

# Leica Geosystems **TruStory** End-to-end Mapping Operations from Ordnance Survey Ireland



**Ordnance Survey Ireland (OSi) is the national mapping agency of the Republic of Ireland. Evolved from the Ordnance Survey Office which was established in 1824, OSi currently employs 320 staff located at its head office in Dublin and in six regional offices.**

Its fundamental mandate is to maintain and develop Ireland's underlying physical infrastructure, including maintaining a national grid and geodetic and height frameworks, and to create and maintain mapping and related geographic databases for the entire Country. Its product offering consists of mapping services, producing a comprehensive range of urban, rural, tourist and leisure maps at a variety of different scales both in digital and in print, to a customer base spanning all sectors of society.

During the 1960's and 1970's OSi carried out a major triangulation of Ireland using WILD Heerbrugg (now known as Leica Geosystems) surveying and

geographical measurement technology.

Colin Bray, Chief Technology Officer, Ordnance Survey Ireland comments: 'OSi saw WILD technology as an industry leader, which combined with high quality local support was fundamental to the successful development of modern mapping operations. Local support evolved and in 1988 Survey Instrument Services Ltd (SIS) was appointed as our key contact for WILD, who were able to provide the level of support and service that was needed to meet our advanced level of technical requirements.'

Since then the technology has developed at a rapid pace, with advancements in photogrammetric and airborne solutions, and the introduction of GNSS to surveying. OSi have fully embraced these innovations and have acquired a full Leica Geosystems end-to-end mapping solution, including: x35 Leica System 1200 GPS and x5 TPS, x17 Leica RTK Network Geodetic GNSS receivers and Antennae as well as software applications including Leica GNSS Spider Software running the RTK

## ■ Scope

To maintain & develop Ireland's underlying physical infrastructure to create & maintain mapping & related geographic databases

## ■ Customer

Ordnance Survey Ireland

## ■ Project Summary

Development of modern mapping operations 1960's – present day.

## ■ Benefits:

- Development of GPS network infrastructure
- Provision of imagery at 25cm resolution for national map updates
- Flood mapping, height data for Ortho rectification, peat quantities & infrastructure design projects
- Map updates, photo control for air-triangulation, ground truthing
- End-to-end mapping solution using:
  - Leica System 1200 GPS & TPS
  - Leica RTK Network Geodetic GNSS receivers and Antennae
  - Leica GNSS Spider Software
  - Leica Photogrammetric Suite (LPS)
  - ADS40 large format digital camera
  - ALS50 airborne laser scanner
  - Leica DSW 700 Digital Scanning Workstations

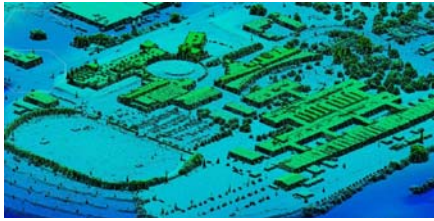
Network. For airborne mapping activities, OSi have the Leica Photogrammetric Suite (LPS) x47 as well as x1 Leica ADS40 large format digital camera, x1 Leica ALS50 airborne laser scanner and x2 Leica DSW 700 Digital Scanning Workstations. In the 1990's OSi were the largest civilian digital photogrammetric production facility in the world.

- when it has to be **right**



## GPS Network Infrastructure

In 1995 OSi established a passive GPS network known as IRENER 95, a year later in 1996 densification took place and in 2001 the network became active through 10 stations, with a beta real-time GRS network in the Dublin area. In 2003 a national beta real-time network was established using the CRNET/Geo++ application software suite, which was upgraded to the Leica Spider system in 2005.



Pictured above: Sample Digital Surface Model (DSM) Isometric view of the Cork Institute Technology produced by OSi

The Active GPS network infrastructure was established to provide a reference solution and RTK correction service for all internal production. The primary use for this infrastructure is to provide the necessary one second data for all airborne operations, with two OSi aircraft operating the ADS40 and ALS50 camera and LiDAR. The network also provides the reference solution for OSi's many field requirements such as map updates, photo control for air-triangulation, ground truthing of all its LiDAR projects and quality checking national mapping.

Bray comments. 'Primarily the field survey equipment is used for national map updates. In the field, our surveyors use a ruggedised tablet PC with an application specifically designed for OSi, this allows the addition of features to an existing map that has been extracted directly from our database. These tablet PC's are connected to System 1200 GPS/TPS via cable/Bluetooth to facilitate ground measurements from our Active GPS Network.'

'The Active GPS Network infrastructure is made available to the commercial survey community through third party providers including Leica SmartNet Network RTK. SmartNet offers full GNSS (GPS and GLONASS) coverage for the whole of Ireland. For end users this means a completely traceable and repeatable network RTK system, using the latest GNSS technology, which is referenced directly to the OSi national infrastructure', states Bray.

## Photogrammetry & Airborne Applications

OSi introduced photogrammetry to its production operation in the mid 1960's with the imagery being supplied by the Irish Air Corps. OSi have been capturing its own aerial photography since the 1970's and was the first organisation in Ireland to introduce digital photogrammetry with the purchase of a digital scanner in the early 1990's.

Since the introduction of the ADS40 large format digital camera in 2005, OSi have been able to provide imagery at 25cm resolution for national map updates and Ortho rectified imagery of urban areas with a 25cm resolution. It has also allowed the film scanners DSW700's to engage on systematic scanning of our film archive into ERDAS GeoVault data management software, which provides automated and accessible long-term storage and management of digital imagery files.



Pictured above: OSi's dedicated twin-engine piper astec for airborne LiDAR

The ALS50 airborne laser scanner is engaged mainly on commercial activities including flood mapping, height data for Ortho rectification, peat quantities and infrastructure design projects. The photogrammetry and remote sensing department primarily uses LPS with the Air Trig application (ORIMA) and the data extraction for map update is PRO 600 embedded in LPS. The LiDAR processing is completed using Terra Solid products.

## Conclusion

Bray concludes... 'OSi have for the past thirty years operated on the basis that we were a technology organisation. We have remained at the leading edge of technology in all aspects of operations. OSi introduced digital mapping into its workflow in the late 1970's and since then we have endeavoured to introduce the most advantageous technologies to OSi as they became available at a practical level. A vision was created then to move away from plastic and paper materials into a complete digital environment. Over the years, as developments have taken place, OSi have consistently evaluated these developments and implemented new technologies where further efficiencies and new products were evident.'

'We see the development of a good relationship being vital to the success of any operation. The support of world leading organisations proven technologies and the dependence of a reliable local partner, such as SIS, is essential. Such relationships have contributed greatly to OSi's success in the mapping industry.'

For more information about the products featured in this case study contact us on +44(0)1908 256500, email [uk.sales@leica-geosystems.com](mailto:uk.sales@leica-geosystems.com) or visit [www.leica-geosystems.co.uk](http://www.leica-geosystems.co.uk)

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