Vexcel Data Program continue to emerge, providing detailed and accurate imagery and derivative data products. Unlike imagery-only programmes, these subscription services are designed to provide an ecosystem around location information, enabling corporations to have access to data, tools and workflows they can implement and integrate with their own location information. For example, when the UltraCam Osprey is used for data collection within the Vexcel Data Program, because images are georeferenced, other vector data easily integrates over oblique imagery to provide enhanced analytics.

Oblique aerial imagery in the future

As market drivers continue to evolve from key industries, the geospatial industry must continue to meet demand with more sophisticated tools and services. Up-to-date, high-resolution oblique aerial imagery services, georeferenced images and integrated workflows will be necessary in providing accurate and useful location information and analysis for companies and organisations across the globe, saving them a significant amount of time and cost.

Robert Carroll is the director, national data program, at Vexcel Imaging (www.vexcel-imaging.com)

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