



Making Life Easier New Imaging Perspectives

Site inspections, identifying possible restriction zones and spotting potential problems can be a time consuming business for any professional who has to survey property or land around the country. Add to this travel time and manpower, and the costs soon start to escalate. A new development in aerial photography, however, is making life easier for these professionals. It involves the systematic capture of oblique aerial photos and is managed in new software technology to provide a 3D viewing experience.

By Richard Metcalfe

MultiVision

The new software technology is called MultiVision. Not only does it reduce or remove the need for costly onsite visits, but also it adds an extra dimension to visual presentations and, more importantly perhaps, improves potential profitability of projects. In the case of the initial planning process for an urban regeneration proposal, for example, this can provide you with the facility to download relevant oblique imagery and produce accurate plans without having to visit the site numerous times. The precise nature of the information enables you to put forward a stronger, more convincing planning application. Rather than the flat image provided by conventional aerial imagery, oblique photography provides on-demand multi-dimen-

sional, multi-perspective, high-resolution views. It allows quick access to visual information and helps you make critical decisions from your computer screen.

Getmapping have already captured over 300 square kilometres of London including Westminster, the Olympic Park, Enfield, Croydon and Camden, all in 10cm resolution. Eventually it will capture the whole of Greater London, providing the potential benefits of oblique for organisations including the Metropolitan Police, fire services, local authorities and construction industries. Because oblique can be streamed over the internet it also allows increased accessibility for end users. Some sample oblique images of London are presented in this article.

So How Does It Work?

The concept of oblique photography isn't new. Until recently however, the technology required to deliver a useable end product demanded high levels of skill and was very expensive. With the advent of digital cameras and developments in computer software, oblique photography systems have become an accessible and cost-effective tool for professionals in many different fields. With increasing demand for oblique imagery, Getmapping has developed a revolutionary single lens oblique imaging camera system. Using technology utilised by the aerospace and defence industries, it provides increased accuracies and efficiency of data capture. Similar to orthophotographic images the resolution of oblique images depends on the height at which



Trafalgar Square with the National Gallery to the right and Marble arch to the left.

A view of South London showing the London Eye on the Thames River. Below to the left it is the Upstream Building (Shell Centre) and Waterloo Station stretching out in the back.

the plane is flown – this is usually between 1500 feet and 2300 feet.

But where oblique differs to other forms of aerial photography is in the number of view angles used when taking photographs. To get the unique side-view perspective, a single camera inclined at 45 degrees from the horizontal rotates at 90 degree intervals, capturing four images in the compass directions: North, South, East and West. A fifth vertical image is then incorporated into the on-screen user view. Due to the angle of the camera, the ground footprint of the oblique photographs is trapezoidal in shape and because of this, the scale diminishes from foreground to horizon. So, in effect what happens is the top of the photograph is captured at 15cm resolution, the middle somewhere in the region of 10cm and as you move to the bottom it's closer to 7.5cm resolution. In order to create an end-product that will support accurate measurements in three dimensions, the images are individually geo-referenced to produce what appears to be a seamless picture of the area in question.

Getmapping has partnered with software producer Ofek International to use its product MultiVision. It is a multi-perspective on-screen viewing and measurement tool that integrates

oblique and vertical aerial photographs in a single database system. Any computer literate person can quickly learn to use the application and run it from a standard desk or laptop computer. The software intelligently registers the oblique imagery with the 3D coordinates provided by the vertical photography and digital terrain model to create seamless multi-dimensional viewing, navigation and measuring ability.

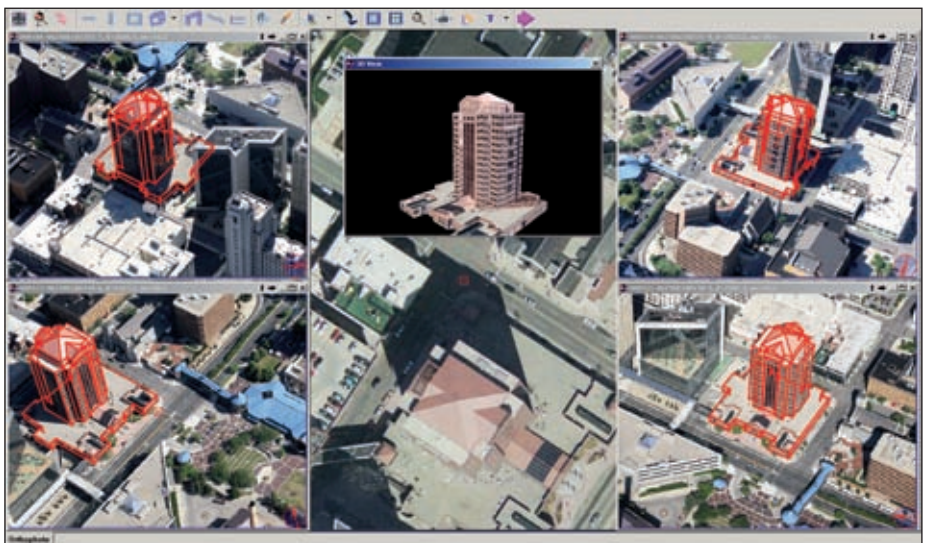
What you see on the screen in front of you are five different synchronised windows: the main section in the centre concentrates on the vertical orthophoto image, surrounding it are the four windows showing the oblique images providing four respective views of the location. Measurements of the different elements can be made directly on the oblique aerial photogra-

phy, whilst other layers of coordinate based information can be inserted and tagged. So when any area of the picture is clicked, the software interprets the data, and allows detailed examination, analysis and measurement without the need to be physically present on site. All measurements are gauged using the ground as the reference point. With the aid of the plumb line tool provided, you can take vertical dimensions and make area calculations to within a 20cm – 30cm accuracy.

Changing Working Practices

Having visual knowledge of a site without being present is a powerful facility, providing critical information for everyday decision making. Oblique imagery offers significant advantages over other aerial photography because it has more versatility and functionality to understand and extract information directly from the images. It reveals building and topographic features that can't be seen using vertical photography. It allows you to pick an area of interest on a vertical image and view it at 360 degrees, zoom in and out of any location, look at height, width, area, elevation, dimensions, inclines and declines. With a simple click you can measure elements of structures, facades, entrances, roofs, windows, lampposts, fences, buildings and boundaries. You can plan access and escape routes, identify missing buildings and structures, retrieve spatial or GIS information and have visual references for planning and making site evaluations.

With a 3D modelling tool you can create 3D building models with coordinates using the industry standard file transfer formats used for 3D objects. There is good integration with mainstream GIS packages that allow overlaying the oblique images with vector files and exporting any dimensional data created such as measurements of structures and elements into GIS pack-



A screenshot with four images in the compass directions: North, South, East and West and a fifth vertical image incorporated into the on-screen user view. On top 3D view is shown.

