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issue 63 : April 2015

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Unmanned versus manned unwrapped

Open data: a coherent government strategy?
Out with Highland Flings. Angus goes for disco
Geospatial & BIM: can we bring it together?

New column: it's GeoBalls!

Addressing can be an existential problem!
Is GovCo good or bad for open data?
The data or the drone?

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Publishers: PV Publications Ltd
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Printing: The Manson Group, St Albans

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Cambridgeshire and Peterborough Fire Authority has contracted with Cadcorp for the supply of a corporate geographic information system.

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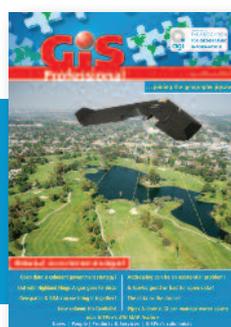
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Next Issue: JUNE 2015

Copy dates **Editorial:** 05 May

Advertising: 21 May



Front cover: What are the advantages of using UAV's over manned aircraft? Bluesky's James Eddy weighs up the pros & cons. **To read more turn to page 20.**

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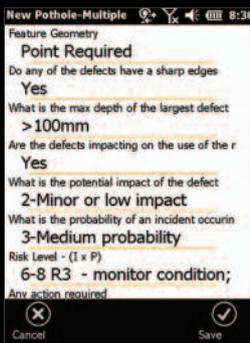
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welcome
to the April 2015 issue of *GIS Professional* . . .

Opportunity knocks

Well, I am back in the editor's chair, for awhile at least. Drop me a line if you'd like to apply for the position. It's not full-time employment, carries no pension and has only a meagre expenses budget and a small honorarium. In return, we offer a great opportunity to get closely involved in geo issues across the board, network and learn what's happening at lots of geo events, meet and question the opinion formers, thought leaders and other shakers and disrupters. The position might suit someone who is already working, perhaps in consultancy, but is not allied to any large supplier or user organisation. Drop me a line to steve@pvpubs.com. Meanwhile, **Robin Waters** is reverting to his previous role as Features Editor and I thank him for what he has done over the last three years in raising the pace and topicality at GiSPro.

Talking to **Vanessa Lawrence** a little while ago she was firmly of the view that government really has got the message about geodata. Most branches of government, national and local, now understand that everything happens somewhere and recording its location is worthwhile. But does government understand that addressing is not just a database of house numbers with postcodes? I suspect not, as **Ian Coady** of the Office for National Statistics points out in his column "An insider's view on... open" (page 27) As our politicians have struggled to grasp and resolve the anomaly of having three different government address datasets, we now have the creation and funding of a fourth, to be free and open to all and relying on voluntary data contributions. As Ian argues, what we really need is a government strategy for consolidating the datasets that haven't been sold off and making them open.

As we reported in the last issue (*GiSPro* February 2015), Ordnance Survey is changing its trading entity to that of a government owned company. I am delighted to publish a detailed analysis and discussion of what this may mean for the mapping agency and its customers. **Ellen Broad** of the Open Data Institute sets out the key questions to be answered and provides some of the answers (page 12 Is OS GovCo good or bad for open data?). Let's hope that **Carol Tullo's** assertive comment is fulfilled: "... ensuring that the data remains Crown owned is the public commitment that will be delivered."

With predictions that spending on UAVs will double in the next ten years, two articles highlight firstly that it's the data where the focus needs to be (page 22 It's the data not the drone), while **James Eddy** of Bluesky compares the licensing, training and legislative regimes, together with the applications, for both fixed-wing piloted aircraft and UAVs. He also wonders whether a more realistic competitor to both technologies may eventually be satellite imagery, if it can one day match temporal frequency, control and spatial resolution.

Christine Easterfield of Cambashie sounds a cautionary note for those too deep in the GIS woods to see the trees (page 28 Geospatial and buildings: can we bring it all together?). Can we really bring GIS and BIM together? She reminds us that the GIS companies are dwarfed by the likes of Autodesk, Bentley and Dassault Syst me. The latter perhaps not showing on your radar but massive in manufacturing CAD. The key game changers and drivers could be the coming so-called smart technologies like energy generation and occupancy and travel patterns.

A new feature in this issue is a double-page map (pages 18 & 19). The first (and probably not the last) comes from **BrilliantMaps.com**. If you know of other maps that add real insight to the world and demonstrate the power of GIS and cartography which impart information, drop me a note at steve@pvpubs.com.

Finally, this publication is largely an election-free zone. But we do just allude to it in our new GeoBalls column (page 8). The author is a seasoned if somewhat jaundiced viewer of the geo scene, who can even remember the first AGI conference in Brighton in 1989.

Stephen Booth, Editor



... we really need... a government strategy for consolidating the datasets that haven't been sold off...



OS Open Map – Local launches



OS director Peter Ter Haar shows the latest datasets to Business Secretary Vince Cable.

Ordnance Survey has announced OS Open Map – Local in beta, the most detailed open data product to date. The vector dataset can provide a backdrop for integrating and visualising analytical datasets. It comes with an enhanced level of detail for buildings – including functional sites such as hospitals and schools, an extended naming of roads and an extensive set of cartographic names optimised for digital styling and presentation. Designed to work with other OS OpenData products, it will be available in GML 3.2 and ESRI Shapefile formats. OS say they have developed it following feedback from the OpenData User Community who asked for greater flexibility, more building detail and more options for customising the data.

“We anticipate a wide range of uses for the dataset, across public sector and commercial enterprise” said an OS spokesperson, citing that it could provide a locational backdrop map to compare sites and display third party datasets, simply. “In retail, this could help a business to choose the right place to locate a new site. Imagine a global café chain wanted to find the best location for a new food outlet, wanting a vacant space with a suitable potential customer base and knowing where their competition lies. Using OS Open Map – Local, they could overlay demographics for neighbourhoods such as employment, crime and education rankings, as well as the location of existing food outlets. The absence of competitors may indicate that the area is completely unsuitable for the type of premise they are planning, whereas the presence of some competition tells them that their type of business could thrive in that area if they can depose the competition. Crime rankings would be of interest to see if insurance premiums might be too high.”

Annual Exemplar Awards

GeoPlace has opened up its annual Exemplar Awards programme to local authorities who use address or street data in innovative ways. The awards highlight best practice in local authorities using land and property and street information to tie different services from across

organisations together to give a ‘property level view of services’. Outputs from the awards are used to demonstrate best practice right across Great Britain. They are also used to underline the importance of sharing data using existing council resources.

Keynote speakers this year include Cllr Jason Kitcat, leader of Brighton and Hove City Council, who will give his thoughts around ‘Local

authority data-sharing & digital transformation’ and Paul Baden from the Department of Transport who will discuss ‘Delivering the next generation of road mapping for England and Wales’.

This year there is a special award, sponsored by the Local Digital Campaign, for the ‘best example of innovation in local digital services underpinned by local address/street data’. The Department for Communities and Local Government campaign fosters sharing and co-creation among local and central government around the use of digital tools and expertise to improve public services. A key focus for the judges will be a demonstration of both savings delivered and collaboration across services or organisations, whilst meeting a clear user need.

Other categories this year include: Exemplar Award, Local Digital Award, Peer Award and Data Quality and Improvement Awards. The Awards will be presented at GeoPlace’s annual conference and exhibition on 19th May at Edgbaston Cricket Ground in Birmingham. More at: www.geoplace.co.uk

More open data from OS

A report on the website UKAuthority.com states that Ordnance Survey has launched a new set of street level data, OS OpenMap, which will be available for developers building new products. Restrictions on the re-use of so called derived data, which is used in products sold by developers but originated with OS, have long been a focus of complaints from the geospatial technology industry.

Although not explicitly mentioning derived data, OS has said it is committed to improving its licensing terms to encourage re-use. Neil Ackroyd, acting director general and chief executive, adds: “At Ordnance Survey we believe that open

data releases are best supported by additional resources and we have explored ways to improve and modify our licenses and provide supporting initiatives to aid further innovation.”

OS will also set up a Geospatial Innovation Hub to provide a space for it to meet face-to-face with developers, provide advice and support the creation of new products and services, building on its experience of the GeoVation programme.

The announcement was hailed by business secretary Vince Cable, who said: “Making this data more accessible means more small and medium companies will be able to use Ordnance Survey’s world leading maps, combining geographical data from multiple sources and visualising them at a high level of detail. I am sure this will inspire a number of companies to create sophisticated new products.” More at www.ukauthority.com

OS has also provided details of other new open data products: an Open Water Network covering Great Britain’s rivers; a new Gazetteer; and the release of unique property reference numbers (UPRNs) on a royalty free and open basis.

OGC seeks comment on 3D portrayal

Open Geospatial Consortium is seeking comment on its candidate OGC 3D Portrayal Service (3DPS) standard, which is aimed at achieving interoperability between soft-wares for airborne and mobile laser scanning, photo-grammetric methods for terrain data and detailed 3D models of the built environment. OGC has been working with the Web3D Consortium to address the need for interoperability, as well as the content challenges of volume, access speed, and diversity of devices. While Web3D has focused on open standards for real-time 3D visualization, including streaming, OGC has focused on developing a

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service interface to provide interoperable access to 3D geospatial data servers.

OGC has also announced the Unified Geo Data Reference Model for Law Enforcement and Public Safety as best practice, providing guidance for law enforcement, civil security and public safety organizations developing applications from mobile to enterprise systems that require communication and data sharing between many, often geographically distributed, users. The move, which also triggered an announcement from Esri and Intergraph that they are "collaborating to enhance geospatial capabilities for public safety and security agencies", defines a data model for encoding spatially enabled data so users can easily and effectively share law enforcement and public safety data across jurisdictional and national boundaries. More at: <http://www.opengeospatial.org/standards/requests/130>

Off-the-shelf move for Herts Council

North Hertfordshire District Council (NHDC) is migrating from bespoke web mapping to an off-the-shelf application from British software developer, Cadcorp. The

upgrade will make interactive web mapping available to more than 300 council employees who already use it on a daily basis on tasks as diverse as querying land ownership to planning the location of polling stations. NHDC's GIS manager, John Barnacle, explains, "The council licensed Cadcorp's geospatial web services engine, GeognoSIS, in 2005 and Cadcorp developers built us an associated web-mapping application to our own specifications based on that engine. The application has served us well for the last ten years, both as a public-facing website, and as a back-office application. However, we are constantly reviewing our IT infrastructure, and we have decided now is the time to make a step change in our investment in GIS. We will be replacing a bespoke 32-bit web mapping application with a 64-bit version of Cadcorp's off-the-shelf product – Web Map Layers 8.0. It will bring us new functionality, a modern and responsive user interface, and we will have future-proofed our investment in GIS."

Web Map Layers will be managed from the council offices in Letchworth, a town of 33,000 people and the world's first Garden City. The management of

green space continues to be a council priority, explains Barnacle: "Our grounds maintenance contractors are enthusiastic users of web mapping in Letchworth and elsewhere. When we ask them to maintain playing fields, for example, they will go to the web. . . identify the location, measure the land area to be treated, and calculate the amount of fertiliser to be applied. They are able to create maps as PDF documents and share these electronically with their workforce. For example they will be able to view and query map data online in the field using smartphones and tablets."

BRIEFS



Ordnance Survey has a new logo. Mercifully it seems we've been spared a press release announcing it or worse describing it in a torrent of PR psycho babble. It's actually rather cute!

Registration is now open for Esri UK's annual conference. Set for 19th May at the QEII Conference Centre in Westminster, this year's event is expected to attract a record number of delegates.

More at <http://www.esriuk.com/events/annual-conference-2015>

A new website (www.MapMyRights.org) is soon to be launched and will include research results from the "Crowdsourced Land Rights" working group of FIG Commission 7, led by **Robin McLaren**, Director of Know Edge Ltd. Robin will continue to provide management consulting services worldwide in the land policy, land administration and GIS domains through his consulting company.

1Spatial plc is acquiring a substantial share in its US partner Laser Scan Inc. The move will help 1Spatial develop key sectors in the US and throughout the Americas, strengthening it with additional services and products such as 1SMS solutions and services.

Ministerial approval has been given by transport minister **Robert Goodwill**, for Ordnance Survey to work with GeoPlace, the Department for Transport and other stakeholders to develop a new range of Highways products that combine the best of data submitted by local authorities through the



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An occasional column where we highlight some of the weird, bizarre, quirky and downright dumb geo stuff that comes over the ether to us.

Did you miss "International Drones Day" on Friday 13 March? So did I. I've no idea who dreamt it up or why, but it encouraged a gushing press release from a PR company acting on behalf of a major developer of UAVs. What next, a thermal imaging day?

This next item is geo-related in so much as you may recognise the company culture. Take a read of: <http://adequatemanager.deadspin.com/how-to-survive-your-first-tech-job-1687097002> There is good advice for those embarking on a career in big tech. Reminds me of some of those ideas that were going around in the 90s on how to make an impact at a meeting. One was, plunge a large Bowie knife into the table with the words, "Let's get this sucker started!" Less dramatic but equally alarming was to turn to the person next to you and whisper "I see dead people".

The BBC's website has a great article on a new island arising from a volcano near Tonga [www.bbc.co.uk/news/world-asia-31848255]. Alas an accompanying map was rather less informative. It showed the chain of islands but an inset cartouche of Australia and New Zealand gave no clue as to where the islands were located. Perhaps it was for scale, like those huge chunks that break off the Antarctic ice shelf the size of Wales. In which case Tonga occupies much of New South Wales, South Australia and Victoria.

With a general election looming you may want to check out your favoured candidate's geographical knowledge. Our cousins across the Atlantic are a regular source of shaky geography. Some years ago presidential candidate Sarah Palin thought Africa was a country, while a reporter once asked a passer-by which country America should attack next (following Iraq and Afghanistan). The hapless individual confidently said France and identified its location as Australia on a world map. More recently, senator Tom Cotton lambasted Iran with the thoughtful insight that: "They already control Tehran". To be fair, I suspect many Brits are just as ignorant, but we don't usually push ourselves forward to be the people's representatives.

National Street Gazetteer (NSG) and the OS's Integrated Transport Network (ITN) product. The move is aimed at enabling better planning, management and more informative routing options across the road network.

Thanks to a new website called the National Land Use Planning Portal (NLUPP), Rwandans connected to the internet have access to land-use plans and other spatial data, reducing the time it takes to find maps and documents. Built on Esri's ArcGIS platform by the Rwanda Natural Resources Authority with the support of the US Agency for International Development the portal is the first of its kind in Africa.

Hazard modelling specialist JBA Risk Management and emapsite have broadened their partnership to offer a wider choice of flood risk data. Insurers, underwriters, loss adjusters and claims managers are among those set to benefit from wider availability of JBA data through emapsite's 'Data as a Service' (DaaS) on-demand location content platform. Newly-available JBA data includes Annual Damage Ratio, the European Flood Model and the Global Flood Map.

eSpatial has won a place on the UK government's on-line procurement agreement, G-Cloud 6, operated by the Crown Commercial Service (CCS). Public sector bodies can now trial and purchase eSpatial online mapping software on G-Cloud's Digital Marketplace. eSpatial can be found listed in the 'Software-as-a-Service' section.

PEOPLE

Nigel Clifford, who has a geography degree from Cambridge and is a Fellow of the Royal Geographical Society, is the new chief executive of Ordnance Survey. He takes up

leadership of the £145m turnover organisation in June, succeeding Neil Ackroyd who has been acting CEO since **Vanessa Lawrence** stepped down last year. Clifford has held similar roles with Proserve Holdings, Micro Focus International, Symbian Soft-ware, Tertio Telecoms, Nokia (senior vice president), Glasgow Royal Infirmary University NHS Trust and various senior roles in Cable & Wireless and BT.



Following an open competition overseen by the Civil Service Commission, **Graham Farrant** has been appointed chief executive and chief land registrar for the Land Registry. Farrant, who replaces **Ed Lester**, is currently chief executive of Thurrock Council and recently took on the same role at Brentwood Council. In the recent past, he also held the chief executive role on an interim basis for the London Borough of Barking and Dagenham.

thinkWhere has appointed **Bruce Beveridge** as a non-executive director and chair. He has extensive senior executive and board experience with a career which has included the Government Legal Service for Scotland and roles as Legal Secretary to the Lord President of the Court of Session, Deputy Keeper at Registers of Scotland and Head of Rural Communities at the Scottish Government and until recently was President of the Law Society of Scotland.



Carol Agius has been appointed Administrator for the European regional committee of the United Nations Initiative on

Global Geospatial Information Management (UN-GGIM). Carol, who is from Malta, has extensive experience of leading multi-national expert groups having been Chair of EuroGeographics' Quality Knowledge Exchange Network for seven years. She was a key organiser of the recent International Workshop on Spatial Data and Map Quality, has post-graduate degrees in both GIS and Strategic Quality Management and is also a chartered geographer with more than 20 years' involvement in the geospatial community.



Three recent appointments at Getmapping include **Carl Greenman** who joins as a geospatial specialist. Previously Carl worked as a GIS surveyor for a housing association as well as a stint with Bath and North East Somerset Council. Meanwhile, **Asim Malik** joins as an IT infrastructure support engineer and **Fiona Kent** is Getmapping's new marketing manager. With over 20 years B2B marketing experience she has worked with brands like the AA, Centrica, CORGI and Towergate.

Han Wammes has joined iSpatial as business development manager. He joins from Oracle and Intergraph and has been assigned to help grow the company's business in the Dutch market and Smart Cities arena. Wammes brings with him over 30 years of experience in GIS and IT technology, as well as industry knowledge and enterprise architect skills. His experience lends itself to opening up geospatial information-lifecycle-management discussions, with enterprises dealing with quality and interoperability issues.

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Adena Schutzberg has worked in geospatial technologies for 25 years and is principal of ABS Consulting Group, www.abs-cg.com, adena@abs-cg.com

IT'S BEEN SEVERAL MONTHS since a "big" acquisition in the geospatial industry. Uber, the well-known mobile-app-based transportation company, acquired deCarta, a small independent mapping and spatial analysis software company.

The acquisition reveals several truisms about the state of our industry. I want to highlight them here because we as insiders sometimes cannot see the business forest due to the technology trees.

All companies are tech companies A few years ago Tom Foremski and others began arguing, quite correctly, that all companies are media companies. It's equally true that today all companies are technology companies.

If there was a scale that measures how much a business' success depended on technology, I'd estimate that UPS (a package delivery company founded in 1907), Amazon (founded 1994), and Uber (founded 2009) come in at roughly 90%. Jack Levis of UPS memorably stated that the company evolved over time from a trucking company that used technology to a technology

current merger and acquisition advisor made the point in his coverage that what Uber acquired, the unique deCarta algorithms, are the secret sauce of geocoding and routing. Those bits of code are what will distinguish Uber from any other provider building on Google Maps or Esri's APIs or any other mass market solution available.

The flip side of Prioleau's point, and this one is mine, is that Uber did not buy a geographic data company. In fact, no one is buying geographic data companies these days. Despite some arguments in recent years that it might be a wise move (in particular that Apple should buy TomTom or HERE) the data parts of TomTom and Nokia remain where they've been for some time. In contrast, data collection companies that offer planes, drones, satellites, and sensors are in flux: Google acquired Titan and Nest; Trimble acquired Gatewing, and Microsoft acquired Vexcel. Even smaller players, like Chantilly, Virginia-based defence and intelligence contractor OGSys acquired Urban Robotics, a

The state of geospatial: revealed as Uber bags deCarta

Just how old do you have to be to remain a startup? Adena Schutzberg reveals the "secret sauce" in the deal and asks, is anyone buying geographic data companies?

company that just happens to use trucks. Amazon and Uber, in contrast, were born as technology concerns. My local coffee shop and hair salon are perhaps tapping just 10% technology, but that percentage is growing. Both chains recently stepped up their use of technology for marketing and customer retention and are gathering personal details to use to offer incentives.

Mapping startups *TechCrunch* hosted the most cited article I found on Uber's March 2015 acquisition: "Uber is Buying Map Tech Startup deCarta In An Undisclosed Deal." Several tech watchers inside our industry questioning the use of the term "startup" to describe 19 year old, 40 employee deCarta. I certainly don't consider the company that was part of the original Google Maps implementation a startup!

I think *TechCrunch* stated what most people outside of our industry believe: any organization that's not the Ordnance Survey, National Geographic or Rand McNally is a mapping startup. Why? Mapping companies like TomTom, Nokia, Esri and Google didn't hit many people's radar until a few years ago, despite their decades of mapping and technology advancement. For better or worse, mapping, especially with computers, is still considered something new.

developer of camera systems and software for drones, are getting into the act.

Form relationships, but plan for a backup The fact that every company is a technology company is making for some complex relationships in the marketplace. Uber, it's reported, uses both Google's and Apple's mapping technology at this time. Google is an investor in Uber. But word on the street is that there is friction in the relationship. It makes sense, then that Uber consider building its own mapping technology infrastructure, just in case the Google and/or Apple relationships end.

Uber can, and perhaps did, learn from Apple. The company had a collection of mapping companies on board when Google and Apple went their separate ways, a parting something many suggest was years in the making. Clearly, a partner's decisions can throw a wrench in a relationship; having a "hot spare" solution that can be pressed into service is becoming a necessity.

Perspective One of the challenges of working in a small, tight-knit industry is that our observations can be tied to technology details rather than the larger business perspectives. When well-known companies launch geospatial technology products or make acquisitions in the field, we have a unique chance to see how our all-to-familiar industry looks from the outside.

Algorithm secret sauce matters, data does not Marc Prioleau, a former deCarta employee, and

“

... a partner's decisions can throw a wrench in a relationship; having a "hot spare"... is becoming a necessity.

”

Open Data and Ordnance Survey



ODI dashboard with their lifetime company stats displayed.

ON 22ND JANUARY 2015, THE UK GOVERNMENT announced plans to convert Ordnance Survey from a trading fund to a government-owned company (GovCo). In response to questions posed by Labour MP **Chi Onwurah**, minister of state for business, enterprise and Energy **Matthew Hancock**

confirmed that the transition will be completed by the start of the new financial year, i.e. April 2015.

Views on social media and in reports since news broke of the transition have been mixed. Some see this as a positive step forward, freeing up Ordnance Survey to be more flexible in how it conducts its business. Others are concerned that this could result in valuable UK geospatial data, which has been paid for by the public, never being made available as open data.

outlining the options they've considered for converting to a GovCo. They might have looked at the legislative quagmire in which the Highways Agency found itself during the passage of the Infrastructure Bill to effect that conversion and decided that a non-legislative route would be faster and better for staff certainty and continuity of operations.

What's unclear, though, is the thinking on the potential costs associated with a non-legislative route, particularly when these were deemed too significant for the Highways Agency. It does leave unanswered questions:

- Is this an interim measure? Will a legislative underpinning come later?
- How will the government's role and powers over the GovCo be defined?
- The government has confirmed Ordnance Survey will be 100% government owned. Will it always be 100% government owned? Is there a plan to introduce other shareholders?
- **Can the impact assessment be made public?**

Is OS GovCo good or bad for open data?

Ellen Broad, Policy Lead at the Open Data Institute (ODI), examines the conversion of Ordnance Survey from trading fund to government-owned company (GovCo). In particular, she answers some questions about OS open data but poses some more.



With no legislation needed for the change, lots of governance details about the transition are – and will likely remain – unclear. However it's important to note that alongside the Ordnance Survey's GovCo announcement they've also made a number of positive announcements concerning open data.

Their OS OpenData Licence is to be replaced by the Open Government Licence v3.0. This is a great step forward, enhancing the usability of OS open data products. In the meantime, this article answers some basic questions about the transition from trading fund to GovCo, and poses some questions of our own.

What's the difference between a GovCo and a trading fund? A government-owned company is an entity that undertakes commercial activities on behalf of an owner government. A government agency might become a GovCo so that it can pursue commercial objectives more freely or to improve efficiencies and value for money of delivery. It might also become a GovCo with a view to eventual privatisation – selling off GovCo's is often a way to pay down government debt.

In practice, trading funds display most of the same characteristics as government agencies. However, their accounts are not consolidated into the accounts of the department (in Ordnance Survey's case, The Department for Business, Innovation & Skills) and they can use their receipts to meet their outgoings.

Who will own copyright in Ordnance Survey data? In a written statement announcing the change, Matthew Hancock stated that Ordnance Survey will remain under 100% public ownership, with the data remaining Crown property. But what about copyright in any future data created by Ordnance Survey?

It's not clear if both existing OS data and any future data created or updated will be Crown owned. If up-to-date/enhanced geospatial data is GovCo owned, rather than Crown owned, it could be vulnerable to eventual privatisation.

For example: OS MasterMap, Ordnance Survey's most detailed mapping database (and the basis for all

Why doesn't the conversion require legislation? A new legal entity can be created without legislation to take over the functions of Ordnance Survey. This is a lot faster than via underpinning legislation: a company can be set up and registered with Companies House "almost instantly".

Interestingly, when the conversion of the Highways Agency to a government-owned company was announced, the government considered both options. In that case, they decided that converting to a GovCo without legislation was too risky: "The lack of legislation would not give sufficient confidence for the reformed Highways Agency or the supply chain to deliver real changes. . ."

So why has Ordnance Survey gone down this route? There'll be an impact assessment somewhere



This is a great step forward, enhancing the usability of Ordnance Survey open data products.



its other products), would be Crown-owned at the time of transition to a GovCo. However, if MasterMap is maintained and updated by OS as a GovCo, will this mean that intellectual property (IP) in the data is half Crown-owned and half GovCo owned? What will that mean for re-users?

Questions to be answered include:

- Given the intention is for the data to remain Crown copyright, through what legal mechanism will that happen?
- How will ownership of IP in future data created by Ordnance Survey be dealt with via that legal mechanism?

In response to these questions we have a blogpost from **Carol Tullo**, Director of Information Policy and Services at the National Archives (and controller of HM Stationery Office) – “Let’s be very clear - ensuring that the data remains Crown owned is the public commitment that will be delivered.”

Will OS be required to comply with government information policies as a GovCo?

In his written statement, Matthew Hancock mentions that Ordnance Survey will continue to subscribe to the Information Fair Trader Scheme (IFTS). The IFTS is an administrative best practice scheme administered

by the Office of Public Sector Information (OPSI). It has no legal underpinning – in other words, there are no real consequences if OS decides not to subscribe to the IFTS, or contravenes it.

Interestingly, it’s also not clear whether, as a GovCo, OS would be bound by the upcoming changes to UK Reuse of PSI Regulations, due to come into force this year. These changes will make decisions about reuse of public sector information legally binding.

In other words, if a tribunal/other panel decided that OS should have permitted certain use of their data, OS would have to do as the tribunal says. As a GovCo however, they may be outside the scope of these changes: the existing reuse of PSI regulations don’t seem to extend to GovCos.

Will OS be obliged to comply with decisions made under the updated PSI regulations? What about FOI laws?

The conversion of OS to a GovCo may end up having no real impact on the availability of open geospatial data. At this point in time, it’s hard to draw any conclusions. Ordnance Survey is expected to make more announcements in the near future about planned open data releases, while they finalise their GovCo arrangements. Hopefully more details of the transition itself, and answers to some of the questions posed in this post will also be announced before the transition is finalised.



About the author

Ellen Broad joined the ODI in September 2014 as Policy Lead to distil the knowledge and expertise from the ODI’s team. She authors documents to influence government policy, provide advice to government and the private sector on how it can capitalise on open data, and engage broadly on issues affecting access to and re-use of data.



DynamicMaps

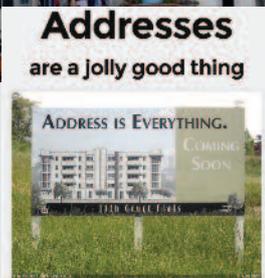
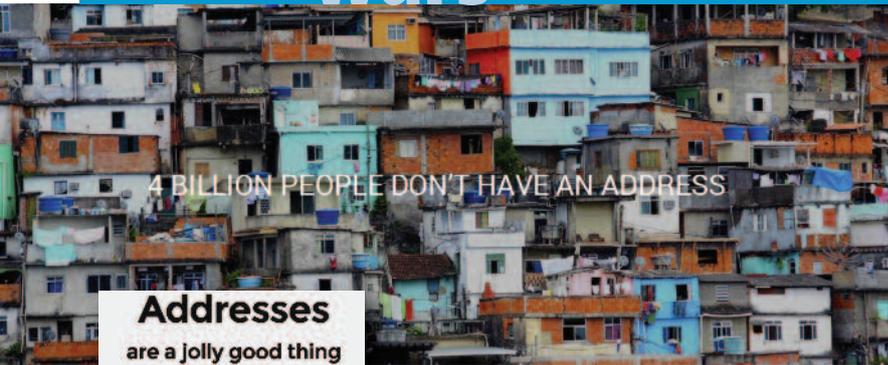
A **cadline LTD** BRAND

DynamicMaps Suite of GIS solutions for Government, Infrastructure, Land & Property and Gazetteers:

- Powerful Web GIS
- Mobile, Capture and Report It
- INSPIRE accredited module
- GML Translator
- GeoCoder
- BS7666 compliant Address & Street Manager
- QGIS, OL3 and GeoServer Consultancy Services



Address wars



STEVE COAST (FOUNDER OF OPENSTREETMAP) said last year that “Address data is really the most important and interesting thing to work on [right now]” (Techcrunch 2014). Did this event support this comment? Arguably, yes. But it might depend on where you live or work.

In the UK and most of the developed world we take it for granted that we have an address which we use as part of our identity – for passport, driving licence, delivery, emergency service access, etc, etc. We don’t give it a second thought unless it is to make

and longitude, which runs to about 18 digits, that will locate their home uniquely to anyone with a GPS or a web map service. So how do we achieve an internationally acceptable address for anyone, anywhere?

Two of the presenters addressed this as an international problem; the other two stuck to the UK. All of them were forced to discuss the issues of access, open data and costs. **Jenni Tennison** (Open Data Institute) kicked off with her heartfelt plea to back the Open Addresses initiative recently launched by the Open Data Institute with the backing of Cabinet Office funding. She believes that addresses are a ‘public good’ that should be made available to anyone (individual or organisation) that can make use of them – whether for profit or not. In Denmark there has been a ten fold increase in the use of address data since it was made open and the benefits exceed costs by a factor of 70.

The current UK position is that a start-up company building an application needing address data faces prohibitive costs and prohibitive licensing complexity, not to mention potential competition from the monopoly data providers. Many people think that the sale of the

Addressing can be an existential problem!

A recent joint AGI/British Computer Society Address Day provided several perspectives but none more important than the difficulty of establishing an identity without an address. Around the world four billion people do not have a legal identity and cannot establish one without some form of address. Lack of an address is an existential problem. The UK ‘address wars’ are trivial in a global context, says **Robin Waters**.

sure we have the right postcodes for our satnavs or to rail at the mismatch between our administrative and postal boundaries! And we don’t have to pay for our individual address – it is created by our local authority, given a postcode by Royal Mail and geocoded by Ordnance Survey. Its structure seems, usually, completely logical – house name/number; street name; locality; post town; postcode.

We may complain about the county no longer being required by Royal Mail or that we shouldn’t use a vanity locality to give us higher status, but we do have an address that any organisation can check and verify for application forms or on-line orders. Providing, that is, that they pay a fee to use the address databases provided by Royal Mail or the Ordnance Survey. Individually we are free; institutionally we are licensed and restricted.

A roof but no address But, as **Anthony Beck**, from the University of Nottingham explained, there are four billion people in this world who cannot claim a unique address, much less have it codified and made available for identity checking or delivery of goods or services. Most of these people actually have a roof over their heads and can show you where it is. It will have a GPS measured latitude

Postcode Address File with Royal Mail was a mistake and that, combined with the Ordnance Survey pricing and licensing regime, it is important to try to set up an Open Data alternative to PAF or the AddressBase products.

Infected by existing IPR could leave you barking Jenni would much prefer that the government took action to provide these ‘definitive’ datasets on an Open Data licence so that everyone can benefit and she is quite sanguine about the difficulties of achieving the Open Address goals in any reasonable timescale. It will only be achieved if substantial chunks of address data can be sourced from individual inputs prior to verification against any of the PAF or AddressBase products. Organisations (companies, charities, etc) can provide raw data from addresses captured on their websites before it is ‘infected’ by existing IPR. To start with many addresses will be inferred from the data available and her graph shows the database reaching 80% of the 25 – 30 million target within 12 months.

It is clear that a considerable amount of effort is going into trying to gather, match, validate (in so far as that is possible) and infer or interpolate missing addresses. Many in the audience were rather sceptical. Even Jenni herself admitted that this is a ‘second best’



So how do we achieve an internationally acceptable address for anyone, anywhere?



solution that can never be definitive. She also deliberately declined to define an address and admitted that the initial offering would not include geocodes. How would the Open Addresses be paid for? By so called 'Freemium' services such as validation, auto-completion and geocoding. One member of the audience described the exercise as 'barking mad'!

OS and Geoplace's answer Chris Chambers (Ordnance Survey & Geoplace) put the case for the latest OS products that incorporate PAF and claim to be as good as it gets for UK addresses. He was not fazed by his products having been described as infectious but boasted of the nearly 40 million addresses now available from AddressBase Premium. He insisted that licensing terms are relatively relaxed and that all public sector organisations have access 'free at the point of use' including the facility to share with other organisations where required. There are no plans, at the moment, for a centralised address service. But there are plans for more frequent updates than the present six-week cycle but he made the point that partners and customers cannot be forced to keep up with any particular update regime.

What are your magic words? Looking further afield were Anthony Beck and **Tim Williams** from What3Words. Anthony introduced DAIS which stands for 'Determining Addresses which are Independent of infrastructure using a Spatial algorithm' which 'can be used as a benchmark to evaluate technology candidates'. But this is the technical side of addressing which, whether it is a national or international system, should meet some basic criteria for spatial referencing, transparency and accessibility.

There are several candidate systems which claim universality: from the Maidenhead Locator System (are you a radio ham?) through GeoHash, MapCode and the Natural Area Code to What3Words of which more later. Most of these translate a latitude and longitude into alphanumeric codes which are much more difficult to remember than the average UK postcode though they do provide a higher resolution. None of them have taken off to any extent except in specialised applications (like radio amateurs) – I guess a good analogy might be with Esperanto v English. Any system has to compete with ubiquitous WGS84 datum lats and longs available from every GPS enabled device on the planet.

What3Words started two years ago because **Chris Sheldrake**, the founder, couldn't communicate the exact venues (often in out of town fields) to the rock bands that he managed! Tim Williams explained that the 'three word' format enables anyone to communicate – by any media – a location that is accurate to a 3 x 3 metre square anywhere in the world with three English words. These three words will always be more easily memorised than 18 digit coordinates or 7 or 8 digit meaningless strings of characters. To find your location words just go to the What3Words website and find your location on

the Google Map window. Anyone can then find it for themselves if you have shared the three words by email, in print or by word of mouth.

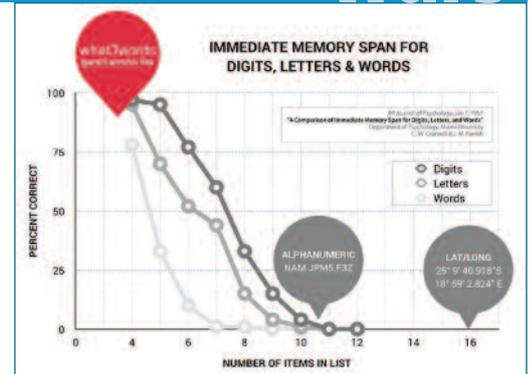
Thus the PV Publications office in Stevenage can be addressed as 'paint.goal.meant' while our proprietor lives at 'debit.agreed.stones' while a car in his drive might be at 'scales.tube.chemistry'. The squares are also labelled in 22 other languages including Arabic and Chinese. There is no cost to the casual user and only a nominal charge for a 'one word' solution that you can buy (I did!) but which is now being 'de-emphasised'.

The core algorithms and data are proprietary although use of the system by individuals is free and will remain so. The company is committed to putting these in the public domain if ever they are unable to maintain them or unable to hand over to a third party that can make the same commitment. The company prices its technology to match the need and the resources available – it is less expensive in 'low income countries' and for aid agencies. If you think this idea is whacky then think again. It was presented at the Esri Federal GIS Conference in Washington earlier this year and **Steve Ramage** – previously of Navteq, 1Spatial and Ordnance Survey – is now their director of strategy.

Enthusied or confused? I came away from this meeting enthused and confused. Enthused by the importance of addressing and the evident innovation from some. Confused by our government's total schizophrenia. Are individuals' addresses vital to their very existence? Clearly they are. Are lists of definitive addresses a 'public good'? There is no doubt in my mind that they are. Should we therefore privatise and/or monetise them in monopoly organisations? Well we have done! Will we ever scrap our street address for three arbitrary words? I doubt it. Could the rest of the world do better with managing their address infrastructures than the UK? They ought to, but with politicians' dogma and entrenched profitable monopolies, don't bet on it.

At the final panel session Tim Williams suggested that What3Words might not succeed as a company but that they would at least leave a 'good looking corpse'! I don't think we can be so sure about Open Addresses Ltd which really does seem to have set itself a very steep mountain to climb. And lest I sound too cynical I should report that a show of hands at the end of the meeting overwhelmingly supported a statement that the addressing scene in the UK had improved over the last five years.

See more at: <http://www.agi.org.uk/news/agi/674-bcs-agi-one-day-meeting-on-addressing-5-march-2015#sthash.g5AOwj5y.dpuf>



Any system has to compete with ubiquitous WGS84 datum lats and longs available from every GPS enabled device on the planet.



Pipes and drains

The numbers say it all

First 8 months	Surveys added to GIS	GIS Technicians	Surveys rejected
Blackline	6000	1	95
Redline	4900	3	300

- Feedback from field crews is good
- We know who submits a survey
- We can respond to poor work quickly & effectively

South West Water results of field data capture trials.

THE AGI'S ASSET MANAGEMENT Special Interest Group (SIG) was highly active throughout 2014 with a series of half-day seminars centred around three key themes: transport, energy and water. Most recently the SIG brought together four speakers from the water industry to provide an insight into how asset data is collected, visualised and analysed. Two of the speakers from water companies (South West Water and Wessex Water), the third speaker was from Arup but was representing Welsh Water and finally the academic

office not only makes the person collecting the data much more accountable, but the systems are in place to help reduce errors at the data input stage.

Andrew Pennington from South West Water (SWW) introduced their approach to "black lining" using Intergraph's G-Mobile data collection environment. The user is able to view property level mapping and the existing digitised sewer network, so that the precise route of a previously unmapped sewer can be added directly into the network. This is complemented by mandated attribute fields to ensure that the understanding of the asset stock at a base level (e.g. material, diameter) is complete.

This new approach to data collection for SWW, required significant investment in hardware and training. The key benefits of this approach are more complete and consistent asset attribution that, once returned to the central server, with simple quality assurance procedures, is of a standard permitting the network to be updated immediately. No re-keying is

GI and water asset management

Most pipes and drains are underground and under-mapped. They are subject to potential damage from human activity as well as from natural hazards such as soil movement and chemical corrosion. **Jeremy Hilderley** reports on a seminar organised by AGI's Asset Management SIG that brought together water companies, a consultant and a soil science expert.

world was represented by Cranfield University.

All UK water companies are required to submit a business plan for AMP6 (Asset Management Period 6 2015 – 2020). Through the business planning process, each water company has set performance targets in relation to outcomes. Each target comes with a measure and of course an incentive. Many of those targets have pain/gain financial incentives; but some are simply about maintaining a reputation. Many of the outcomes reflect the increasing service demands from customers and pressures on the environment, so the emphasis is on delivering effective operational and asset management. Decisions made by operational and investment managers must deliver outcomes that reflect customer and stakeholder values in the short, medium and long term.

Water companies were given a broad brief for the seminar: "Talk about something related to geo-spatial that helps the business manage their assets. Speakers get the best feedback when they just share their approach to solving a problem".

Mobile comes of age What became immediately apparent from the talks given by South West Water, Wessex Water and Arup was that mobile solutions are coming of age. Mobile data collection has been used for some years, but methods for data collection are becoming smarter. The process from field to

required in the office. If a return fails the quality checks, any queries can be made quickly and effectively.

The black lining system is running in parallel with the old paper based red lining system. Business benefits are already being realised with a higher number of asset surveys being returned via the black lining system but with fewer office staff required and substantially fewer surveys being rejected.

Testing ArcGIS Online Wessex Water is testing the capabilities of ArcGIS Online for collecting location and attribute information about un-mapped sewers.

Andy Nicholson and **James Barnes** gave a demonstration including the use of graphic features in ArcGIS. The proposed methodology uses ArcGIS Online capabilities to digitise the network, and capture attributes into specified fields. Whilst an update in terms of the technology used (the user connects via the web rather than needing an ArcGIS installation), the two methods are similar enough to offer some familiarity to users.

Luke Cooper of Arup discussed their use of tablet technologies in delivering data to field-based staff at Welsh Water and the various options for returning that data (e.g. scanning paper maps, geo-referenced photos with some attribute information and the use of online portals for live data collection/delivery).

All three talks emphasised the need for infrastructure companies to collect good quality and



This new approach to data collection for SWW, required significant investment in hardware and training.



current asset data. When an existing sewer or water pipe is excavated, or a new one installed, the opportunity should be taken to collect data about these assets. This requires that operational staff use the appropriate technology. Coupled with a wealth of performance data that already exists (e.g. orders to undertake work to repair or replace assets within the network) assets can be grouped by physical attributes (e.g. age, material, size, soil structure). It is then possible to understand the performance of these assets with similar physical attributes (e.g. is failure random or do they all fail at a certain age)? It may then be possible to predict the future likelihood of failure.

With accurate and precise location information, consequences of failure can be predicted and can be assigned to the asset. Examples include knowing which assets serve the most customers – partly a function of location and topology and partly the diameter of the sewer (physical attribute). More complex consequences might be the adjacency of potentially leaky sewers to a watercourse or a large water main in a trunk road where traffic disruption from a burst main would cause many consequential problems for other agencies. Consequences are an important factor in asset management when prioritising proactive and reactive investment.

Environmental impact on water infrastructure Oliver Pritchard from Cranfield University offered insights into his doctoral research on how soils and changing environmental conditions impact upon buried water infrastructure. Previous research indicates a causal link between the susceptibility of a soil to shrink and swell under differing moisture contents with the failure of buried water assets.

The University is currently developing a new national dataset, in addition to its existing soil geohazard datasets, which incorporates the impact of climate change on future subsidence potential. Climate projections indicate a changing scenario for the UK in future decades, likely to increase potential subsidence risk in future. This is likely to have a further impact upon water infrastructure assets.

It should be a simple 'spatial join' to understand some of the risks associated to specific pipes. Soils clearly have an impact upon underground infrastructure; certain pipe materials react in different ways to different soil types. Therefore, if a definitive answer can be given to the physical attribute questions, the risk models will inspire more confidence.

Improving the prediction of failure The aim must be to improve the prediction of failure, and to understand and thereby minimise, the consequences of asset failure so that they may be minimised. This is already happening, albeit using incomplete attribute data and time lagged performance data.

There are also more practical benefits to the well-attributed asset data. When a reactive repair is required, operational staff will attend the incident with the correct knowledge and parts for the repair.

In addition to the increasing completeness and accuracy of physical asset data, the volume and speed of performance data is also growing. Networks of sensors across water company assets already provide information about the performance of a system. The way in which the industry analyses these large datasets – so called "big data" – to inform operational managers and investment decisions is fundamental to future asset management. Operational and financial managers can now view the performance of a catchment at the click of a button. Further investment is needed to achieve up to date visualisation of incidents within an operational area; the knowledge to position operational staff in the optimum locations; and creation of self-learning networks to understand normal operational conditions - and thereby to initiate changes when normal operational conditions are not met.

For AMP6, the water industry will need to adopt a technical environment that effectively supports decision-making in good time. This move is being driven by the need to deliver "totex" (total expenditure) solutions. This requires full understanding of the economic consequences of decision making but without splitting operations from capital expenditure. By reducing "totex", customers receive better value for money and lower bills.

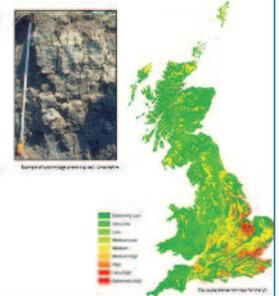
Pressures on the water industry will not just come from customers. Collaboration and sharing of data with other organisations (e.g. the Environment Agency and local authorities) will be necessary. Infrastructure schemes will need to consider all of the benefits in delivering outcomes for the customer. An important example will be centred on the management of surface water flooding - how surface water can be prevented from entering highway drains and the combined sewer network. If less water enters a sewer network, less water is treated, so helping to meet environmental compliance targets.

The water industry will undoubtedly face challenges in delivering these outcomes. But ultimately, a good quality base of evidence is needed to facilitate effective decision-making. Whilst wholesale surveys of all underground assets are near impossible, making the best use of technology to enhance that evidence base is critical during this evolution of asset management.

Clay subsidence risk mapping in the UK

Cranfield
UNIVERSITY
ITRC

- Soil parent material substrate type defines conditions at pipe/foundation depth (1.0-1.5m).
- Clayey substrates classed on relationship between soil bulk density and volumetric shrinkage.
- Non-clay substrates classed on relative shrinkability.
- Six classes of soil shrink/swell susceptibility combine with six PSMD (potential soil moisture deficit) bands to give nine vulnerability classes (Extremely Low to Extremely High) – map opposite.



Clay subsidence risk map for Great Britain.

Climate projections indicate a changing scenario. . . likely to have further impact upon water infrastructure assets.

aerial survey UAVs v. MAVs



FOR MANY YEARS UNMANNED AIRCRAFT were flown by model aircraft enthusiasts. Basic models cost less than a hundred pounds with more upmarket systems for a thousand or more. Now unmanned aircraft (UAs), unmanned aerial vehicles (UAVs), unmanned aerial systems (UASs), remotely piloted aircraft (RPAs), drones – whatever term is in favour this week, are increasingly used for professional applications for data gathering. With around 500 registered commercial UAV operators in the UK alone these aircrafts are being

taking pictures, we need to consider the accuracy of the data and that is compromised by the very small, lightweight sensors on UAVs – especially if flown in less than perfect conditions. One system is marketed at the ‘advanced’ user requiring high grade data and accuracy. The sixteen page brochure highlighted potential cost savings through speed of data capture across a range of applications including agricultural land survey, archaeological site investigation and stock pile volume estimations. The brochure describes the benefits of a modular design; a range of safety features; and an automated workflow enabling a non-specialist to process thousands of aerial images on a desktop computer to produce high grade photogrammetric data. There was not a single mention of GPS or inertial positions.

Such a system may not produce very high quality output – but what are the benefits? The ready-to-fly system cost, is from around £13,000 complete with training. This means that, with few operational

UAVs vs MAVs

James Eddy, technical director of Bluesky International and Industrial Associate at the University of Leicester explores the growing phenomena of Unmanned Aerial Vehicles in the UK and discusses the potential impact on the aerial mapping, surveying and GIS sectors.

promoted as an alternative to traditional Manned Aerial Vehicles (MAV – i.e. dedicated aerial survey planes, with pilot and sensor operators) with claims of cost savings and operational efficiencies. Are UAVs the next revolution to hit the remote sensing industry?

Arguing the case for... and against As an aerial survey company we are often asked which UAV we use for capturing and maintaining our nationwide, high resolution aerial photography dataset. The simple answer is we don't! We have invested a significant amount of money and time researching the latest developments in aerial survey equipment and practices, in purchasing state-of-the-art sensors and navigation systems, and maintaining and operating aircraft, pilots and crew.

And there is a reason for this. We maintain a national dataset updated every three years, which means capturing between 40-50,000 square kilometres of data annually. We use an UltraCam Eagle 262 Mpx camera with an image footprint of at least 20,000 pixels, an image capture rate of 3.7 gigabits per second and an integrated storage capacity of four thousand images. It captures up to 1,000 square kilometres of 8 cm resolution imagery per day. UAVs currently offered for aerial survey work capture a maximum of 5 to 10 square kilometres at the same resolution. That's less than 10 percent of the aeroplane's output.

For aerial survey work, as distinct from just

overheads, UAV operators can significantly undercut traditional MAV providers which have equipment costs in hundreds of thousands of pounds with additional, and significant, operating and maintenance costs.

Speed of deployment is much faster. A typical UAV can be carried in a car and can easily be transported and launched from just about anywhere. The UAV perfectly suited for time sensitive missions as well those applications where speed is of the essence - such as emergency service applications. UAV operators are also less restricted by the good old British weather! So UAV operators can be very quick to react – responding to a given event or request in literally a few hours depending on the proximity of the mission.

Regulation plays a role According to the Civil Aviation Authority's (CAA) website; 'unlike manned aircraft or model aircraft used for recreational purposes, there are no established guidelines for professional UAV operations and therefore operators may not be aware of the potential dangers or indeed the responsibility they have towards not endangering the public'.

In 2010 the CAA introduced new regulations requiring operators of small unmanned aircraft used for 'aerial work' purposes and craft equipped for data acquisition and/or surveillance to obtain permission from the CAA before 'commencing a flight in a congested area or in proximity to people or



... we need to consider the accuracy of the data and that is compromised by the very small, lightweight sensors on UAVs...



aerial survey UAVs v. MAVs

property'. These include an overriding / all encompassing article which states 'A person must not recklessly or negligently cause or permit an aircraft to endanger any person or property'.

Article 166 addresses the issue of visual contact with the UAV, the dropping of articles and the operation of the craft in specific airspace. An additional clause covers the operation of UAV's for the purpose of aerial work and that they may only be flown in accordance with permission granted. CAA does address the use of 'small unmanned surveillance aircraft' when equipped to undertake any form of surveillance or data acquisition. Additional operating regulations include minimum distance from people or properties. The CAA guidelines also draw operators' attention to the Data Protection Act.

In the USA, the Department of Transportation (DOT) and Federal Aviation Administration (FAA) are currently proposing new rules for small unmanned aircraft systems. The proposal offers a range of safety rules for operators conducting non-recreational operations including limiting of flights to daylight and visual line of sight operations. The FAA proposals would also address height restrictions, operator certification, optional use of a visual observer, aircraft registration and marking and operational limits.

If passed these proposals could dramatically curtail the research by Amazon, Google and DHL into 'parcelcopters' or 'delivery drones' and for aerial survey operations this would reduce the potential for large scale operations and certainly prevent their use for night time thermal surveys.

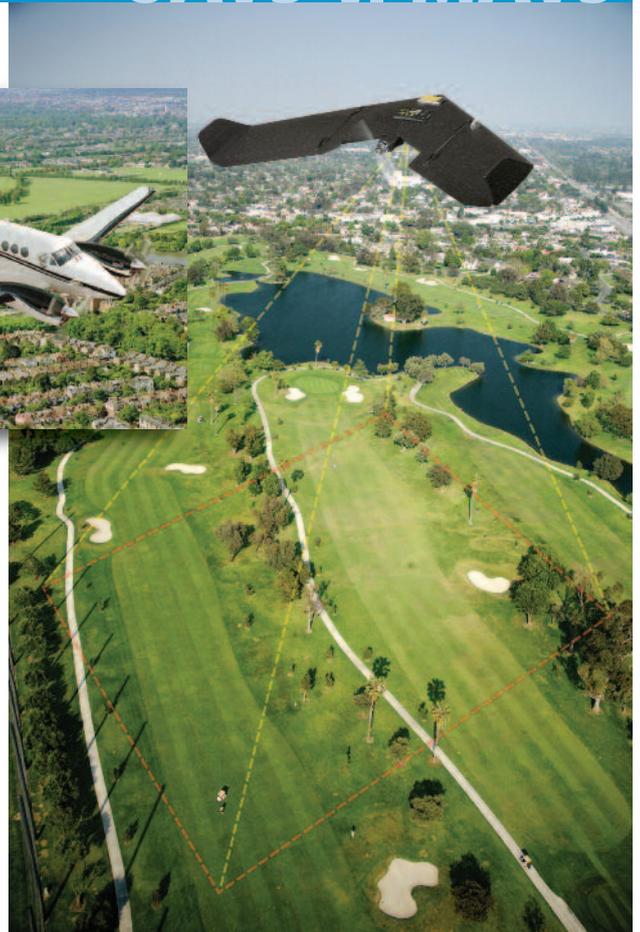
A flash in the pan or here to stay? Last year the UK's first show dedicated to the commercial UAV market attracted more than 1,500 visitors, 59 exhibitors with a programme of case studies, commercial presentations and industry seminars. In 2015 these figures are expected to double. A quick look at the show's agenda reveals a mix of subjects including platform, power and payloads, data capture and analysis, regulation, working with other technologies and emerging applications. The speakers are really diverse including the UAV suppliers, fire and rescue services, police forces, academic institutions as well as the BBC, Met Office, Thames Water, English Heritage and British Antarctic Survey.

In addition, a range of reports predict significant growth in this sector of the world aerospace industry. A report by the Teal Group, who describe themselves as 'the source for aerospace and defence industry market analysis' predicts that UAV spending will nearly double over the next decade. In the eleventh edition of this sector study the report estimates current expenditure of \$6.4 billion annually will rise to \$11.5 per annum totalling almost \$91 billion in the next ten years.

All of this would suggest that there are some serious supporters of UAVs with serious budgets!



Above: Bluesky plane mapping from the skies with great accuracy and detail.



Right: UAV mapping the ground with speed and low costs.

So in conclusion. . . in my humble opinion Are UAV's here to stay. . . YES. There has been so much investment to date and so many successful applications to simply dismiss this emerging technology as a fad.

Do they have a place in the aerial survey and mapping sector. . . DEFINITELY; where small area surveys are required and speed or timing of deployment is of greater consideration than data accuracy then UAV's will win every time. Throw in the cost consideration for commissioned surveys rather than off-the-shelf data purchase and its win win.

Will they replace MAV's. . . NO. Not until we have large, solar powered UAV's flying at 60,000 feet able to continuously download fully orthorectified aerial images over a large area. Then it might be time to retire – or make sure we have already bought in to the technology!

Is there an alternative threat to MAV's. . . I THINK SO. Perhaps a more realistic competitor is satellite imagery. When temporal frequency, control and spatial resolution match that of traditional aerial surveys then I may have to consider trading in my trusted plane and trading up!

Do I still want a UAV. . . OF COURSE. I have recently seen some stunning 2cm resolution images captured by a UAV and a half decent DSM and for once I might be allowed to take to the skies as the pilot!

About the author
James Eddy has been technical director of Bluesky International Ltd for the past 11 years. He has been involved with airborne remote sensing since 1995 and has been involved with the creation of some of the UK's largest aerial photo datasets.



The CAA guidelines also draw operators' attention to the Data Protection Act.



UAV data



SenseFly eBee Ag flying the skies.

THERE IS NO DOUBT THAT UAS TECHNOLOGY is a disruptive innovation with the potential to shake up the geospatial industry in the same way that GNSS and robotic total stations have done in the past; a theory supported by the launch of the first Commercial UAV show in London last year and the abundance of conference papers and press articles available for research. There is good reason for this. Put simply, UAS can collect large amounts of data in a short time and at a low cost. However, as the market matures, the signs are emerging that

managers across Cumbria. The system is due to be rolled out across the county and will link burial registers to a clear, accurate and up-to-date map. The end result is a hosted web based application which will facilitate complete burial ground management, protect the heritage that this information contains and maximise the potential it has to offer.

At the heart of the system lies high quality aerial photography collected at 1-2cm resolution with a hexacopter. A vector map has been extracted from this imagery, cleaned up in processing software and then integrated with other information such as headstone photography and digitised burial records to create a structured model with a clearly defined intelligent database behind it.

“Our aim is to maximise the use of the orthorectified imagery generated for this project to create an intelligent map suitably for answering many different questions. How many burials were there between 2005 and 2010? Show me where Mr Smith is

The data or the drone?

Unmanned Aerial Systems (UAS) technology includes the vehicle itself, the cameras/scanners and the controlling software. But its product is data – lots of data. **Lucy Hamilton** from Korec argues that, as the market matures, geospatial professionals should concentrate on that data.

geospatial professionals are looking beyond the hardware and instead, starting to consider the enormous potential of the collected imagery.

The technology is now in place to turn UAS imagery into processed, analysed information – a benefit that can drive greater efficiency and assist us in providing our clients with intelligent information rather than just maps to look at.

Fly, analyse, act The evolution of UAS technology has enabled us to produce aerial imagery with which to create high-resolution orthomosaics and our industry has enjoyed enormous benefit from this. For example, in construction aerial imagery can be used in many different ways, topographic survey, progress monitoring, structure inspections, volumes, cut and fill calculations, to name just a few. However most of these benefits come from observing the collected images, drawing on them, or if the data is taken a step further, used to create Digital Surface Models (DSMs), coloured 3D point clouds or detailed feature and contour maps. This information is a valuable resource but a maturing market indicates that it is those who have higher expectations of how aerial data can be used who will drive the next phase of development.

Burial ground management: **Tim Viney**, Managing Director of Atlantic Geomatics, agrees. One of his company's current projects involves a burial ground management system that has been developed in association with the Diocese of Carlisle and cemetery

buried. Show me graves by age at death. You can't do that just by looking at an aerial image. Our solution is not only to provide maps, but answers,” explains Tim.

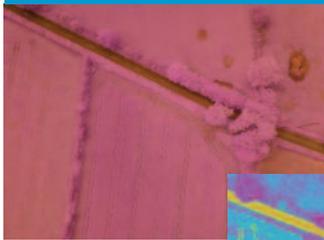
With the project taking in over 1.5 million graves, Tim is keen to streamline the data analysis process. Software now exists for the easy extraction of actionable information and Tim has been looking at Trimble's eCognition Essentials software for precisely this purpose. Where once object-based image analysis was a highly complex task with a steep learning curve, software development means that it is now possible to easily transform image data into usable intelligence thanks to the hard coding of all the standard rules of land use and identification. This software can now create polygons, identify shapes, map them and link them ready to export as a GIS layer – rules no longer have to be created, they exist already. For Tim this software, which can extract information from aerial imagery captured by any drone, means an automated process for the handling of the 1.5 million graves covered by the project.

Camera development is key The market is clearly in a transitional phase and nowhere is this more evident than in “green space” applications such as forestry and agriculture. Two years ago we were talking of market development in terms of hardware and in particular, the arrival of near infrared cameras (NIR), red edge and multi-spectral cameras. Today we see these cameras enabling users to analyse their aerial imagery and

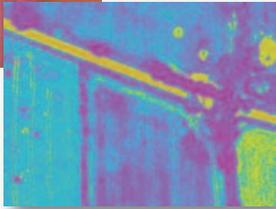
“

... UAS can collect large amounts of data in a short time and at a low cost.

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Results from Signpost Survey's eBee Ag fitted with an NIR camera. On the left is a colour composite of all three bands, NIR, green and red. The image to the right is a processed Normalized Difference Vegetation Index (NDVI).



produce not just maps, but meaningful information, something that Irish based Signpost Surveys has capitalised on for the precision farming market.

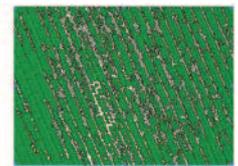
Identifying problematic crop areas: Under the guidance of company owner **James O'Neill**, Signpost Surveys became one of the first companies in Europe to invest in a SenseFly eBee Ag. This UAS offers a range of camera options including a 12 MP NIR camera which enables James to collect multispectral data across a variety of crops. By analysing the spectral reflectance values of the NIR, Red and Green bands, Signpost Surveys can identify problematic areas within a crop, for example those which are underperforming, and establish why. What sets this approach apart from traditional ground based testing methods is that the multispectral imagery reveals information that the naked eye cannot detect. Signpost Surveys can therefore identify, from analysing the industry, problematic areas, or management zones within a crop, far earlier than if just a visual assessment was made. These management zones are then used to apply fertiliser, herbicides or pesticides with far more precision than ever before allowing farmers to concentrate on affected areas and reduce inputs whilst increasing outputs.

The images above show results from the eBee Ag fitted with an NIR camera. On the left is a colour composite of all three bands, NIR, Green and Red. The image on the right is a processed Normalised Difference Vegetation Index (NDVI) which, in this case, was used as a measure of crop health and therefore an indicator of soil nutrient deficiencies. The image was divided into spectral reflectance classes with each class being assigned a different colour. From the image, areas of good and bad crop health can be identified and then soil samples taken in these areas to show that soil deficiencies equated to a poor health indication within the imagery.

360° applications – taking data back into the field We are also starting to see the first steps towards 360° applications that complete the full 'fly, analyse, act' circle. This 360° approach has been facilitated by a simple KOREC software development that allows aerial imagery to be sufficiently compressed for use on handheld GNSS devices such as the Trimble Juno or Trimble GeoExplorer Series. A touch of a button initiates a basic conversion process

which compresses and then saves the data in a variety of scales which a handheld can then automatically select from, zooming in and out as required. This full circle method is already being taken up in applications as diverse as tropical medicine research programmes for the habitat identification and fumigation of disease carrying insects, landfill site monitoring with a view to pinpointing where gas is escaping and capturing it for reuse and once again, for many agricultural projects providing an alternative way to target underperforming crops at the earliest opportunity.

Boosting potato crops: This example is particularly useful because it illustrates what can be done with RGB imagery from a standard camera. When potato plants emerge in March, fields are flown and the aerial imagery used to do a crop count. eCognition Essentials is then used to identify each plant. The fields are flown again regularly and eCognition used to check the percentages of plant and soil as they



grow. This information can be displayed in QGIS* and a grid added to show areas of low coverage. The positions where there is the least crop coverage can then be extracted and used on a Trimble GNSS to navigate to the targeted plants and provide them with the extra fertiliser required to boost their growth, maximising yield and reducing fertiliser costs.

Providing answers rather than maps The most exciting advances in technology are not always limited to a new ability to do something. The excitement comes when the technology becomes sufficiently user friendly and cost-effective to be accessible to multiple users and consequently used for unfamiliar applications.

As the UAS market increases in sophistication, so do the opportunities for geospatial professionals. The tools are now in place for us to analyse, extract and model data to provide information that is specific to a client's needs and applications. In 2015 we need to understand how and why positions are used and to be able to apply that knowledge to improve our clients' business. This approach can help us to open up new enterprise areas and new revenue streams. For those willing to go deeper into the workflows of both new and existing application areas, and for those willing to turn these exciting technologies into practical solutions and really make the data work for them, the potential is enormous.

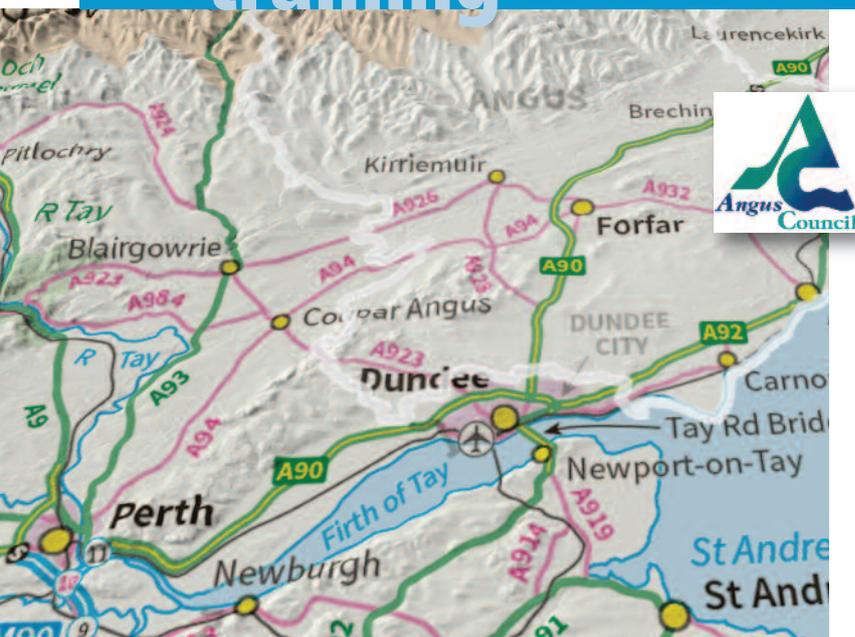
eCognition Essentials is used to check the percentages of plant and soil as the potato crop grows.



This approach can help us to open up new enterprise areas and new revenue streams.



GIS training



have had to think differently to continue to add value to council services through the use of spatial information. The GIS strategy has been reworked to include new spatial technologies in the cloud and on mobile, changing customer needs and expectations. As always, there is a demand for high quality, accurate, up-to-date, value-added information in all areas of council business.

A switch to a remotely hosted and managed web mapping solution (Location Centre by thinkWhere www.thinkwhere.com) five years ago, was the trigger to making key changes to internal data management practises. The new system presented the GIS team with an opportunity to deliver a set of training courses to council staff. Over a period of four years more than 50 training sessions were given to over 500 staff across the council. These sessions provided the opportunity for staff to access more council data and to increase the usage of that data by removing the organisational barriers between

Scottish council brings back discos!

Angus Council has radically changed its approach to the use of spatial information over the last five years with a mixture of proprietary and open source software, an extensive awareness campaign for all potential users and 'silent discos' for individualised training.

Roger Garbett and Ross McDonald explain.

THE LAST FIVE YEARS HAVE SEEN MAJOR CHANGES in how services are delivered in local government with resources being scarcer and technology developments changing traditional operational models. The corporate GIS team at Angus Council

different datasets. The number of staff now using the system has increased by 25% and there are now 300 regular users every month.

There are 40 regular ArcGIS for Desktop users and a growing number of staff using QGIS (almost 50 at last count). ArcGIS training has been delivered through "silent disco" surgery sessions where users get away from their desks for a few hours and complete a number of modules from the GIS247 training catalogue. This has enabled users to continue personal development by providing the training they want and at a pace that they determine themselves. QGIS training has been given by thinkWhere and through focused on internal sessions.

BRINGING DISCO BACK!

Angus Council went to GIS247 for their training package which "is a good all-round tool and remarkably lightweight, as everything is online. Our GIS users can use the training at their own pace and just dip into a particular section when faced with specific problems. The video and exercise solution works really well." Roger Garbett devised a novel way of ensuring staff are on-board and focused when it comes to committing to training – he calls them silent discos! "These are specific training sessions where we bring together our ArcGIS users out of their office environments for the GIS247 training", he explains.

Roger had difficulties in encouraging GIS users to train at their desks, mainly because they're so busy with other tasks. They are now invited to a training facility where they put on headphones to do the relevant sections themselves. Each one ends up doing something different, "but that flexibility is one of the real beauties of it", he adds.

So successful were these 'silent discos' that when the council lost its training facility the sessions were kept going in 'pop-up' training facilities, using meeting rooms and laptops, to ensure that everyone is up to date and up to speed with their GIS skills.



IMPROVEMENT SERVICE (IS) – aims to help Scottish councils and their partners improve the health, quality of life and opportunities of everyone in Scotland through community leadership, strong local governance and the delivery of high quality, efficient local services. IS does this by delivering a range of products and providing advisory services, including consultancy and facilitation, learning and skills, performance management and improvement and research. <http://www.improvementservice.org.uk/>

THE ONE SCOTLAND GAZETTEER (OSG) is a database of addresses of land and property in Scotland maintained by all 32 councils through their Development Control and Building Control functions, along with Street Naming and Numbering. It currently contains around 3.2 million property records and supports around 50 different applications within the Scottish public sector. These include ePlanning, both online application and appeals, providing easy to use forms for planning applications, reviews and appeals. It also supports Energy Performance Certificates. OSG provides the emergency services with access to accurate and up to date address data, with geocodes and is now also available within the Ordnance Survey AddressBase product range where it is matched to Royal Mail's Postcode Address File. <http://www.improvementservice.org.uk/one-scotland-gazetteer.html>

THE SCOTTISH SPATIAL DATA INFRASTRUCTURE encompasses many spatial datasets covering Scotland and these can be found online at <http://scotgovsdi.edina.ac.uk/geonetwork/apps/tabsearch/>. The SSDI metadata catalogue is INSPIRE compliant and run by EDINA at the University of Edinburgh.

THE INSPIRE DIRECTIVE aims to create a European Union (EU) spatial data infrastructure. This will enable the sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe. <http://inspire.ec.europa.eu/>

By providing staff with a set of functional easy-to-use tools, and helping them define workflows that deliver the information they need, we have been able to improve the sharing of datasets between teams – now digital with no more paper transfers! This has also increased the links between different datasets to help add value to the large amount of data we hold by turning it into more useful information.

Core datasets There are a number of key staff who are responsible for creating and maintaining the core council business datasets and they use a mix of Esri's ArcGIS for Desktop and open source QGIS to edit their data. We have built a hybrid GIS infrastructure

Below: Map from Angus Council detailing the maintenance responsibility for adopted roads.



which gives staff the right tools to complete their work. There are some key business processes that require ArcGIS including address and street gazetteer maintenance, route optimisation for waste collection and roads maintenance, street light asset management and core path and access maintenance.

As a result of switching other desktop users to open source we have been able to reduce contention for licences as well as reducing the overall cost of licensing. QGIS is also able to read and write directly to a PostGIS database and the corporate Oracle database has now been replaced with open source PostgreSQL/PostGIS. This has enabled us to set up very efficient workflows by editing and maintaining data directly in the database and by reducing the number of GIS files and file shares across the network. Back-up requirements have also been reduced by several terabytes – saving both time and money.

The processes pushing the internal data to the external Location Centre have been simplified and improved.

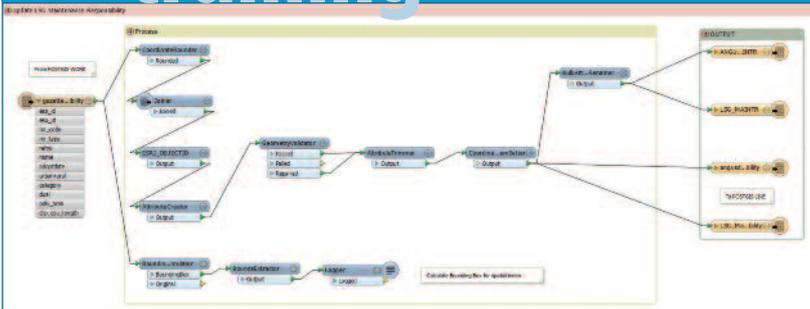
The use of open source software for key components in the GIS infrastructure has proven to be flexible, robust and very reliable. By storing our data in standard open formats it has made accessing and publishing it much easier. Key information is published on the council website and is directly accessible through address or postcode searches with results displayed both on a map and in a “what’s in my area” report. Through our



As a result of switching other desktop users to open source we have been. . . reducing the overall cost of licensing.



GIS training



Above: LSG maintenance responsibility workflow.

continued promotion of the importance of spatial functionality at internal user group meetings, GIS Day celebrations (with cake!) and training sessions, we have increased the number of available datasets from around 200 to almost 400.



“Spatial” is very much on the digital agenda at Angus Council. . .



Setting the agenda “Spatial” is very much on the digital agenda at Angus Council both through the delivery of services and the creation of an open data portal. We are actively involved with a Scotland wide spatial data audit led by the Improvement Service which aims to deliver cost savings and efficiencies through the conflation of local government datasets into national coverages. While still in the trial stage this project, combined with the One Scotland Gazetteer service, hopes to simplify meeting the EU INSPIRE requirements and contribute to Scottish Spatial Data Infrastructure, while delivering the

immediate benefits of joined-up data. (see box above)

Angus Council is looking for more opportunities to share resources and services, adopt cloud platforms and use web services to share and link information. The foundation of spatial information that we are laying down becomes ever more important in helping us realise these goals.

About the authors



Roger Garbett is a GI Engineer for Angus Council and has been since January 2011. Before that, he worked in Senior Software Support for Telford & Wrekin Council. He also holds a BSC (Hons) Business Information Systems degree from the University of Wolverhampton.



Ross McDonald is currently working as a Corporate GIS Data Coordinator at Angus Council. He mainly manages the corporate side of GIS but also runs online GIS training sessions and explores open-source GIS alternatives among many other things.

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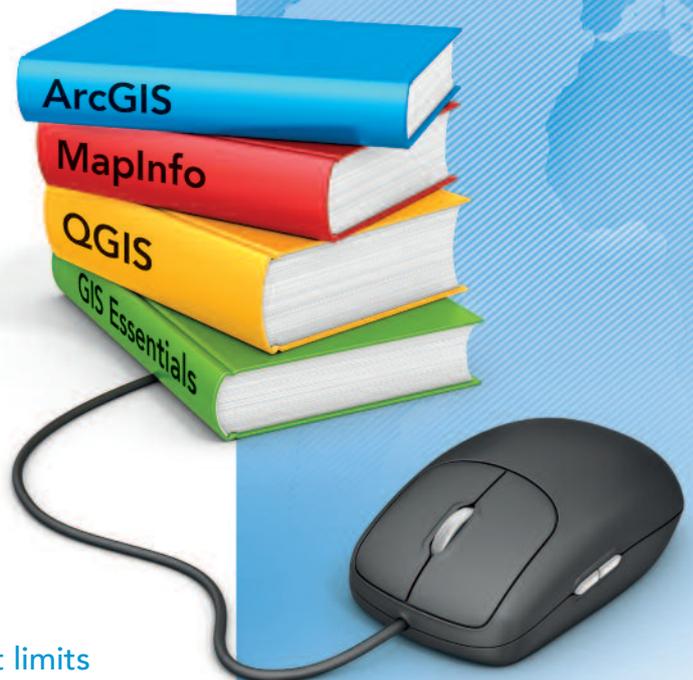
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About the author

Ian Coady has worked for the Office for National Statistics in the role of Geography Policy and Research Manager for the last six years and has a particular interest in international policy such as INSPIRE and UN-GGIM.

THE OFFICE FOR NATIONAL STATISTICS is, by nature, an 'open' organisation. Statistics are designed to inform debate and support policy makers and, thankfully, nobody in their right mind would consider limiting access to published government statistics. ONS has therefore published 'open' data before the Guardian's Free Our Data Campaign, before Sir **Tim Berners-Lee** was making the case for 'open', and long before prime ministers committed themselves to the open data agenda. ONS was doing open data before open data was cool.

Everything happens somewhere We know statistics and location are linked because everything happens somewhere. So ONS has also sought to make its geographic data 'open' because this is needed to analyse and interpret the statistics. Before open data became cool, ONS fought several battles just to try and make data freely available. A number of our statistical geography products were 'derived' from other organisations' data on which intellectual property rights (IPR) are claimed and this often meant that we unwillingly had to impose licensing and cost restrictions on our data products.

'open' address gazetteer. The Open Address project has set out to capture the same addresses that are already captured in PAF and the National Address Gazetteer from which AddressBase products are derived. But it cannot use either for fear of being contaminated with Royal Mail and/or Ordnance Survey IPR. This is being funded by the same government that sold off PAF and that is also paying Ordnance Survey to make some of its geographic data open! And because the UK government hadn't been clear enough around its own geographic open data policy there are clearly some organisations that have seized on this as an opportunity to defend their own data monopolies.

Devolve the problem? Stormont didn't receive any funding from the government's agreement on open data so Northern Ireland has fairly taken the issue of open data as a devolved matter and hasn't released any geographic data in an open format. We also have separate mapping agreements for England and Wales; Scotland; and Northern Ireland, even though many customers have a UK-wide remit.

An insider's view on....open

Census data and other national statistics are 'open'. But they relate to various geographies that are not. **Ian Coady** from the Office for National Statistics explains how this has happened because we lack a coherent government strategy for 'open' data.

Then, on the 17th November 2009, the prime minister intervened. **Gordon Brown** announced to everyone's surprise (including apparently Ordnance Survey's) that a large amount of Ordnance Survey data was going to be open and set them a deadline within which it should happen. This was the birth of the glorious open data agenda. It was to be a golden age in which all data would become open and interoperable, and would support SMEs to grow and large organisations to become more efficient. Except it hasn't really worked out like that.

Haphazard policies What followed over the next five years was a haphazard approach to open data that often involved organisations taking a silo approach to publishing data and trying to make their product the 'definitive' one.

Take just one glorious example – addressing. Royal Mail was sold off to the private sector in 2013 along with the Postcode Address File (PAF). The open data announcement was also the catalyst for OS and the Local Government Association to buy out Intelligent Addressing and set up GeoPlace with a remit to integrate OS and IA products into a definitive national address gazetteer. But the resulting AddressBase products are not only proprietary to Ordnance Survey; they also include Royal Mail IPR because they use PAF as a primary source.

Now we have the Open Data Institute's (ODI's) Open Address project which has the aim of creating an

The geographic community have always known that there is more value in a single, complete and authoritative dataset than multiple, partially open, partially duplicating ones. We don't need more products or more open data initiatives. What we need is a clear government strategy for consolidating the existing datasets and making them open. Some revenue may be lost, but the efficiency saving across government will more than compensate for that loss at the national level, if not at the organisational one. Surely the ability to provide a single authoritative dataset to inform debate and support policy making has greater value to the economy than each organisation trying to stake its claim in an ever more crowded geospatial marketplace?

Choices, choices Where does all of this leave ONS and its geographic products? Where IPR still exists in the data from which we intend to derive our products we have a choice. We can adopt a pragmatic approach and pay the licensing fees so that the public have access to the data but often with ONS absorbing the cost by paying other government departments – and still without being able to give the user carte blanche for their own products. Or we simply strip the derived data from our products and release what's left as open data. Whichever approach we take, it's hard to see who benefits!



We don't need more products or more open data initiatives. What we need is a clear government strategy. . .





Christine Easterfield is a principal consultant with analyst and research firm, Cambashi. She has over 20 years' experience in the software business, with roles in programming, training, consultancy and product marketing management.

MANY SMART CITY INITIATIVES are underway in the UK and worldwide; and GIS practitioners in the city planning community are well aware of the groundwork being laid to accommodate an ever-growing population. Geospatial tools are commonplace now; they are used to plan and police city zones and planning restrictions. Where that planning activity meets the built environment is where we see our geospatial tools interfacing with Building Information Models (BIM).

These models provide a repository for data through all the stages of site development and facilitate cooperation between designers, engineers and construction teams, resulting in a typical 3D model of all the structural data needed to build and run a modern building efficiently.

During the design and construction phase, building information models can provide the basis for simulation exercises that ensure that last-minute alterations to plans cause minimum disruption to the schedules. Sharing this data as construction progresses provides early detection of (potential) snags and helps

assets can be avoided by the next team to dig up the road. Utility providers in many territories are under regulatory obligation to provide data on the location of their wires and pipes. Building information models provide access to information at a similar level of detail at the scale of the building itself. Initially this supports collaboration between different construction teams but as the building moves into operation it becomes a tool to hand off information about the building to maintenance teams and other contractors with responsibility for the running of the site.

Optimising with city models The advantages of such a level of integration with the built environment are many and city models are being developed that could be used to optimise the operation of a whole community. Building on agreed protocols that enable software tools from widely differing backgrounds to interact, as with the CityGML specification maintained by the Open Geospatial Consortium (OGC), we are beginning to see how these city models can be used.

Geospatial and buildings: can we bring it all together?

The GIS interface with BIM involves many planning, utility and construction professionals. **Christine Easterfield** from Cambashi, Cambridge based independent industry analysts, looks at this interface from a business perspective and concludes that GIS providers are dwarfed by CAD companies, which may affect how those professionals can work together.

reduce rework. Running costs can be calculated based on the planned work, ensuring exact combinations of heating, ventilation and air-conditioning systems are optimal for the building's planned use. The goal is to prove as much as possible of the design to reduce the need for corrective work on site.

BIM and GIS are crucial When developed alongside the geospatial data that sets the real world context for the building or site, data that can support analysis of the services provided, combined BIM and GIS datasets become crucial to the successful running of the site. Any project involving the built environment benefits from the visualisation and operational simulation which is offered by BIM tools, whether for an office block or a motorway bridge. As the development goes operational, the BIM lives on to provide a starting point for managing the site and a repository for on-going maintenance data.

This collaboration and integration between design and construction phases is a relatively recent development for those disciplines. But the GIS practitioner is long used to integrating with other agencies. Highways authorities are continually exchanging data with water companies, energy suppliers and telecom operators so that their buried

In Salzburg, for example, their city model draws together workflows for geospatial features, planned building construction, and utility assets into a single base for urban planning. Many cities worldwide have similar models that support planning, environmental monitoring, traffic flows and more. Integrating these with BIM data that adds structural information, energy usage and access capabilities extends the range of useful analysis open to both the urban planner and the city maintenance department.

One example of combining BIM (specifically construction-phase BIM) data with on-going geospatial data shows how construction activities can be plotted into the traffic plan for the day. So now a city can show planned changes to road closures, for example because of the arrival of an oversized crane onsite, and not just report on road blockages or increased density in traffic that has already happened. While it is useful to know why you are stuck in traffic, much better to know where delays may occur and avoid the area.

Does size matter? Interoperability between GIS and BIM is still largely an exercise for the reader and the advantage must surely be with providers that offer both sides of the equation. As well as the likes of Autodesk



Autodesk and Dassault Systèmes alone have revenues in excess of the entire market for GIS software. . .



and Bentley who are established as geospatial as well as architectural and construction software providers, there is a growing range of BIM options from the established CAD houses – Nemetschek has long championed BIM, being an early adopter of support for industry foundation classes (IFC), even Dassault Systèmes - best known for manufacturing design - has a BIM capability. It is worth bearing in mind the relative size of these players compared to the GIS providers. Autodesk and Dassault Systèmes alone have revenues in excess of the entire market for GIS software suggesting there are a number of powerful players out there that could out-invest most GIS providers.

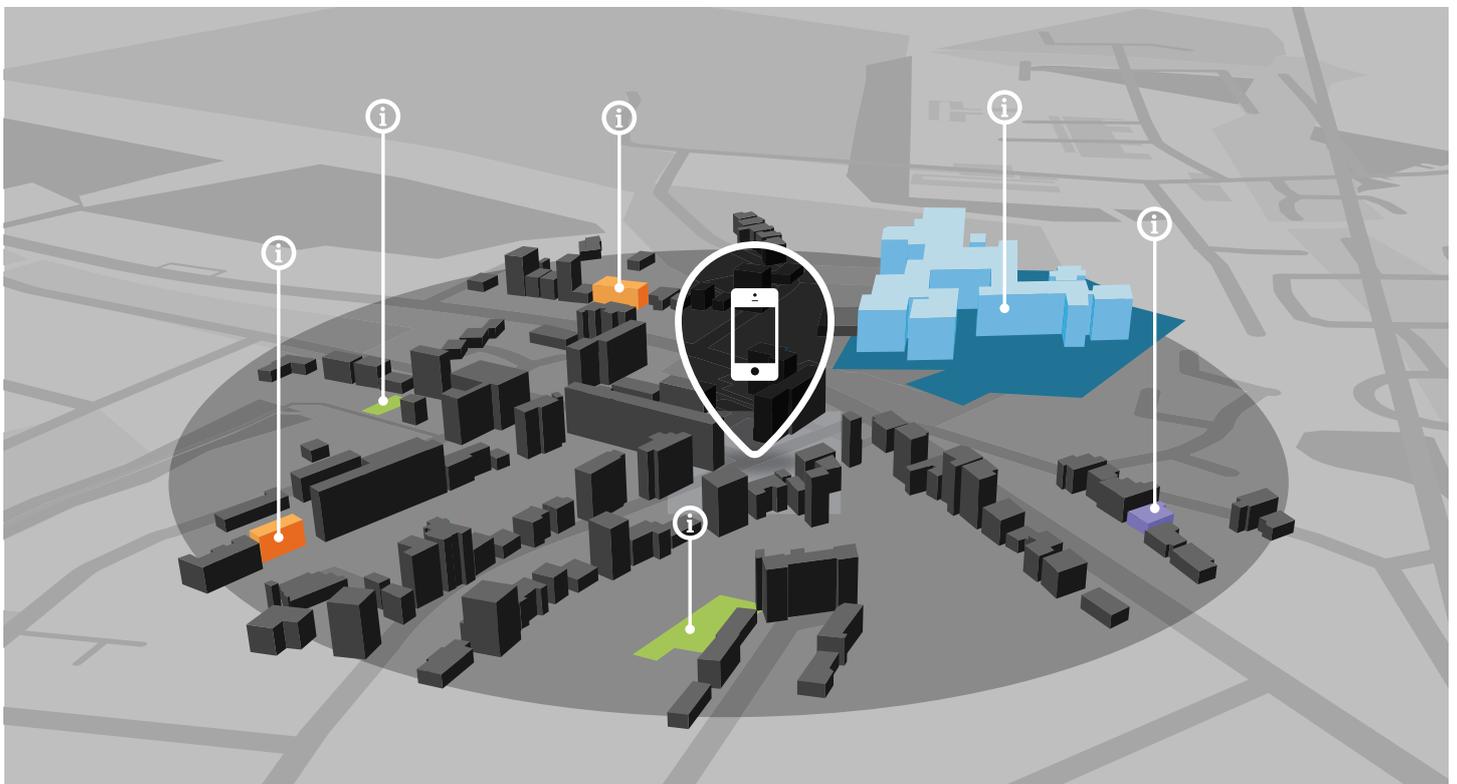
In practice the geospatial side and the design and construction sides are still operating in isolation. One reason for this may be the lack of a long-term economic driver for creating and maintaining building information models or city information models. Government initiatives and regulations are important in this area, driven in turn by the need to be more efficient in the use of resources by reducing waste and conserving energy. The UK government, for example, requires all publicly funded infrastructure projects to use building information models – that is to say producing an electronic version of all project and asset information - by 2016, which is getting uncomfortably close. The goal

is to introduce savings and will provide a source of data for integration with equivalent (geospatial) data from highways, transportation and energy projects.

Government can benefit but what about the private sector? The benefits are most closely seen in the running of the building and in these projects where the government body is the building owner or operator. The same benefits could be available to the private building owner/operator but for the private operator, it is not so simple to prescribe the use of BIM. The architects and developers may have little or no relationship with the eventual building owner or operator, so incurring the cost of capturing full BIM data may be harder to justify. Until it becomes accepted good practice, the appearance of BIMs will be patchy. But with governments providing the example of savings that can be achieved, delivering a completed BIM may well become an asset of the development as delivered. When that happens, the geospatial operators need to be ready to accept that data into their view of the world. And by getting ready for BIM, they'll be more prepared for the onslaught of smart building data streams: energy generation and consumption; communications; footfall; occupancy and travel patterns. All plenty of sources for which geospatial integration can add-value.



... the GIS practitioner is long used to integrating with other agencies.



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AGI column



David Henderson is a geospatial professional with a geographer's heart. He is the Head of Product Management & Development at Ordnance Survey and is serving as AGI's Chair in 2015.



THE ASSOCIATION
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INFORMATION

AS A STRONG ADVOCATE of the culinary merits of the sweet potato, your Chair was particularly pleased to see the recent addition of this humble root vegetable to the basket of goods and services that underpin the Office of National Statistics (ONS) calculation of the consumer price index. However, more striking for readers of this magazine is no doubt the widely reported removal of the standalone satnav device only eight years after their addition - users now tending to use their smartphones or rely upon those services increasingly built into new vehicles. Perhaps of more significant interest were the additions of subscription services for both music streaming and online gaming, a clear sign of the trend towards online serving of content to which most publishers and consumers of geographic data will immediately relate.

Of course, the ONS basket is one of many indicators of change. During the last month I have participated in several events across both the public and private sectors where the significance of open data ecosystems have been explored as a platform for innovation. It has been particularly encouraging to discover an increasingly new audience of developers building geographically aware applications and services. In these times of rapid change it is essential that the traditional geographic information industry (sic) continues to innovate fast and take opportunities in

communication and networking skills; training in the CGeog application process; and importantly, an opportunity to access mentoring from industry leaders.

We are working closely with our colleagues in The Royal Geographical Society and The Royal Scottish Geographical Society in order to align our collective activities and events and to ensure that our combined efforts help younger professionals build their careers and their case for chartered geographer accreditation. If you have less than ten years work experience and are interested in becoming part of this network, please send an email stating your interest to ecn@agi.org.uk and we will add you to our mailing list of future events and activities. We are also looking for more experienced GIS professionals (10 years+) to support the Early Career Network by sharing their skills and experience with network members and by providing presentations, mentoring and advice at our events. If that sounds like something you would be keen to support then please get in touch!

Looking towards 2020, the AGI will publish a foresight report later this year. Articles and insightful content are being developed at present and our editorial team would welcome discussion with any parties who would like to be involved. There will be more on this as the year progresses, but in the meantime please speak to

Sweet spot in ONS and help for early careers

A new initiative will see help for younger AGI members during the early years of their career, reports AGI Chair **David Henderson**. But first he expresses his delight in a humble vegetable's debut in that basket of national goods.

AGI exists to "maximise the use of geographic information (GI) for the benefit of the citizen, good governance and commerce". Membership details are available from info@agi.org.uk or by calling: +44 (0)207 591 3190

response to both market and technological trends. For those who haven't yet taken part, The AGI's Geo: Big 5 event series is a great place to start. Following a very successful review of the trend towards smart energy at our first event in Edinburgh, the next events get under the skin of BIM (Cambridge, April) and the latest developments in geographically aware sensors and sensing (Belfast, May). Both promise to be highly relevant to developments in our market and will provide a fantastic opportunity to network with new colleagues. More information can be found on the AGI website.

Starting early AGI provides a collective voice for the geospatial industry and supports members throughout their careers and as their businesses grow. However, this year we particularly want to do more to help our younger members, early in their careers. With this in mind, I'm delighted to promote the launch of AGI's Early Career Network. By establishing a brand new volunteer support network and a programme of events targeted at the needs of Early Career Professionals we hope to provide greater encouragement to develop careers in the geographic information industry. Members can expect opportunities to raise their profile within the industry through AGI events; targeted training and workshops in

the AGI team to find out more if you are interested.

And finally... Since the closing session at last year's AGI annual conference in Warwick I've often found myself pondering the impact that better story telling would have for our industry. We're great at producing case studies and have become expert in conveying a sense of the very real return on investment that geographic information and geographic information systems and services unquestionably deliver. However, I do wonder whether it's enough to rely on factual presentation of past experiences and the resultant customer value. Stories can inspire a sense of what might be rather than simply what has been. It is this sense of discovery that underpins what innovation means to me and I wonder whether the future value of our industry is dependent on our ability to instil a greater degree of imagination in how we pursue the opportunities that current changes afford to us.

Thank you to those members who have been in touch since the start of the year and the encouragement that you continue to provide to members of the AGI Team and your council. Thank you also to those members who continue to volunteer and participate in events and other AGI activities. It's been great to meet so many of you and I look forward to meeting more of you soon.



... removal of the standalone satnav device only eight years after their addition. . .





service which will free up business and intelligence personnel to focus on more complex analytical tasks using desktop licences."

Mike O'Neil, CEO Cadcorp commented: "Fire and rescue services are under incredible pressure to do more with less, and to do so without compromising the safety of either the public or fire and rescue service personnel. We believe that by sharing geographic information through an easy-to-use and web-based self-service model, CFRS will be able to achieve this goal."

About Cambridgeshire and Peterborough Fire Authority Cambridgeshire and Peterborough Fire Authority is the governing body responsible for delivering a fire and rescue service to the 820,000 people of Cambridgeshire and Peterborough. It was established in 1998 when Peterborough City became a unitary authority. The service operates from 27 fire stations which vary in status from being staffed 24/7,

Cambridgeshire and Peterborough Fire & Rescue opts for Cadcorp corporate GIS

CAMBRIDGESHIRE AND PETERBOROUGH Fire Authority has contracted with Computer Aided Development Corporation Ltd (Cadcorp) for the supply of a corporate geographic information system, bringing the number of UK fire and rescue services using Cadcorp GIS software to forty one.

The British software development company won the multi-year contract in open competition. Cadcorp will supply and implement a GIS solution comprising a number of licences of Map Modeller desktop software, and Web Map Layers, Cadcorp's web mapping application. Training and consultancy services are also included, and support and maintenance will be provided for the lifetime of the contract.

Nicola Smith, Business and intelligence performance manager at Cambridgeshire Fire & Rescue Service (CFRS) explained the business drivers behind the procurement: "CFRS has three responsibilities as a fire and rescue service: protection, prevention, and response. Accurate and timely analysis of geographic information assists us in identifying trends and understanding risk in the communities we serve. The new system will greatly expand the reach of geographic information in the service, taking it outside of the Business Intelligence and Performance group. We are establishing a web-mapping service which will enable anyone to access maps along with a range of geographic information via our intranet. The end result will be that users will experience a more efficient and more effective

365 days a year, to being completely on-call. The county has a number of major trunk roads running through it, including the A1 and A14, and a large network of rural roads, so as well as responding to around 2,000 fires a year, the Service also attends around 500 road traffic collisions.

About Cadcorp Cadcorp is a British software development company focused on geographic information system (GIS) and web mapping software. It offers a complete suite of products - the Cadcorp Spatial Information System® (Cadcorp SIS®) - addressing all phases of spatial information management. Cadcorp SIS is available worldwide through a network of Cadcorp partners and through a direct sales team in the UK and Ireland. To find out more, please visit www.cadcorp.com



“
Accurate and timely analysis of geographic information assists us in identifying trends and understanding risk. . .
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GNSS enabled GIS data collector



SCCS is currently offering the Topcon GRS-1 handheld GIS data collector for £2495. The device comes with a 72-channel dual frequency L1/L2 GPS receiver, an integrated cellular modem, internal 2 megapixel autofocus digital camera, Bluetooth, 256Mb of SDRAM, an 806MHz processor and Windows Mobile OS v. 6.1. An external L1/L2 antenna is also available for GIS-RTK (<5cm) work. The GRS-1 is designed for any GIS application including high accuracy projects such as utility infrastructure, underground electric and gas, water/wastewater, asset management, and land records management. More at <http://www.sccsurvey.co.uk>

Offline maps for mobile multi platform

Mobile geospatial technology company Nutiteq from Estonia has launched an offline maps service with a new mobile multi-platform SDK (software development kit) for GIS and geospatial application developers. Nutiteq Maps 3.0 has a unique feature set, including customization flexibility, uses open standards and enables building professional GIS and GEO applications for Android, iPhone, iPad, Windows Phone, wearables and other device platforms.

A global offline maps service is provided as a cloud service, powered by worldwide OpenStreetMap map data. For professional users, Nutiteq offers freedom from particular map data, GIS or cloud service providers. "We enable quick

and cost-effective transition of GIS solutions to mobile platforms – now there is a global offline maps service in combination with our proven cross-platform maps SDK for Android and iOS platforms", explains **Jaak Laineste**, founder and technical manager of Nutiteq (www.nutiteq.com).

Web mapping helps NMC

A partnership with the National Map Centre (NMC) sees FIND's web mapping technology powering NMC's refreshed mapping and data system. The NMC's website - www.mapsnmc.co.uk – has been refreshed and features an online mapping system where customers can register and download OS map data and create plot prints for planning purposes, as well as annotate maps with easy-to-use tools. **Julie Cleary**, manager of

NMC, commented: "FIND's system has significantly streamlined the process of ordering data for our clients. We are able to offer a whole new range of products like aerial imagery."

Handheld upgrades

Handheld has announced a major upgrade to its Algiz 10X rugged computer (IP65 rated) featuring the Windows 8.1 Pro operating system (which is downgradeable to Windows 7 for maximum flexibility). Windows 8.1 Pro offers enhanced features to help users easily connect to company networks, access one PC from another, encrypt data, better wireless communication support including LTE, which provides substantially faster data speeds, both up- and downstream, and increased overall network coverage.

Marketers tool for 2015

A new version of GfK's geomarketing software RegioGraph for 2015 offers many new features, including a web viewer, IP geocoder and simplified data import. RegioGraph is a software for location intelligence applications ranging from market and target group analyses to sales territory optimization and expansion planning, which allows users to visualize their customers, target groups and potential on digital maps and carry out analyses using detailed integrated data on potential.

Smallest tracker in the world

French company Aguila Technologies is launching what it claims to be the smallest GPS mini-tracker in the world. The Aguila1000 weighs only 35g and offers long energy retention that can remain on

standby for up to a year; a highly sensitive mini-GPS accurate to 3m; movement and impact sensors; Bluetooth 4 (low-consumption) communications; GPRS data transmission and various power-management scenarios offering long-lasting and complete energy autonomy.

The mini tracker is aimed at reducing the current surge in thefts of shipments, jewellery, works of art, equipment, machinery and various commodities, together with the increased requirement for tracking in the logistics and supply chain such as those requiring powerful and discreet tracking. It can be configured remotely using a smartphone, tablet or PC.

GNSS receiver pairs with mobiles

Trimble's latest GNSS receiver, the R1 is a pocket-sized, rugged, standalone unit that works with iOS, Android or Windows mobile handhelds, smart phones and tablets using Bluetooth. When paired with a smart device, the receiver adds professional-grade GNSS geolocation capabilities to transform consumer devices into high-accuracy mobile data collection systems.

The Trimble R1 receiver is compact and portable weighing only 6.5 ounces (187 grams) with an all-day battery life. The receiver integrates with Trimble's TerraFlex, Trimble TerraSync and other mapping and GIS field software.

Thermographic surveys by UAV

Thermographic Consultancy, a distributor of FLIR Systems' thermal imaging equipment, is offering a service to fly thermal imaging mounted on its custom-built 1015mm diameter

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octocopter so that clients can get accurate surveys of complex or hazardous areas, such as industrial sites and rigs, safely and quickly.

Applanix GNSS/INS for UAVs

Applanix has announced the APX-15 UAV GNSS-Inertial system for small unmanned aerial vehicles which can reduce - or even eliminate - ground control points. Sidelap is significantly reduced and the package, which weighs just 60g, includes POSpac UAV post-mission software.

Geo Calculator 2015

Blue Marble Geographics has announced the release of the Geographic Calculator 2015. This major release features several new administrative

tools, support for geoid creation in conjunction with Global Mapper v16, and support for magnetic declination.

Esri tighten integration with LandWorks

Tighter integration with Esri GIS solutions and software "rebuilt from the ground up" are introduced with LandWorks Release 5.20 for its three primary software suites: Property Management, GIS and WebMaps Enterprise GIS. Deployed extensively for land asset management and mapping in the oil & gas, utility, mining, pipeline, renewable energy and government sectors, LandWorks appeals to a wide audience. Details on Release 5.20 may be found at <http://www.landworks.com/products/>.

KCS TraceME expands Internet of Things



KCS BV, based in Dordrecht (NL) has extended their successful TraceME product line with an advanced module, targeted for worldwide mobility in the "Internet of Things" era. The latest development in the TraceME GPS/GPRS Track and Trace module combines RF location-based positioning with the LoRa™ technology. This combination of technologies means that 'smart objects' can become even smarter, as LoRa enables long range, battery-friendly communication in a wide variety of (M2M) applications.

Supporting GPRS/SMS and optional 3G, Wi-Fi, Bluetooth LE, ANT/ANT+ and iBeacon provides easy integration with existing wireless networks and mobile apps. The module will be available in Q2/2015 and other variants in the high/mid-range and budget-line will follow shortly after. For more go to, www.trace.me.

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Join us for **HxGN LIVE**, Hexagon's annual international event dedicated to helping customers harness the power of Hexagon technologies. For the first time, **HxGN LIVE** will be brought to you from two locations – **Las Vegas** will host the conference **1-4 June**, then **HxGN LIVE Hong Kong** will take place **18-20 November**.

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We welcome advance details of conferences, seminars, exhibitions and other events which are likely to be of interest to the GIS community. Please mention the name of the event, venue, date and point of contact for further information and send to Jason Poole *GISPro*, 2B North Road, Stevenage, Herts SG1 4AT or e-mail: jason@pvpubs.demon.co.uk.

APRIL 2015

World Cadastre Summit
20-25th April 2015, Istanbul, Turkey
<http://wcadastre.org>

Geo:Big 5 - BIM: The Next Level
23rd April 2015, Murray Edwards College, Cambridge, UK
www.agi.org.uk/events/calendar

MAY 2015

GeoPlace: Everything Happens Somewhere 2015
19th May 2015, Birmingham, UK
www.geoplace.co.uk

Esri UK Annual Conference
19th May 2015, London, UK
<http://www.esriuk.com/events/annual-conference-2015/registration>

MAY 2015

RIEGL LIDAR 2015
5-8th May 2015, Hong Kong and Guangzhou, China
www.riegl.com/media-events/events

FIG Working Week
17-21st May 2015, Sophia, Bulgaria
www.fig.net/fig2015

GEO Business 2015
27-28th May 2015, Business Design Centre, London, UK
<http://geobusinessshow.com/>

JUNE 2015

HxGN Live 2015
1-4th June 2015, Las Vegas, Nevada, USA
<http://hxgnlive.com>



2015 Geo: The Big 5 event programme

Following incredible success in 2014, the Geo: The Big 5 event programme is back, focussing on five developing sectors that will be central to the GI industry over the next few years.

BIM: The Next Level - 23 April - Cambridge

We move beyond the discussions in our 2014 event on Building Information Modelling (BIM) & Asset Management. With the implementation for BIM Level 2 (2016) well progressed, the focus has shifted to preparing for Level 3 (2018) and beyond. We look at the real benefits in social performance where even modest improvements translate into mind blowing financial savings.

Sensors and Mobile - 14 May - Belfast

There has been consistent progress in remote platforms for capturing ever higher yields of data. The current explosion of UAB providers within our sector illustrates the appetite. Advances in high altitude sensors, the supply of data and point clouds provide vast opportunities. There is a continuing challenge - how to extract meaningful information. We will focus on the use and applications of mobile/remote platforms and the solutions being applied to the ever growing volumes of data.

Future Cities: Security - 9 July - London

Future cities used to be sustainable and resilient to change. But triggers for change are increasing: energy and food prices, severe weather events, and aging infrastructure. Cities face a myriad of potential future shocks and stresses. To meet these challenges they must work to identify risks and mitigate against them with location as a key component.

Big Data & You - 8 October - Cardiff

This event will look at the applications of Big Data and the ethics of Big Data and privacy. A major theme raised at last year's Big Data event, was the identification of geospatial information as a 'key' to the deanonymization of personal data. With the benefits offered by Big Data come potential issues around securing personal rights and the role of geolocation in this arena.

GeoCom: Resilient Futures and AGI Awards for Geospatial Excellence - 23-25 November - Warwick

This annual flagship event will provide a climax for the 2015 event programme, bringing together the year's themes. Chesford Grange Hotel in Warwickshire will again be the residential format to maximise the opportunities for debate, engagement and collaboration.

Our annual awards celebrate best practice from across the UK in the application of Geographic Information, providing an opportunity to meet with innovators from across the UK in a variety of sectors.

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