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issue 70 : June 2016

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Lighting up the enterprise at QEI

Lord Chorley remembered

Change at AGI: we talk to Council members

Springtime for OS's Geovation Hub

Mapping Shakespeare's plays

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The disruptive Internet of Things

Richard Groom reports from a seminar on this hot-button topic predicted to be disruptive rather than evolutionary.



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Painted map celebrates the Bard

Cartographic artist **Jane Tomlinson** from Shakespeare's home town has created a brilliant map depicting his plays, characters and quotes.



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Something for everyone in Islington

Quite a buzz at the Business Design Centre for GEO Business, was the verdict on the industry's top event, with more visitors and more exhibitors.



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'I will be your champion' says minister

The GeoPlace conference and Awards Day for council gazetteer custodians attracted a government minister who knows all about addressing.



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Lighting up the enterprise

A very busy day at Esri's annual user conference attracted over 3000 registrations. With so much choice it left your reporter tired but satiated!



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Lord Chorley remembered

A man with a 'large hinterland' whose report triggered the GIS sector in the UK is recalled by friends and members of his committee.



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All change at AGI - Council talks to GiPro

Recent changes in staffing and direction at the Association see it set on a new course. So what's behind it? We talk to Council members.



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Springtime for Geovation

Ordnance Survey's Geovation Hub was the venue to debut a number of GI entrepreneurial projects from late night safety to transport networks.

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Next Issue: August 2016

Copy dates **Editorial:** 11 July

Advertising: 22 July

FRONT COVER: This year's Esri User conference attracted a record number of delegates and many fascinating sessions. This pic shows the end-of-day reception with barely enough room for a glass between them! **Turn to page 18 for the report.**



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or turn to page 09

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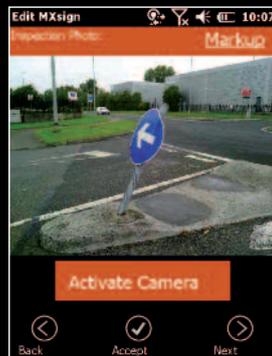
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welcome. . .
to the June 2016 issue of *GIS Professional*. . .

Much ado about quite a lot actually

I MUST APOLOGISE TO READERS for the lateness of this issue. April and May were busy months with several stand-out GI events to cover and a week's holiday in Lyon and Nice could not be missed. In addition, as you can read on page 6 (News), there were changes afoot that had to be carefully considered for this magazine and its publishers.

In addition to reporting events I have been talking to key members of the AGI's Council following the departure of two fulltime staff and far-reaching changes to the management and administration of the organisation. Council members stress very strongly that AGI is in good financial shape and the changes come about following a very careful appraisal of where the organisation is going, against a backdrop of a rapidly changing geospatial sector. There have nevertheless been tough decisions, but ones which will help develop a very different AGI, one more tightly focused on members' needs. You can read the full Q&A session I had with them from page 24 onwards.

Back in 1987 I remember reading all about a report into the benefits of geographical information. What was it all about? Of course I knew all about maps and their benefits. I come from a construction background and particularly the laying of high pressure cross-country pipelines over considerable distances. OS maps were an essential tool to locate features on the terrain like, rivers, roads and other obstacles to be traversed. Maps from British Geological Survey too were an essential to gain understanding of whether we would be excavating in clay or hard rock. But it hadn't really clicked how in the computer age this information could all be linked and interrogated within one system. A technical trip at the same time as the *Chorley Report* to my local water company demonstrated what was already possible from an early system that was struggling with raster maps; it was another seven years before OS completed their map digitisation programme.

Lord Chorley died earlier this year and we pay tribute to him and his eponymous report through the recollections of those who knew him and worked with him on the committee that produced the ground-breaking report that gave rise to the AGI and a multi-billion pound industry.

Two things have imposed more influence on the English language than anything else. Phrases from the King James Bible and Shakespeare permeate our daily speech, with few realising it. In this celebratory year of Britain's great bard, **Jane Tomlinson** has produced a beautiful painted map that brings to life his many plays and famous quotations from them. You can see the map on page 13 but better still why not buy a copy for closer study?

In his closing address to the Esri User conference Royal Geographical Society President **Nick Crane** talked of "a great age of geography" that began five hundred years ago with the European voyages of discovery (mainly looking for spices and treasure) and the arrival of cartographers and surveyors like Mercator and Frisius. Meanwhile in a separate talk Esri UK chief technology officer **Charles Kennelly** believes that we're living through a "Golden age of GIS", a statement which I think many readers of this magazine would concur with. You can read a report of the conference from page 18 onwards.

Well, there's lots to read in this issue. I hope there's something to whet every appetite. Our next issue is August, copy date for editorial submissions is 11 July. Is there an interesting project or aspect of your work you'd like to share with readers?

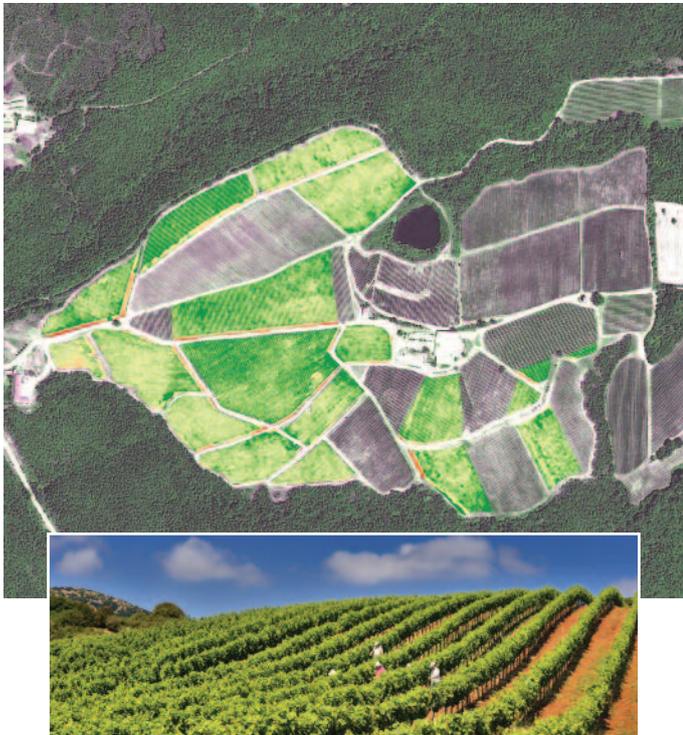
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... the committee that produced the ground-breaking report that gave rise to the AGI and a multi-billion pound industry.



Satellite imagery helps improve the wine quality



Canopy greenness map over Naoussa in 2015 derived from WorldView-2 data for the grape variety: Ksinomavro. © Remote Sensing Laboratory © European Space Imaging. Inset shows researchers in the vineyards collecting data with hand-held spectrometers. © Remote Sensing Laboratory.

Normally grapes need to be tested throughout the growing season by people walking through the fields using hand-held spectrometers. The data collected is used to determine when nutrients, pesticides and additional water should be applied to optimize grape growth. But gathering this way is a slow process, expensive and it is hard to analyse the whole field at once.

In a recent case study multispectral VHR imagery has been used by the Remote Sensing Laboratory at the National Technical University of Athens, Greece. They tested the data information quality in four vineyards in northern Greece comparing data gathered on the ground with the information collected via the satellite sensor at the same time on the same day with the aim of understanding if there is a benefit using Earth observation data.

The University worked with TotalView, a European Space Imaging reseller in Greece, to coordinate the collection of the satellite imagery concurrent to the collection of the field measurements. For them this was the best way to be able to obtain two comparable two datasets. The study proved that information from satellite imagery is of equal quality to the ground-based measurements but can cover a greater area of the vineyard in a shorter period of time. This means that viticulturists who decide to include satellite information in their crop management planning could benefit from improved harvests. The aim is to develop a commercially viable service involving the creation of high-resolution vegetation index maps for winemakers.

GIS publishers team up

PV Publications Ltd, publishers of *GIS Professional*, *Maplines* and other titles are to join with Geomares, publishers of *GIM*, the website *Geo-matching.com* and other international titles. The two companies will establish a new business in the UK to manage and publish titles addressing both the UK and international English-speaking readership in GIS and other aspects of geospatial practice and technology.

Welcoming the move, **Stephen Booth**, managing director of PV Publications Ltd said, "This is an exciting move for our readers. Demand for information about all things geospatial has never been higher. By combining with Geomares we will be able to move forward and improve services to our readers worldwide".

Geomares will be establishing a new company in the UK to continue publishing and servicing readers of *GIS Professional*, *Geomatics World*, *Maplines* and other titles of PV Publications. It is understood that the new company will commence trading from 1 July 2016. Stephen Booth will continue in his editorial role for the titles for the present time.

Commenting on the move, **Durk Haarsma** of Geomares said: "We are very happy to announce this step, convinced that readers of all our publications – print and online – published from The Netherlands and the United Kingdom will benefit from the synergy between the established brands of our respective companies."

£4 return for every £1 spent on council address and street information

A GeoPlace commissioned study projects net benefits of up to £202 million by 2020 from better use of the address and street

data that councils create and maintain. Based on the current rates of adoption, this represents a Return on Investment, after discounting, of 4:1.

The research provides a cost/benefit evaluation of the impact of address and street data that GeoPlace collates, across England and Wales. The study was launched at the GeoPlace annual conference at the end of April 2016 by **Andrew Coote**, director of ConsultingWhere, who was responsible for the research. The research outlines the benefits afforded to local authorities in a number of areas including: reduced data duplication and integration, improved tax revenues, channel shift and route optimisation in waste management.

While emphasising existing benefits and savings from the data enjoyed by councils, Coote warns that the returns could be significantly higher if barriers to adoption, particularly around access to funds, staff retention and improved national collaboration are addressed. He argues for a "Sustained marketing campaign based on the results of the study - maintaining current staff levels; 'speaking the language' of the chief executive and piggybacking on to existing national initiatives such as the DCLG's Troubled Families programme." For more on Coote's study and the GeoPlace annual conference turn to page 16.

Safety and the Dark Web

Tor (The Onion Router) network is also called a dark web as it provides access to completely uncensored unregulated online content. There are currently an estimated 2.5+ million users daily, with over 1 million per month using it to access Facebook alone. Users include activists reporting from abroad on bad labour practices or to

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share sensitive information. It helps journalists write from countries where content is blocked, such as Iran where Facebook is blocked.

Although many government leaders have expressed their disdain over Tor's existence, some acknowledge that it is technically impossible to shut down. It is the ultimate expression of Internet freedom, and besides a small percentage of people using it for illegal activity, the Tor Network is widely used by whistleblowers, activists, human rights fighters and journalists, and is easily accessible by simply downloading the Onion browser.

Developers NordVPN point out that when people access Onion websites, they should be careful not to fall victim to attractive offers found there, as they can never be sure who is on the other side of the line. The same rules apply to Tor Network safety as any other Internet marketplace /network: for example, not volunteering personal information, and avoiding deals that look too good to be true. Users should always have VPN (virtual private network) turned on when surfing the dark net in order to protect their information, and should delete/ disable cookies after each session. To find out more, visit www.nordvpn.com.

Surveyors use imagery for feasibility study

Azimuth Land Surveys is using aerial survey data from Bluesky to complete a feasibility study for a proposed new village development in the South West of England. Comprising more than 2,000 dwellings, access roads and village amenities, the initial requirement was for a proof of concept project to evaluate how existing data could be used to inform more detailed studies. Using Bluesky's high-resolution aerial

photography, 3D laser models, National Tree Map data as well as Ordnance Survey mapping, Azimuth completed both the trial and the wider project, saving the client – a consortium of local land owners – the cost of a traditional topographical survey.

The 3D topographical map outputs produced by Azimuth using the data will be used to establish if the proposed village development is viable, help identify feasible options and be used in the development of other project documentation, such as business case, project execution plan and strategic brief. As the project develops, the maps may also be used to inform planning, assessment of environmental impact, budget and procurement options for example, in conjunction with data from a full topographic survey.

25-year celebration for UNIGIS

UNIGIS, the worldwide network of universities cooperating since 1992 in the design, development and delivery in GIS, is celebrating 25 years of online and distance learning. To mark the event join UNIGIS UK for an afternoon of activities to celebrate on Friday 24th June 2016, 1pm (for a 1.30pm start) – 5pm at University of Salford, Digital Performance Lab, Salford Quays, M50 2HE. The occasion will include:

- a discussion panel with guest speakers from academia and industry, including Professor **Bob Barr** (OBE), Dr **Richard Armitage** (University of Salford), and **Rob Sharpe** (Esri UK);
- a poster session showcasing the work of UNIGIS students and staff; and a networking event offering attendees the opportunity to connect with people working in the GIS sector

Coventry gets ultra hi-res imagery



Caption: image shows the Ricoh Arena, home of the Sky Blues, Coventry City FC.

Coventry City Council has taken delivery of the latest ultra-high resolution aerial photography from Bluesky. The 5 cm imagery provides an unrivalled level of detail with road markings and street furniture all visible. The latest imagery, commissioned by the Council and captured by Bluesky in 2015, offers the most up-to-date view of recent development in the historic West Midlands city, which has seen significant changes in the last few years. Users of the imagery across the council are already realising benefits, with a dramatic reduction in site visits and reduced costs.

"The Bluesky aerial photomaps give us an easy to interpret, easy to use, up to date and detailed view of the city," comments Martin Boyle, systems data officer at the council. "By making the data widely accessible. . . we are reducing the need for site visits across a number of departments. This allows officers to use their time more efficiently and intelligently and reduce operational costs."

Coventry City Council is deploying the data to users across the organisation using MapInfo Pro and the recently adopted Spectrum, both from Pitney Bowes. The combination of desktop GIS and web-based location intelligence software currently gives access, via a corporate file-sharing server, to the Bluesky aerial data to around 400 users across the Council; however, this figure is expected to increase.

Primary users are within planning, highways, environment, property and green space departments. Applications within the planning service include review of building works against permissions granted, identification of possible development encroachment, and the visualisation and contextual analysis of proposed developments. Users within the highways department are identifying ground features such as road markings and street signage in order to maintain the highway asset database where it is helping inform and manage a new gully cleaning programme.

and discuss the key issues for those wishing to become GIS professionals.

If you are interested in what GIS can do and would like to find out more, then come along to this free event, where you can meet industry and

university researchers who will be showcasing the kind of work that they do. Attendance at the event is free but please reserve your ticket at <https://www.eventbrite.co.uk/e/celebrating-25-years-of-educating-gis-professionals-unigisuk-tickets-24803976>

IN BRIEF

A call for speakers has come for Trimble Dimensions 2016 International User Conference being held at a new location in Las Vegas, Nevada, The Venetian, November 7-9, 2016. Sessions address some of the hottest topics and ground-breaking trends in Agriculture, Building Design, Construction and Operation, Civil Engineering and Construction, Drilling and Piling, Earthworks, Forestry, Mapping and GIS, Marine Construction, Mobile Mapping, Monitoring, Paving, Photogrammetry and Remote Sensing, Public Administration, Quarry and Aggregates, Rail, Scanning, Surveying, Transportation and Logistics, and Utilities. Potential speakers are encouraged to visit (www.trimbledimensions.com) to learn more about the application process and to submit their abstract. Proposals will be accepted until June 20, 2016.

Aligned Assets are introducing "what3words" into their gazetteer products as a simple way to communicate a precise location based on a global grid of 57 trillion 3 metre x 3 metre squares. Each square has a pre-

allocated fixed and unique 3-word address. For example, the 3-word address for the front door of the what3words office in West London is **index.home.raft**. **Aligned Assets** office in Woking is at **fresh.parent.apple**.

The Open Geospatial Consortium has approved the WaterML2.0 Part 2 - Ratings, Gaugings and Sections Standard as an official OGC standard. WaterML2.0 represents an initiative within the joint World Meteorological Organization (WMO) / OGC Hydrology Domain Working Group to address standards development and interoperability of hydrological information systems at an international level.

WaterML2.0 Part 2 - Ratings, Gaugings and Sections Standard describes an information model for exchanging rating tables, gauging observations, and river sections used in daily operations, including reporting, analysis, modelling and forecasting. The standard can be viewed by following the link under the 'Documents and Downloads' section at: www.opengeospatial.org/standards/waterml.

Strategic partnership for Leica and Esri



Caption: from left to right; John Kerrigan (Leica Geosystems), Paul Synnott (Esri Ireland), Dermot O'Kane (Esri Ireland), Mike Cooper (LGS) and Alexander Macdonald (Leica Geosystems).

Leica Geosystems and Esri Ireland have announced a strategic partnership to offer easier access to critical information for better informed decision making. The move sees Leica introducing the market to the ZenoCollector, the world's first handheld device that combines Esri's Collector for ArcGIS app with the accuracy of a professional GIS handheld data collector, enabling data collection and editing in a simple, user-friendly interface on an ultra-rugged device running Android.

Commenting on the move, Paul Synnott, country manager at Esri Ireland said "Location-based analytics depend upon accurate and reliable data, and more of our customers are demanding better location information to support their enterprise decision support processes. The partnership with Leica Geosystems, and in particular their ZenoCollector, enables us to respond effectively to these demands."

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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

I FINISHED SCHOOL AT AGE 22 with two degrees and few skills. As one senior consultant put it when I was an intern at a consulting firm, I knew "how to read, write and think." And, that was a good thing because it meant I could read hundreds of pages, pick out the key details, and compile them into a 20 slide presentation for a corporate client. Of significant importance to that same senior consultant, I could do that far less expensively than he could. I did just that and everyone, including the client, was happy.

At that same job I made myself invaluable, for better or worse, by learning AutoCAD. I could digitize the rough sketches of the engineers and biologists relatively inexpensively. I did quite a lot of that and everyone, including the client, was happy.

I learned a lot at that internship, which later turned into a job. The big business concept I took away was the fact that consulting the client could have the deliverables, with just two of three properties: fast, cheap, accurate. Moreover, I teased out, in most situations, consulting does not scale since to do more you need more people, and people are expensive! The firm I worked for declared bankruptcy ten years after I left.

the same order of magnitude as in the past.

The fact that government employees and industry leaders know they need geographic tools, and can select and begin using them without handholding, suggests GIS vendors and consultants, from the 1990s up to today, have been successful. It also means more students coming out of school are not getting jobs, despite regular indications that there are not enough geospatial practitioners. I saw an article just this week noting Namibia needs more technologists with spatial skills!

What's happening, as I see it, is that more and more of the tasks geospatial analysts and technicians did back in the 1990s and 2000s are automated. There are some people "doing GIS" for sure, but others are putting them out of work by "writing the code that writes the code" and "writing the code that makes the maps." Nearly every discussion I read about preparing students for the GIS workforce ends with "learn to code."

Humans still welcome! Where are the new GIS jobs? I'm not sure the government and industry are making many new ones these days. Some existing

GIS, Automation and your Future

Adena Schutzberg gives her view on whether people are still welcome in the world of GIS and can more be done in getting people where they are needed.

Technology welcome! I left consulting and I went into GIS. It was still early days for the technology in the 1990s and there was significant demand for individuals to help towns, cities, businesses and utilities automate their map data. Even then the writing was on the wall, suggesting that in time, many of these data automators were putting themselves out of jobs.

I saw evidence of GIS users leading the charge in putting themselves out of jobs right in my office! One of my colleagues "wrote the code that wrote the code." Jump forward 20 years and more towns, cities, businesses and utilities can select and, to some extent, implement GIS on their own. They can test out a cloud service without installing anything. They can take free online courses to learn the software. They still lay out some money for consulting, but I don't believe it's at

GIS positions, including those that involve coding, will provide temporary job security. Others, that involve combinations of technical, people and industry skills, are likely to stick around for the long haul. I'm thinking of managers, for example, who can create order out of a team of people in part because they understand the technical problem they are trying to solve but also because they can motivate and manage people. I'm thinking of industry specialists who can code with GIS tools, but also have industry knowledge in a discipline like forestry or business.

Those seeking jobs in GIS in the twenty-teens (2013-2019) can expect coding to be part of their skill set, but it won't be the only thing that keeps them employed until retirement.



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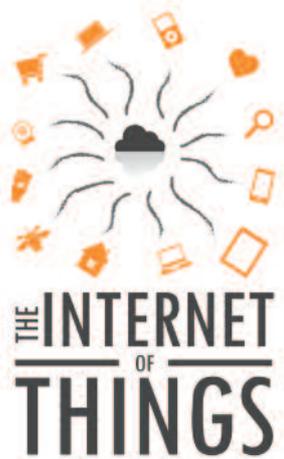
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ACCORDING TO THE BLURB, the Westminster eForum provides 'the premier environment for policymakers in Parliament, Whitehall and regulatory agencies to engage with stakeholders in timely discussion on public policy relating to technology'. To this end, the forum offers numerous seminars on a wide range of topics (www.westminsterforumprojects.co.uk).

On March 15th the subject was the Internet of Things. As it turned out the only parliamentarians present were an MP – **Matt Warman** and the **Earl of Erroll** from the House of Lords, who also happened to be chairs of the two sessions. There were a number of representatives from government departments, including a contingent of eight from the Department for Culture, Media and Sport, some academics and the rest from the private sector. The event only lasted the morning, but it was a full morning of short talks and question and answer sessions.

Rapid growth Emerging technologies always seem to attract large numbers when it comes to predicting the eventual size of the market. The revenue from IoT is still considered small, at £2bn last year, but market growth

the money? **Roger Bickerstaff** is a partner at Bird & Bird and offered some insight. He drew parallels between the stage of development of the IoT with that of 'cleantech' seven to eight years ago. For those of us who have never heard the term cleantech, it refers to the renewable energy industry. Currently, in Britain, the funding for IoT projects comes from corporate equity, whilst in other countries, such as South Korea, there is public sector money involvement. For investors, the issues are security of the revenue stream – cleantech in Britain was boosted by feed-in tariffs, regulatory compulsion and standards. Standards, or lack of them, was a common theme throughout the morning.

In the question and answer session following these talks, the importance of energy harvesting was stressed, and likewise the need to minimise sensor power consumption. There was also concern that government regulation is needed but that it has to be proportionate.

Enabling the Smart Home The second batch of talks came under the heading "Enabling IoT: connectivity, infrastructure and utilising commercial networks". **Howard**

The challenge of the Internet of Things

GiS Pro takes a look at a hot button topic which is predicted to be disruptive rather than evolutionary. Backed by corporate equity the IoT is held back by standards but developers are urged to think holistically.

is claimed to be 20 – 30% year on year, reported **Tom Rebbeck**, research director, Digital Economy at Analysis Mason. He observed that the technology is currently at the stage of solving existing problems more efficiently, thus saving money. Development is being held back by the lack of standards. For example there are four standards for low power wide area networks. Going with the wrong standard could be costly.

The challenges **Gary Barnett**, chief analyst, software at Ovum set out five challenges, or as he termed them – mountains to climb: the things (sensors), communications, security, integration and the fact that the IoT is pointless if it doesn't provoke action. Developers have been tending to use silo thinking to focus on the mountain with which they are most familiar, rather than taking a holistic view. He stressed, for example, the importance of embedding security into devices early in the design process, rather than trying to retrofit as an afterthought. No-one, he suggested, wants their oven to be under the control of a hacker. The IoT is being fuelled by dramatically falling prices of sensors, following the patterns that we have seen elsewhere. Barnett said that today there are sensors costing just £1 that can do the same job as a sensor which cost £5,000 a few years ago.

Financing So the technology is there – what about

Benn from Samsung R&D pointed out that not only is there a multiplicity of standards, but there's also a multiplicity of standards bodies! Samsung manufactures white goods and so is focusing on the 'smart home'. Their solution to the standards problem was to invent a new one via the Open Connectivity Forum, a body with 200 members. They are currently writing standards for 5G communications.

Enabling IoT in cities **Paul Wilson** is managing director of 'Bristol is Open' (www.bristolisopen.com/) – a joint venture between the University of Bristol and Bristol City Council. He described how the city is taking a leading role in providing the infrastructure for the IoT, to develop a "super connected city". He has been fortunate because Bristol was able to purchase existing conduit to install its own fibre within the city, which they have supplemented with a mesh bouncing between lampposts. There are few cities in a similar position of being able to install their own network.

Bringing services and sensors together Following a much-needed break, the seminar resumed with sessions on standards. The chairman, the Earl of Erroll, noted that standards help innovators avoid getting locked-in to proprietary systems. **Nick Chrissos**, head of innovation technology at Cisco UK and Ireland is working on bringing sensors and services together. One example was flood prediction, where Cisco is working with



... market growth is reported to be 20 – 30% year on year.



Scottish Water, the Met Office and Glasgow City Council. On the subject of security, he mentioned the difficulty of incorporating security on a sensor costing \$2, which may remain operational for twenty years.

Smart power Perhaps the most interesting talk of the day came from **Lucy Symons**, policy manager at Open Energi. Her company is looking at the potential for the internet of things in the electricity supply industry. The industry requires real-time action to match supply and demand, and to make use of the increasing potential for storage. Not only is the IoT the missing piece in the renewables industry, with its changeable patterns of supply, but it also has the potential to reduce the need for power stations which are currently needed to supply peak demand. Smart Power exploits the flexibility that the IoT brings and the savings are obvious.

Legal issues **Emma Wright**, a partner in lawyers Bond Dickinson mentioned spectrum but concentrated on data. There was an assumption that much of the data for the IoT would be open and so could be affected by privacy issues. Also, whilst it is easy to persuade government to make its data open (having overcome the data protection thing), private companies tend to be more reluctant, and like to be paid. There is also the question about who owns the data and one way to avoid the problem is not to store it, apparently.

Disruptive tech In an excellent talk, **Dan Byles**, chair of SmarterUK and vice president, corporate development at Living PlanIT contributed to a session on policy, regulation and business practice. He believes that development will be disruptive rather than evolutionary because the IoT is predicated on dramatic changes in costs to make new processes and systems viable, very quickly. For example, he took the Uber business model: the company is now the world's largest taxi company but it does not own a single taxi. As other speakers had suggested, the technology will move from solving existing needs more efficiently towards dealing with emergent needs.

Telemedicine **Chris Francis**, director, government relations at SAP, reckoned the origin of the IoT was 1874 with an 'app' for predicting avalanches. This was taking things a bit too far! Back down to Earth and he mentioned telemedicine. This subject had arisen earlier in the context that apps that seem trivial can end up being world-changers. Imagine, for example, the potential impact on the NHS if everyone wore monitors for bodily functions.

This was a useful seminar in pleasant surroundings at Glazier's Hall near London Bridge. For map lovers there was the bonus of an historical map of London on the wall which was well worth perusal. Visit: www.westminsterforumprojects.co.uk/forums/index.php?fid=westminster_eforum



... development will be disruptive rather than evolutionary. . .



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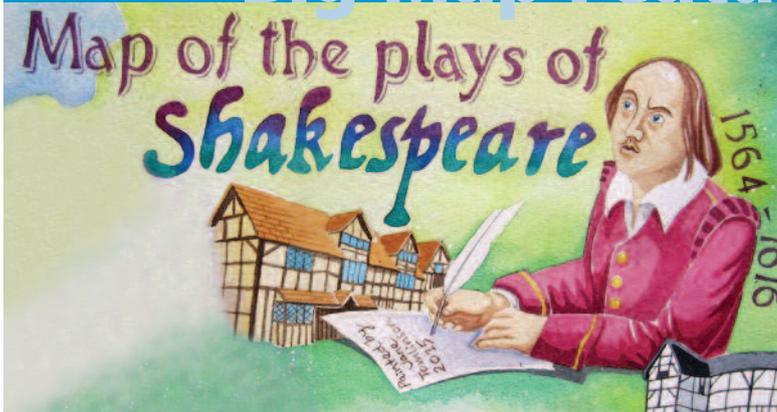
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GiSPro's Big Map Feature



Why I painted the map William Shakespeare is a towering figure in my life. I too was born and bred in Stratford-upon-Avon and his influence permeated my childhood. At primary school we got a day off on Shakespeare's birthday to take part in the town's celebrations. As a small child, he was as important to

considerably, and abandon any notion of 'to scale' entirely. Think of it as a visual pantomime. Luckily, many plays have more than one location, so Shakespeare built in a bit of wiggle room for me. *Henry V*, for example; on my map he's over in northern France, a nod to Agincourt.

I tried not always to use the 'obvious' or most famous quote, but to find something else that gave a flavour of the main themes of the play or a particularly dramatic moment. For example, in *Julius Caesar*, it would have been so easy to go for 'Et tu, Brute', or 'Friends, Romans, Countrymen. . .'. But the irony and pathos of 'Brutus is an honourable man' is, I think, way more powerful.

Shakespeare purists might wonder why Sir John Falstaff is the only character depicted in his own right. He appears in three plays and was a hugely popular character among Elizabethan audiences. The

A hand-painted map of the plays of William Shakespeare

To mark the 400th anniversary of the death of William Shakespeare on 23rd April 2016, artist **Jane Tomlinson** painted a schematic map in his honour, showing all The Bard's plays in their approximate locations.

me as Father Christmas! Decades on, and now with a much deeper understanding of his genius, it seemed only right that I, a girl from Stratford, lover of the English language, and painter of maps, should attempt to depict all his plays on a single sheet of paper.

It's a very simple idea: put the plays in their approximate geographic position. In the north there's *Macbeth* in Scotland and *Hamlet* in Denmark. In the south, *The Tempest* in the Mediterranean and *Antony and Cleopatra* in Egypt.

Which ones to include? There were many questions to be answered before I could even get my brushes wet. I have seen maybe 50% of his plays over the years, and I thought I knew a fair bit about Shakespeare. It turns out I knew very little. So this painting has been a fascinating way of examining each play to discover its essence and themes. But which plays should I include? In the end, I went for all those featured in the *First Folio*, plus *Pericles*. Shakespeare aficionados may argue about the lack of *Two Noble Kinsmen* or no referencing of the 'lost plays'.

Each play's title is shown alongside a quotation and an illustration to give something of its flavour. The bulk of the plays take place in the British Isles or in Italy, and to squeeze so many in to such a small space on the paper would be impossible. I had to distort the underlying drawing of Europe

only reason he's sitting in the Netherlands is that there was a convenient space in my composition to put him there!

Another point of controversy might be putting *As You Like It* in the heart of England. Some suggest that Shakespeare was referring to the Ardennes Forest in Belgium. I think it is more likely that Shakespeare is referring to the Arden Forest – his and my home turf – which in the 17th century stretched north from Stratford.

A Bard for all time I wasn't commissioned to make this painting, it was just a bit of fun for me and a way of learning more about my fellow Stratfordian. Including research time, it took me six weeks of my so-called spare time to complete.

Ben Jonson said of Shakespeare "He is not for an age but for all time". That a boy from an insignificant market town in leafy Warwickshire was able to observe such deep universal human traits, and convey them with such creativity is remarkable. That's precisely why I painted this map.

• **Prints of the Map of the Plays of Shakespeare are available at** janetomlinson.com/artworks/shakespeare-map/

This article first appeared in the Spring 2016 issue of *Maplines*, the newsletter of the British Cartographical Society.



... painting has been a fascinating way of examining each play to discover its essence and themes.



GiSPro's Big Map Feature



Buy a signed copy of the map

To commemorate 400 years since the Bard's death, readers of *GiSPro* can buy a large signed print of Jane Tomlinson's magnificent map painting of all of the plays in their approximate setting.

The original painting is not for sale, but prints are available, size A2 (420 x 594mm) on archival quality paper, signed by the artist, and come to you rolled in a sturdy postal tube. Price £30 including P&P to UK addresses. To buy go to:

janetomlinson.com/artworks/shakespeare-map/

Not in the UK? Please jane@janetomlinson.com for a price to include international postage



A sandwich man awaited visitors arriving by tube at Angel station.

INEVITABLY, DELEGATES HAD TO MAKE CHOICES between concurrent conference sessions and workshops, whilst also catching up with friends and colleagues. This year it was made a little easier as the conference was concentrated into a single stream and the workshops became five streams.

Robots and 'us' The first session of the first day started with inspiration in spades. **Tom Cheesewright**, an 'Applied Futurist' gave the audience his vision of the geospatial future. The future is, according to

the 'toothbrush test'. The toothbrush is a necessary part of our lives and we buy one regularly. The aim of Google is to deliver products that pass the toothbrush test. He suggested that Google Maps, with a billion users has passed the test. Arguably, Google Glasses did not pass but Cheesewright suggested that augmented reality is yet to have its day, so perhaps the glasses will eventually pass the 'old toothbrush test'.

Parsons structured his talk around hats. We started off with a construction hard hat – no stereotyping there then. This is worn by 'traditional' geospatial people with a reverence for precision and care, and a reputation (deserved or otherwise) for protectionism. Then along comes the 'hipster hat', worn by people who hide complexity behind APIs and make our precious geospatial data available to everyone. They give access, just as Uber gives access

Something for everyone – GeoBusiness buzzes

GeoBusiness returned to the Islington Business Design Centre for its third year with a larger exhibition, more visitors and, if anything, an even buzzier atmosphere. The industry's biggest players seemed to have bigger stands and more new suppliers were displaying their wares, reports **Richard Groom**.

Cheesewright, a mix of human and machine, where the machine does more thinking than it does today. It was interesting, but perhaps somehow obvious and perhaps a little spooky, that he predicts that machines will have the same sense organs as humans. They will be able to see and hear and react according to their senses as well as analyse what they see to determine what to do next. The future, Cheesewright says, is a synthesis of the physical and digital organic living built environment which can develop and evolve, populated by autonomous organisms... and 'us'. Unfortunately every 'autonomous organism' in sci-fi world is of the competitive rather than the collaborative kind. Clearly they will need to get on board with BIM!

Setting aside concerns about world peace, this brave new world is good news for 'geospatial', because, as we know, everything happens somewhere, so the autonomous organisms... and us, will need map data to find our way around.

Clumsy cars, toothbrushes and hats The euphoria brought by this thought was however short-lived, as **Ed Parsons**, from Google, said that navigating is actually the easy bit. The bigger concern for the Google car is bumping into objects that have not been mapped, such as other road users. He introduced us to

to taxis, without owning any vehicles and without the user having to master the intricacies of GIS.

Clever tractors Professor **Gianvito Lanzolla** from the Cass Business School asked 'what triggers digital transformation'? His answer was converging technologies. He gave two examples. The connected tractor is a tractor with technology to ensure that it delivers fertiliser in the right quantity to the right part of fields, so it is using GNSS, remote sensing and communications. Similarly, Rolls Royce monitors its aero engines throughout their working life so that the company can target maintenance – reducing aircraft turnaround times and reducing risk of failure.

Addressing the world Gary Gale from what3words said that maps on their own are not enough and that the distribution of geospatial data is not uniform around the globe: London is bathed in it whilst in other places is it sparse. He claimed that 75% of the world has an inadequate, poor or no addressing system. Even in Britain he was able to quote negative house numbers, the same house number and street name four miles apart amongst a dozen similar examples. His company's solution is to divide the world into three metre triangular tiles and assign three words to each one. Three words are easier to communicate than latitude and longitude.

Technology and society Parsons, Lanzolla and Gale then joined chairman **Andy Coote** on stage for a panel discussion on the subject "Emerging technology

Riegl showed off the ROBIN scanner pack on their stand.





and applications – how to examine the societal benefits of what we do”. Like the opening pages of ‘A Tale of Two Cities’, discussion centred around opposites and contradictions: freedom v. regulation, privacy v. accessibility, society v. technology.

Regulation, the panel pleaded should be informed and should not stifle. Privacy is viewed differently by different cultures and indeed age groups, with younger people more willing to be open. The problem is not so much the handing over the data as ensuring that it is used for the purpose it was intended and nothing else. Rigor and freedom were also debated, with a consensus that it is the product that is important and should be subject to appropriate standards and regulation, not processes and certainly not process for process sake. Other discussion points concerned the ‘democratisation’ of data and the pros and cons of large monopolies against SMEs. In Silicon Valley monopolies are seen as ‘good’ because they are able to sustain innovation, whilst in Europe we put greater value on the competitiveness generated by SMEs. But are we happy, said Lanzalla, to see the monopolies take all, whilst everyone else fights over the scraps?

Meanwhile in the exhibition... Outside the conference and workshop sessions there was plenty of activity on the exhibition floor. Indeed the level of interest even held up well on Day 2, which bodes well for the future.

Viewing GeoBusiness a few days after the event, it was certainly a success as the exhibition grows and organisers Diversified Communications discover what does and what does not work. For this reviewer the highlight was the panel discussion on the first day. The exhibition had a friendly atmosphere and nothing seemed to be missing: whoever you needed to see was there.

Overall, the conference is perhaps not quite there yet. There is value in independent technical presentations but delegates could choose only between high-level talks in the conference or workshops from suppliers that would inevitably be biased towards their wares. Also, over a hundred people submitted abstracts to the organisers and consequently many will surely have been disappointed. Hopefully they will not be put off from offering their contributions next year.

With every year this event gains confidence and momentum. And that must be good for us all.

It was two very busy days but with plenty of time for networking.

In the workshops

Big data Externix Ltd showed off their new server solution for big data – Blaze Hub. The server handles big-data with ease which means once you’ve captured the data, you can instantly view a 3D model using their Blaze Terra software. It does this by storing the data in a simple way to allow quick and easy access. You can then back up the data onto their servers and access it anywhere you need it. This saves time both on-site and back at the office as you can get a rough idea of the data you’ve captured and know there and then whether you have what you need.

Vexcel After giving a brief overview of their existing cameras (UltraCam Eagle Prime and UltraCam Osprey Prime II), Vexcel Imaging unveiled the UltraCam Condor due for release autumn 2016. The camera is designed for high-altitude mapping and can boast being able to capture large regions in record time thanks to its fast frame rate and being able to operate at high aircraft speeds. It also captures hi-res RGB, panchromatic and NIR data in a single pass, saving valuable time and keeping costs down.

We then got introduced to their fully integrated UltraMap workflow solution which can support unlimited project sizes and has

an automatic colour-balance and de-haze feature when merging 3D models together. To show the power of UltraMap, we had a quick demonstration of different datasets, taken by different methods, being merged into one. They took us from the sky to ground level, then moved along the ground and finally went inside a structure in one fluid movement with a 3D model.

Drones With the hustle and bustle of Geo Business in the background, Aerial Tronics talked about their new sleek UAV, the Altura Zenith. It comes in two models, the ATX4 which is the more basic version, and their flagship model the ATX8, which naturally was the one they focused on. It’s made of carbon fibre, has a maximum payload of 2.9 kg, a flight time of 35 minutes, can travel in wind speeds of 14 m/s and can operate in light rain and snowfall.

The ground-based pilot uses a GPS assisted control system to fly the drone. Pre-installed is ‘sense and avoid’ technology meaning the drone will keep a safe distance from any objects to prevent it crashing. The default safe distance is 15 metres, but this can be adjusted. It also comes with a neat ‘return to home’ safety feature where with a click of a button, the drone can be told to land at the exact point it took off from in case something happens to the pilot. But as they pointed out, if it takes off from a moving ship, you may have to fish it out of the water!

GeoPlace Conference



IT SEEMS INCREDIBLE BUT GEOPLACE is already five years old. Formed out of the former NLPG and OS addressbase products, Geoplace brings together data from Ordnance Survey, the Valuation Office, other

role addresses have played from the time of Edward II when it was necessary to write notes on the front of a letter describing its delivery point to Charles I when the Royal Mail service was first made available to the public, to today when the Geoplace file now contains over 40 million addresses. Hancock's first job was in the family computer software firm where he struggled with magnetic tape and a PAF file without postcodes.

Today addresses are the bedrock of a modern digital economy, he argued – high quality and definitive; and we've barely scratched the surface for potential apps. The mission is to improve the lives of citizens. While letterboxes don't need to be precisely located, postcodes in rural areas can land you in the middle of a field. With a UPRN a definite position is possible and is the jewel in the heart of the addressing system and ready for a world of driverless cars and delivery drones.

Hancock spoke on open data and how the UK was first in the world to go down this path, removing

'I will be your champion' The annual Geoplace event celebrates achievements by local authorities in using addressing to make savings and efficiencies. It was also an opportunity to hear several opinion and thought leaders, including a government minister.

government departments and Royal Mail to create a comprehensive address file listing thousands of individual address points.

Opening Geoplace's 2016 conference in the plush surroundings of Westminster's QEII conference centre, CEO **Richard Mason** paid tribute to the local authorities which are the organisation's foundation. 'Today we are much better recognised by CEOs and politicians', he believes. Intriguingly there's even been mention in the Budget of a £5m sum to set up an "Authoritative Address Register". Watch this space.

Mason reported that OS MasterMap's Highways Network now includes Geoplace's data. On updates he reported that data from the Royal Mail's PAF file is now available on a daily basis and the eventual aim is for real-time updates. A further development is a UPRN (unique property reference number) for health facilities. Subject to personal data protection it could eventually be down to patient level.

Serious interest The event attracted serious interest from government in the form of a short address by Rt Hon **Matthew Hancock**, currently Minister for the Cabinet Office and Paymaster General. He also attends Cabinet meetings. He reflected on the

licences and paywalls. By opening up data he revealed that it is estimated to contribute an extra 0.5% to GDP each year. The £5m mentioned in the Budget for a new open address database could open up a huge potential, he thought. In Denmark, a similar initiative has been estimated to have had benefit factor of 20 times its cost.

Taking a few moments for questions, he was told that too often the work of the address custodian is not understood: it's not a 'Noddy job!' he was told. 'Too right it's not said Hancock, I will be your champion. I feel your pain and make a commitment to champion your cause'.

Best in the world **Nigel Clifford**, CEO of Ordnance Survey spoke about how place and UPRNs matter, 'they map our lives'. He is determined that OS will help GB use place to become smarter. In the US Big Data had helped New York Mayor **Michael Bloomberg** to create a database of dangerous buildings, while nearer home in Manchester there is now a scheme for people to report vacant sites with potential for housing. Clifford reported that there are now 4200 public sector customers using the PSMA (public sector mapping agreement). 'You have the best open data in the world' he was told by a Silicon Valley giant.

Next up was Geoplace's **Steve Brandwood**, head of engagement, with case studies of how address data was 'a platform for interoperability reducing fragmentation'. Using UPRNs in Barnsley the local authority had been able to link eight disparate databases. Moves like this

Below: Matthew Hancock, currently Minister for the Cabinet Office and Paymaster General.



deliver real savings to councils not only in Barnsley but Harrow, Salford, Leeds and Huntingdon. Typical savings can come from previously missed properties which should have been paying council tax.

Savings account Calculating the return on investment in these practices is a rather dry subject, conceded **Andy Coote**. His company, ConsultingWhere had been retained by Geoplace to research savings. Using a combination of literature, questionnaires, training courses, a workshop and a 'peer economist review' his firm had used the PESTLE approach – political, economical, social, technological, legislative and environmental, under Treasury Guidelines for cost benefit analysis.

The area of maximum benefit revealed by the study was around data sharing and integration. Savings in total of £23m with revenue and transport route optimisation contributing £17m and £2.5m respectively.

Meanwhile the barriers to adoption included lack of funds, insufficient management awareness and software limitations. Coote is an evangelist for the benefits of addressing but danger lurks he says in not maintaining a good database. He urged greater collaboration with national bodies like SOCITEM and NESTA and advised looking at EU research and the small cities initiative.

The day-to-day users of Geoplace data are the local authority custodians. 'There were one and a half million changes last year, explained **Cathy Coelho**, principal chair of the Regional Address Group.

This fascinating day which explored in detail how addressing can save substantial sums for the public sector included several break out sessions, a panel discussion and the Exemplar Awards hosted by Juliet Whitworth of the Local Government Association.

Winners The Exemplar Award is awarded to the best example or demonstration of local address and/or street datasets providing quantifiable benefit to the citizen/authority/region/nation.

This year's winner was Leeds City Council for its project to use local address data to verify population estimates. By using accurate data on the number of residential units, where they are located, and which ones are vacant, a far more accurate population estimate is able to be calculated at any period of time.

Using the address data to provide a more accurate population estimate has ensured that the council has access to the most geographically accurate data available reflecting localised changes, to enable them to account more efficiently for current and future service provision such as school places, social service provision and housing needs; and could be used more widely in government to predict localised demand for health services such as GPs and Dentists.

The winner of the Peer Award was **David Lloyd** from Huntingdonshire District Council. Nominated by

their fellow Authority Address and/or Street colleagues in England and Wales, this Award aims to reward contribution to the community, and/or achievement within an authority.

David is an expert on addresses and has been at the forefront of address innovation and integration at Huntingdonshire for many years. He has guided the work of technical working groups, been vice chair and now chair of the East of England regional group for addresses. He has always been very accessible to Custodians, providing advice and guidance to those who are new to the challenges of address management. David regularly runs specialist events such as demonstrations of software modules, for other authority colleagues.

David has been a tireless advocate for the integration of the LLPG into other council systems. The number of awards of winner, runner up and highly commended show just how much effort he and his small team have put into making their LLPG a key part of their council's processes. David is an outstanding example of best practice and is a very worthy winner of the Peer Award.

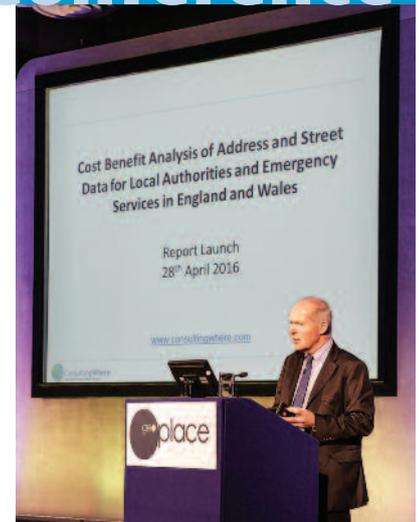
A key focus of the 2016 Exemplar Awards is on those Custodians who have invested time in creating and continually improving their processes and who have made and achieved a real commitment to improving both the accuracy and quality of the data submitted to the GeoPlace hubs. These authorities are recognised within the Data Quality and Improvement Awards.

South Ribble Borough Council and Barnsley Metropolitan Borough Council were announced as winners of the Most Improved Address Data and Most Improved Street Data respectively.

Awards were also presented for Best Address Data in Region and Best Street Data in Region together with Awards for those at 'Gold' Standard – those who have achieved and consistently maintained the highest standard.

Winner of the Gold Achievement Award for Address Data was Telford & Wrekin Council while winners of the Gold Performance Award for Address Data were:

- Wychavon District Council
- Wyre Forest District Council
- Herefordshire Council
- Rugby Borough Council
- Stratford on Avon District Council
- Shropshire Council
- Cannock Chase District Council
- Lichfield District Council



Above: Andy Coote - analysing cost benefits of addressing.

Below: Prize winners from Monmouthshire County Council.





MAY SAW ESRI UK'S biggest yet user conference. Held in the QEII conference centre in Westminster, the event attracted over 3,000 pre-registrations drawn by the opportunity to attend a choice of 60 individual sessions spread over seven tracks from keynote presentations, special interest groups and workshops.

Sustainable design and GIS There followed a series of keynotes before we broke out into individual sessions. **Bruno Moser** and **Theo Malzieu** of the design practice Foster & Partners, which specialises in tailored and sustainable design solutions for anything from a great bridge to a table lamp. They have even worked with NASA on

Esri lights up the enterprise

A busy day at Esri UK's annual conference left your reporter exhausted but satiated with geography and GIS.

Launching the event under the banner "Lighting up the Enterprise", Esri UK MD **Stuart Bonthrone** spoke on change driven by the technology of GIS. Robust websites, rich libraries of content are all helping to personalise information for users. We are seeing the consumerisation of IT. The challenge, said Bonthrone, is to spatially enable the rest of the enterprise. He cited the National Grid where connecting the workforce is reported to save £35m a year.

Below: Stuart Bonthrone kick starting the day.



inflatable pods and 3D printing robots to sustain life on Mars (fortunately for Foster a map is on hand to locate it, as we shall see).

Foster 'thinks big' on urban design through interdisciplinary cooperation on projects which puts people at the heart: projects like the Reichstag, British Museum and Swiss Re (aka the Gerkin). Moser spoke about their roles as "urban designers". They first map the topography and environmental patterns to analyse land use. As an urban designer he focuses on the space between buildings, the public realm. A typical example is Trafalgar Square in London where the solution was to close the traffic lane in front of the National Gallery. To do all this Foster use GIS to create a spatial representation of the design. In London, 3D spatial analysis is essential in a city where a third live within a ten minute walking time of a tube station.

His colleague Malzieu contrasted London with the Saudi port city of Jeddah, which has grown substantially since the 1970s to the point where it now spans 50 kms from north to south encompassing 3.5m people. Although the dense central area of alleyways in the old city of Al Balad remains mainly unchanged, the rest is large blocks with wide sprawling roads. Foster analysed the metro network and found that only 12% of the population lived within 10 minutes walk of a metro station. Their solution is to attract people away from the



Left: Nigel Clifford talking everything from smart cities to mapping Mars!

roads (96% of all journeys are by car) by extending the stations into the road space to create shaded areas where commerce and other activities, above and below ground, can flourish. Jeddah does not have identifiable street names or building numbers so mapping of local land use and the road network was essential ahead of development around the metro stations, which could be at higher density than hitherto in the city.

Mapping everywhere A keynote from the event's Platinum sponsor heard Ordnance Survey CEO **Nigel Clifford** talk about "the changing face of geospatial". The nation's mapmaker is launching a series of APIs and is involved in autonomous vehicles, smart cities, 5g, asset management as well as initiatives like "Innovate UK" which is behind Manchester's City verve, a project looking at how it can be made smarter. OS has even been mapping Mars. . !

Esri UK chief technology officer **Charles Kennelly** then took the stage and began by showing us a rather depressing map of mass shootings in North America. The map, of course, really just tells you where people are. But by overlaying demographic data it is possible to reveal shootings per head of population or the relationship between access to guns and mass shootings. The map went on the Internet and generated 530k hits within a few days. For Kennelly it was an interesting moment because as they created the map they were talking about GIS, mapping and spatial relationships rather than technology, which is what they normally talk about. Indeed Esri are now looking to employ GIS people rather than IT people.

Kennelly believes we're living through a "Golden age of GIS", a change from systems of record to one of engagement. During the last year, activity for ArcGIS Online saw year-on-year subscription growth of 31% (from 24,000 to 31,000) and activated users grow by 71% (from 250,000 to 367,000). Background base maps have grown from 22 to 34 billion.

Drone app Next we moved to the rapidly emerging world of drones. **Carmel Connolly** introduced us to Drone2Map, an Esri app which exploits the opportunity of cheap data capture by converting

aerial imagery from a UAV to 2D and 3D products in the ArcGIS environment. Following a striking video captured by a drone of Waddesdon Manor and its surroundings, Esri staffers **Sarah Lewin** and **Richard Mumford** demoed the capabilities of the app using a handheld iPhone as the image capture device; and the scene. . . ? A doll's house! Mumford wandered around the model capturing images with his phone then downloaded them to Drone2Map which mosaiced them into a georeferenced TIF file. The app runs under Windows and has three modes: rapid for quick, low-res output; a high-res professional mapping mode; and an inspection mode.

More seriously Esri has cooperated with the National Trust and the Animal Health & Plant Agency. Both organisations see potential for using drones to capture data of their assets and for inspections.

Choice, choice, choice. . . but where to go? As the day moved on choice loomed large and your reporter settled for sessions in the "Gain Insight" and "Lighting up the Enterprise" tracks. Situational Awareness is essential today to any active service, security or military organisation. The UK Hydrographic Office has adopted what older readers might call the Martini approach – anytime, anywhere it's. . . situational awareness on the high seas.

Simon Hampshire of UKHO introduced Future Maritime Geospatial Concepts (FMGC), a system with eight layers of imagery, charts showing seabed features, underwater features, land mapping etc that includes activities as diverse as volcanic, hurricanes to piracy. This is a serious Big Data application. It also records the traffic density of shipping around the world in near real time including keeping an eye on suspicious vessels and navigational warnings.

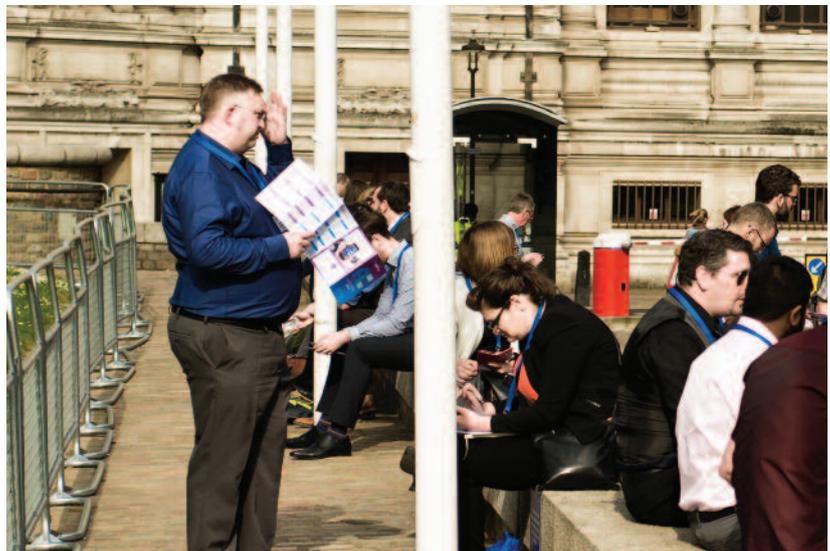
Rondalyn Northam is Gloucestershire Constabulary's GIS manager. She is responsible for something called the "Local Policing Dashboard"



. . . a "Golden age of GIS", a change from systems of record to one of engagement.



Below: Which track to choose? It was a hard choice for many delegates.



ESRI Conference 2016



Above: Just one seat left.

which maps vulnerable communities. The dashboard can call up geographical datasets like income deprivation, burglary, employment levels amongst 16-24 year olds, the location of recent crimes and educational attainment demographics. They use methodologies prescribed by the Jill Dando Institute such as VLI, the Vulnerable Localities Index.

Retail GIS analysis The use of GIS in location planning for the retail and business sector has been used by a few brave pioneers for years. But today, can any large retail chain seriously operate without it? **James Nolan** of Knight Frank explained his role as a survey analyst in seeking prime locations for hotels, offices, retail parks and supermarkets. Drive times are mapped, existing (and likely competing) facilities located and linked to open data from the census and other sources. Demand for this data will vary between clients. A premium coffee shop operator will want to know nearby places of work and staffing opportunities while a furniture retailer will want to know the postal geography for typical market spend, geo-demographics of target customers, etc.

Nolan explained how a rule-based GIS approach was used for a German food discount retailer keen to mitigate risk in his investment. They needed a population of at least 10k within 1 mile radius of the proposed location but also travel times in the area. The final analysis comes down to street level. All of this can be done from Nolan's desk in Baker Street, London!



... a rule-based GIS approach was used for a German food discount retailer keen to mitigate risk in his investment.



Scary stuff in the hills It's always surprising just how many diverse and odd applications GIS can be used for. The Ministry of Defence retains a unit within the Royal Air Force Police to look into complaints from the public about noise from low flying aircraft. Retired geography teacher **Derek Allen** is part of the unit; he showed us an awesome video of low flying through hilly terrain from the cockpit viewpoint; scary stuff indeed.

Our military pilots have to train for flying down to 500 feet and they do this in areas like the Lake District and other wild and mountainous places, which may not be very densely inhabited but

nevertheless do attract plenty of visitors ready to have the pants scared off them by low-flying jets. The unit's 2000 or so complaints a year are assiduously investigated by Derek and his team and in some cases compensation is paid. A new camera purchased for a walker who was so frightened he dropped his in a lake; a koi carp that jumped out of a tank was also compensated for, though not a trip to Japan which the owner claimed was necessary to source the replacement!

Crime and forensic analysis Another unusual application came from Durham Constabulary where Detective Superintendent **Adrian Green** was heading up an inquiry into a spate of thefts from museums of rhino horn, jade and other Asian valuables. An international crime gang was at work hiring local villains to break into the museums to steal to order. Eighteen pieces lost from Cambridge's Fitzwilliam Museum are believed to have been worth as much as £57 million.

Green set to work with his intelligence analyst **David Worsnop** and his ArcGIS system under what was titled Operation Griffin. Some 200 phone numbers were carefully tracked along with data about 20,000 vehicle movements connected to 30 incident locations across the UK - some 360,000 map points. Eventually 24 arrests were made and 14 people convicted and are now serving a total of 72 years in gaol. Result, as they say.

Another crime related use of GIS heard from **Alastair Vannan** of Cellmark Forensics Services. His presentation had the catchy title of "Forensic remote research: GIS, UAVs and the search for the missing presumed dead" – in fact this turned out to be presumed murdered. Vannan is a specialist in forensic archaeology so he is familiar with technologies like lidar, hyperspectral analysis of soil and vegetation and importantly: integrated data analysis using GIS. The project was to locate what was believed to be the grave of a missing person believed to have been murdered. A UAV survey and a micro topographic

Below: Alastair Vannan of Cellmark Forensics Services





Left: Paul Hart - the answer was tablets.

analysis and anomaly interpretation were all applied in this fascinating account.

Survey by tablet Developing an integrated approach to asset management was the title of a presentation from **Paul Hart**, GIS manager Europe for Black & Veatch. This was all about locating and creating an asset management system of London's numerous cable pits; 47,000 approximately at the last count. These innocuous features covered by reinforced concrete or steel covers may seem perfectly safe and inert but there have been a number explosions caused by gas building up within them.

The first task for Hart's surveyors was to visit the pits, inspect and categorise them from medium, low to high risk as well as judging their condition. It was a huge undertaking as every one required a permit to access. The first task was a simple risk prioritisation exercise from the desktop. Three-man inspection teams spread out across the capital equipped with old maps and drawings and tasked with capturing the data within six weeks. A tall order. They found that 20% of the pits no longer existed or were buried beneath pavements and tarmac and presumably redundant. A lot of time was wasted in sending teams to these locations.

A traditional data capture approach was used initially based on GIS maps as printed paper PDFs. This method is very labour intensive – two people were needed to sort and allocate the maps before they were couriered to site. Once they were used on site and information updated they had to be passed back to the office for interpreting and data entry. In all, 23 people were involved in capturing the data. 'We were paid on a per pit basis'

The next move that Hart took was to become Esri licensed partners enabling them to have access to all Esri's software so they could trial applications. Next, a tablet was purchased, trialled and then inspection begun of the low risk pits using data that published to the cloud. As there were only 23 people on the project and time was of the essence a subcontractor was engaged. But they didn't have the Esri software so Esri for Excel was used, which gave the user's tablet a map and a database of pits for updating.

Hart explained that they also used Esri Dashboard and tracker enabling them to see where surveyors were at any given moment as well as showing pie and bar charts of the survey's overall progress. Using

this approach reduced the manpower to just three roles and 10 people compared to 10 roles and 23 people. After a few days of using this method the project manager said 'we're never going back!' We no longer do paper surveys within Black & Veatch, concluded Hart.

Getting round London The London Marathon has been run since 1981 and is one of the capital's signature events. But it does cause considerable disruption to the lives of Londoners and those who still want to get around the city. **Adem Besim**, a keen sportsman and road user, is a GIS officer for Transport for London and had an idea to help people get around the capital when major events are on. He presented his idea – a simple data stream to a satnav – to a "Dragon's Den" type event run by TfL's management to hear proposals for ideas from employees that could help manage the road closures and lessen their impact.

Besim's TfL Events to Satnav Project aimed to integrate GIS data captured from road closures during major events in London and transfer this knowledge to satnavs and smartphones to alert Londoners of the closures. Working with TomTom, the data was distributed and helped lower the impact of the 2016 Marathon by 2%.

Mapman's great age of geography The day concluded with a series of awards for customer success and a great presentation from TV's "Mapman" **Nick Crane**, currently president of the Royal Geographical Society. Crane has done some spectacular walks: from Santiago de Compostela in Spain to Istanbul and the line of Ordnance Survey's cartographic meridian for Britain. He argues that the great age of geography began 500 years ago with European explorers visiting Asia, the Americas and Antarctica. It was also an age of young techies like Frisius who first used triangulation for mapmaking and Mercator, who he described as "the prince of modern geographers" for inventing the atlas and the ubiquitous projection still in use today.

'Today, geography has maps hanging from every branch and is even on the National Curriculum. The world has been revealed as never before'. Nevertheless, he had encountered naysayers in his travels. His travels and TV programmes caused *The Daily Mail* to call him a "prat" while the *Daily Telegraph* praised him as a "genius".

The final address came from Kennelly who updated delegates on Esri's product roadmap and the changes expected. They vary from moving a button on the display to better analytics for Big Data and Smart mapping in 3D. Watch this space.

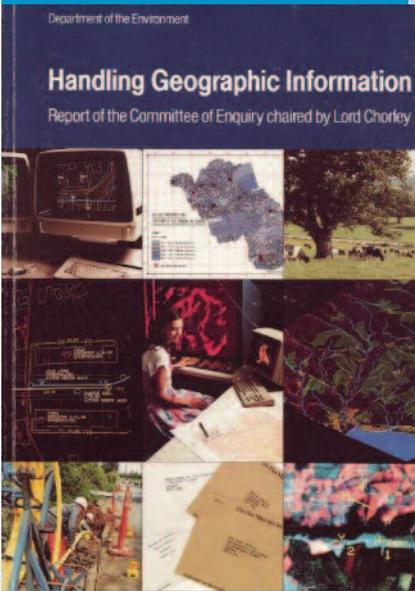
Below: Adem Besim talking all things transport.



After a few days of using this method the project manager said 'we're never going back!'



REMEMBERING Lord Chorley



The Chorley Report of 1987 was the trigger for the founding of the Association for Geographical Information, the AGI.

THE CHORLEY REPORT was launched in late 1987 at the Royal Geographical Society. Commissioned two years previously with the remit "to advise the Secretary of State on the future of handling of geographic information in the UK, taking account of modern developments, information technology and of market need" it was a ground-breaking report that led to the founding of the AGI (although that was not Chorley's recommendation).

Below we publish the personal recollections of some of those who knew and worked with him on the report.

Treasury, then the whole report would lose credibility."

"Our 30 committee visits took us around Britain from Aberdeen to Southampton. Word soon got round that Lord Chorley liked smoked salmon. So, without exception, we had smoked salmon in some form or other for our lunch at every venue. Thirty years later I can't eat smoked salmon without remembering Roger."

Ian Masser Ian Masser recalls first meeting Roger Chorley at the Royal Geographical Society soon after the report of his influential Committee of Enquiry into Handling Geographic Information was submitted to the British Government. "Over the next few years I was closely involved with the events that followed its publication in my capacity as the national coordinator of the Economic and Social Research Council's Regional Research Laboratory (RRL) Initiative. These included the establishment of the Association for Geographical Information in 1989 and the US National Science Foundation's National Centre for Geographic Information and Analysis in 1988. Although the Government missed the opportunity to implement one of its key

Lord Chorley and the emergence of GIS

The recent death of Lord (Roger Richard Edward) Chorley, born 14 August 1930, died 21 February 2016, provides a critical moment for reflection on the beginnings of GIS in the UK. The Chorley Report, he was much more than a geographer, indeed he was as David Rhind in an obituary recounts, he was 'a man with a large hinterland'.

Ian Gilfoyle A member of the Chorley Committee of Enquiry from 1985 to 1987 Ian Gilfoyle recalls a skilful chairman with great wisdom and a love of smoked salmon! "As a chief officer in local government as well as being involved in several regional and national organizations, I spent a great many hours in committee meetings. Against this background I found Lord Chorley to be an exceptionally good chairman – both wise and perceptive. His democratic style encouraged all members of the committee to contribute to each discussion. In fact, he looked for, and knew how to use, the varied abilities and experiences of all members. He did not need to dominate the proceedings but knew how to pull things together when critical decisions had to be reached."

"Roger Chorley used his wisdom and considerable experience to impart direction and purpose to the committee's deliberations. For example, there were occasions when many on the committee favoured a more forceful or controversial recommendation, but he cautioned that if any one of the recommendations in the report could be "rubbished" by the government, especially by the

recommendations to set up a national centre for Geographic Information in the UK, the report itself played an important role in raising public awareness throughout the world of the enormous potential opened up by the emerging field of GIS."

"From the outset I liked Roger Chorley as a person and found him a good listener who was receptive to new ideas. As a lifelong environmentalist with a longstanding interest in things geographical he was the ideal choice to chair the Committee of Enquiry. In 1991 I was delighted when he agreed to contribute a foreword to a book on the methodology and potential range of applications of GIS arising out of the research projects conducted within the RRL initiative which I edited together with my technical advisor, **Mike Blakemore**."

David Rhind Recalling a quietly spoken, urbane and calm man of great judgement and analytical expertise, David Rhind found him someone who was a brilliant committee man and chairman (in the best sense). He was able to achieve agreement within the most obstreperous of groups. The following is an extract from David Rhind's obituary of Roger Chorley



His democratic style encouraged all members of the committee to contribute to each discussion.



REMEMBERING Lord Chorley

written for the Royal Geographical Society's Journal.

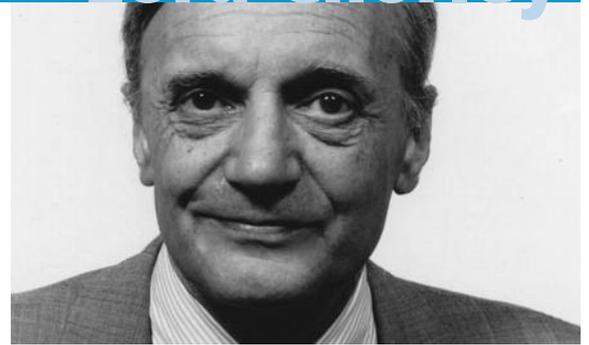
Contributions Here my aim is to describe Lord Chorley's very substantial contributions to environmental causes (he was Chairman of the National Trust), Geographical Information Science and Systems and the Royal Geographical Society (RGS with IBG).

Roger was quintessentially a 'man of the hills'. In his twenties he was a keen and highly successful mountaineer climbing in the Alps, the Karakoram and elsewhere. One of his colleagues was **George Band**, the youngest man on the successful Everest expedition; he and Roger made some significant first ascents and the latter was also destined for mountaineering stardom until he contracted polio. That restricted his climbing but he maintained a life-long love of the hills (especially in his beloved Lake District) plus the natural environment in general and was much involved in the Alpine Club (as President), the Mount Everest Foundation and related bodies, notably the RGS (where he met his wife Ann).

Concluding a decade of being on RGS Council, Roger was the Society's President from 1987 to 1990. Unsurprisingly, his strategic and analytical skills and enthusiasm for geography played a major role in re-shaping our Society. He initiated and led the Forward Look strategic review – arguably the first of its kind. This led to the creation of successful regional arms, fund-raising and the early stages of what became the merger between the RGS and the IBG. His Presidential Address of 1990, entitled 'Blueprint for the Future', argued that the Society should promote a greater understanding of the environment and the interactions of human factors with it – in short to become a Chatham House for Geography. In the subsequent 16 years this is exactly what was achieved.

Nowhere did Roger's interests, passions and skills come together more appositely than in the embryonic stages of what became known as Geographical Information Science and Systems (GIS for short). From little more than a dream in the 1960s this has become a multi-billion pound global industry which now touches all our lives. Driven by new technologies and commercial opportunities, the field expanded rapidly. 'Brits' played a key role. **David Bickmore** was a charismatic innovator in automated cartography, **Terry Coppock** a pioneering academic in exploiting the new tools and **Roger Tomlinson** was the founder of the first major operational GIS. But Roger Chorley was the visionary who steered the development of public institutions, governmental and public attitudes towards GIS, creating an environment which enabled those in the field to flourish, encouraging Ordnance Survey to embark on the world's first creation of a national digital map framework and, in the process, re-shaping the very nature of Geography as it is now taught in the USA

Roger Chorley, mountaineer, environmentalist, geographer... and GIS pioneer.



and elsewhere as well as the UK.

Three interlinked triggers, all involving Roger, shaped this revolution. The first was government's Ordnance Survey Review Committee of 1978/79 of which Roger was an influential and forensic member. It reviewed the performance of OS and options for the future, including one section (of 10) on the potential benefits of converting all the quarter million of OS topographic maps into computer form. Fired by this and the rapid developments in satellite-based earth observation, the House of Lords Select Committee on Science and Technology held an enquiry into satellite remote sensing and digital mapping. Chaired by **Lord Shackleton** (another RGS President), Roger and its other members recognised the potential benefits of integrating data from many sources to reduce duplication of effort and extend the range of applications of geographic information. In 1984 they proposed that government should set up an official committee under Roger's chairmanship "to advise the Secretary of State for the Environment...on the future handling of geographic information in the UK, taking account of modern developments in IT and of market needs". Government accepted the recommendation.

The Chorley Report was submitted in March 1987. Roger ensured that Committee members came from a wide range of backgrounds – business, including the SME community, professions, local authorities and academia. It received evidence from 400 organisations or individuals. The Report proved revolutionary, anticipating the expanded role of the private sector plus the added value from bringing together different datasets for the same area. It recognised the difficulty of knowing which bodies held which data, the problems from data 'locked up in paper maps' and the need for more education courses. Sixty five actions were proposed and many were enacted to address the issues. One tangible result was the creation of the UK Association for Geographic Information: in 1997 it described Roger's report as "inspiring, visionary, accurate... and timeless".

Roger Chorley was a wonderful colleague, friend and mentor. As described above, he helped shape many worlds. The Geography and environmental communities in particular have much cause to thank him."

David Rhind, April 2016



The Report proved revolutionary, anticipating the expanded role of the private sector plus the added value from bringing together different datasets for the same area.



AGI: council members explain



GiSPro talks to:

THE ASSOCIATION FOR GEOGRAPHIC INFORMATION

GISPRO EDITOR STEPHEN BOOTH met with **David Henderson** (chair), **Graham Wallace** (vice-chair), **Abigail Page** (honorary secretary) and input from **Andy Wells** (honorary treasurer) ahead of this year's ESRI UK conference to better understand the changes, the difficult decisions behind them and the future for AGI. Council Chair David Henderson regards the changes as a progressive repurposing of the core functions of the organisation rather than a cost-cutting exercise. We are in an age when the

a restructuring of our current membership model is almost certainly required. We are of course a membership organisation and supporting our members is our core activity. Whilst it's reasonable to observe that we need some degree of administrative support, there are different, more cost-efficient, ways to achieve this – a fulltime staffed office in central London is well beyond what is required for the administration of AGI."

"We are acutely conscious that we need to be talking to members but as yet that is difficult because we are only half way through considering a number of different scenarios and identifying activities required. The AGI has strong reserves and following recent changes is now in a position where current income generation is expected to cover our annual costs. We are working on opportunities to streamline and automate many of our processes, such as membership renewals. Future activities currently being considered include webinars,

"Our mission is quite unique and our work is far from done!" Recent changes in staffing and direction have been announced by the Association for Geographic Information. After a long haul and some tough decisions – the AGI looks set to embark in a new direction. *GiSPro* recently caught up with key members of the Council to talk to them about the changes and the future for the organisation.

mission remains relevant but the audience has changed, says Graham Wallace. It is a necessary transition at a time when the market has evolved and the organisation needs to evolve with it. For members, they should be reassured that the Council believe these difficult decisions are the best chance of preserving a strong AGI. So what's behind the changes and what are the plans for the future?

roundtables and events which follow the format of the recent regional conferences run by Scotland and Northern Ireland – which proved to be popular and cost effective to run – benefitting from strong support from our supporters and volunteers."

Abigail Page adds that too much valuable resource has been spent on administering membership and therefore AGI was not able to put resource behind those activities which add value to membership. It has been the volunteer led activities which add greatest value, she argues. Graham Wallace comments that "what we have is a rebalancing so we can focus all of our resources so we can provide value for money to members."

Graham Wallace adds that "in our role as directors of AGI it is beholden to us to look at how we can manage things more cost effectively and make the membership pound go further through streamlining the service."

Q: At last year's AGM, Council shared a relatively positive financial position with the membership yet has chosen to close the AGI office in London. Can you shed greater light on the need to do this?

David Henderson: "Just as the digital industries in which we are immersed are changing how they deliver to customers, AGI is looking at smarter ways to support our members in a more cost-effective way, releasing resources so that we have the option in future to invest in new initiatives."

"Council took the difficult decision to close the AGI office and to significantly reduce the size of the AGI team from the start of April 2016. Whilst AGI continues to maintain healthy reserves, like many similarly sized membership organisations, the Council recognises the need to plan for a sustainable future whereby membership fees and events are not relied upon to cover the organisation's costs; indeed

Q: With a significantly reduced team do you really believe that AGI will continue to be able to deliver its mission by relying more heavily on volunteer resources?

David Henderson: "It is notable that over the last few years AGI's most progressive activities have been delivered by a core of committed volunteers realising



... too much valuable resource has been spent on administering membership... AGI was not able to put resource behind those activities which add value to membership.



AGI: council members explain

a new wave of exceptional member value – the development of the Geo:Big 5 event series and associated thought leadership; the subsequent compilation and publishing of the AGI Foresight report at the end of 2015; and the continued development of our Early Careers Network, which is now attracting international interest. However, the delivery of these have relied too heavily on a core of committed volunteers. By taking a new focused approach, with the benefit of a lean operating model, we feel that we will be in a better position to deliver the mission.”

“We continue to retain important contracted support to assist with the management of our finances and our marketing and communications. It is essential that any future appointments are additive to the strength of our volunteer base and can help progress our mission.”

Q: Okay, do we really have enough volunteers to set up events, manage them and deliver them on the day or will you outsource the work?

Abigail Page: “We will always need some degree of support for our activities. While we hope to see members continuing to lead initiatives and activities, they need to be appropriately supported. A more flexible model for administrative support will allow us to have the right skills available at the right time, without the overhead of a fulltime office.”

“It’s also worth noting here that AGI is much more than events. Whilst events are a good way to share insights, develop consensus, build networks and celebrate successes – it is not necessary for AGI to only run events on our own to achieve these outcomes. The running of events cannot and should not be run to the detriment of other activities undertaken by AGI. The success of our 2016 events thus far are evidence of our ability to maintain high quality events under a very different model.”

“There are a broad range of other activities that exist today and in which our members are able to participate. Whether that’s in our National and Regional Groups, meeting with like-minded colleagues in our active Special Interest Groups or using our social media channels to encourage discussion and debate on key topics of interest – there’s lots of ways to contribute.”

Q: How will the website be maintained? How will the important day-to-day management of subscriptions and membership work? Will there continue to be a phone number that members (and importantly prospective members) can call?

Abigail Page: “Arrangements have been made to ensure that we continue to provide members with appropriate levels of support with respect to administration of membership, finance, marketing



and communications. From the start of April, we have had a fulltime reception service to answer members’ calls and emails. A service desk system is ensuring that all enquiries are dealt with and that we continue to support our members on a day-to-day basis. In this transition period there is a reliance on a core resource that has been provided voluntarily by members of AGI Council and over the coming months we will transition to a more permanent arrangement.”

“Our website is maintained by a number of web authors and supported under contract. Along with recent investments in CRM, our website is a key point of access for prospective new members. We are also in the process of moving the organisation’s IT systems to the cloud, which will give greater flexibility and present less of an overhead.”

Graham Wallace adds that two years ago a lot of effort was put into improving the website (mainly by Abigail Page) to make the navigation easier so that members can self-serve. Abigail adds that the new service desk service distributes queries to mainly council members, which has given them an insight into the sort of issues and problems that come from the membership such as CPD, a key issue for members.

Q: Can you explain within the context of the changes whether there will be an annual conference this year and if there is, how you will manage it without the fulltime support of a secretariat?

David Henderson: “I’m really glad you’ve given us the opportunity to talk about events! Over the last few years we’ve continued to run an annual conference; and in 2014 and 2015 our Geo:Big 5 event series opened a new dialogue with organisations and partners who typically sit outside of the geospatial industry. Those who participated found them to be a resounding success and of course these events acted as an invaluable input to the 2015 Foresight Report.”

“From 2016 we are looking to run events in a different way – with a greater focus on providing a platform for sharing insights, networking and thought leadership. In recent times the cost base of our events has necessitated a greater focus on sponsorship which has, at times, distracted from what the focus of our events should be about!”

“We have already had some fantastic events during 2016 with those in Scotland and Northern

Future events are likely to look significantly different to previous years.



...we are looking to run events in a different way – with a greater focus on providing a platform for sharing insights, networking and thought leadership.



AGI: council members explain

Ireland seeing a record attendance and a high level of engagement with new attendees. Both events have been the subject of significant social media attention and continue to play an important part of the national GIS agendas of Scotland and Northern Ireland. We also know that AGI Cymru along with many of our special interest groups and regional groups across England are making plans to ensure that networking and knowledge exchange continues to be at the centre of their activities."

"In terms of 'big shows', AGI is delighted to continue to partner with RICS, TSA and ICES and the team behind GeoBusiness, which brought together several parts of the wider geospatial and geomatics industries for two days in May. A decision on whether AGI runs a UK-wide event later in the year is still being considered – however, if it is run, it is likely to look significantly different to previous years. GeoCommunity has been a fantastic event for members, however increasingly our members have found it difficult to attend a two-day residential event and any future such event will necessarily have to be built around a different sponsorship model. We will continue the success of the AGI Awards and this currently presents the most likely focal point to bring members together at the end of the year. We'd be delighted to hear from members and / or sponsors who would like to be involved."

Henderson adds that AGI has an active, excited and motivated group around early career development, CPD and special interest groups, while older members tend to the view that, well it's done what it was set up to do. The focus therefore has to be on that former group for the future. "We learnt a lot from the Big 5 events in 2014 and 2015 which attracted people who were traditionally viewed as from outside our industry."

Abigail Page argues that it was important for the GI membership where that "siloes" people need to be more aware of initiatives like Future Cities and BIM, otherwise they could be left behind. "So it was about moving our membership on" she concludes.

Graham Wallace adds that the market has changed from GIS being a specialism to something with a much wider footprint: the reach is no longer the GI specialist. It extends to people working in analytics, Big Data and those involved in business processes within organisations. With that has come engagement with organisations like RICS, Institution of Civil Engineers and others in the BIM sector.

Q: So can we say that these changes are down to the growing maturity of GIS?

David Henderson: "Yes I would say that. I would refute any notion that AGI has completed what it set out to do. The mission continues to evolve. From twenty years ago when we didn't have Google maps, the Cloud, the Internet of Things, if we looked at

where we are today and ask does this look like success, I think we would rightly consider ourselves to be very proud of our achievements! We are now way beyond mapping and the early advent of GIS. Geospatial is effectively mainstream and our message is no longer an explicit one but an implicit one. GI is part of the solution so we have to work in partnership with other organisations."

Graham Wallace adds that last year's Foresight Report highlighted where the footprint of GI had moved to. It found that the nature of GI skills was changing so that it was no longer about the geeky running of computer systems; it's about how data is assembled, how it can be put together from the web. So the aim is to re-position what skills people are going to need to survive over the next twenty or so years.

Q. Okay, so does the Council as presently constituted have enough skills and resources to manage this?

Well it's not just the Council, says David Henderson. We have active national and regional groups. The Early Careers Network is coordinated by Andy Murdoch, Special Interest Groups are generally run by non Council members and we call upon an invisible but active volunteer membership that we often don't give enough credit to, just as the membership at large probably don't realise the amount of effort that Council puts in. We want to get the AGI back to where the Council provides strategic support and guidance to the business rather than propping up operational activities. These are an interim measures while we transition from one model to another.

Graham Wallace adds that there are some discussion groups which have been looking at various scenarios and costing them up based on the operational restraints and resources. Membership too has made suggestions. "The change in the operational model will enable us to engage with sponsors on a different level" he observes.

Q: Where does the Council envisage that future growth will come from? Are members going to see a major recruitment drive?

Andy Wells (Honorary Treasurer): The environment in which we work is changing rapidly and the need to balance membership cost with benefit is coming into ever sharper focus. We only have to look to the government funding situation to see this. However, from the two events run this year and the feedback from the Foresight report, it is clear there is an appetite if we get the balance right. If we had stayed with the current model, we had little flexibility. With the new membership cost model and the events approach, we will have this. Therefore, we believe we are in a better position to provide an offering that will halt the decline in membership and start to see new entrants as well as some lapsed members returning.



... the market has changed from GIS being a specialism to something with a much wider footprint: the reach is no longer the GI specialist.



AGI: council members explain

Q: What are the prospects for merging with a larger organisation like the RGS or RICS?

Graham Wallace: "AGI is a relatively small association, but with big ambition. As members we've traditionally punched well above our weight in terms of voice and reach. Our members believe that geographic information has an important role in the digital market. Whilst it is true that GI has become far more implicit in the digital society, where the value of location has become ubiquitous with day-to-day decisions, it is also true that location offers a degree of structure and analytical value that is still under-appreciated in big data analytics and the development of the increasingly smart societies in which we aspire to live, work and play. Our mission is quite unique and our work is far from done!"

David Henderson adds, "In today's global society no single organisation will win on their own. Partnerships, collaborations and closer working between like-minded individuals and organisations are key to future success. Where there are opportunities for our mission to be delivered with others we will increasingly seek opportunities to do so, both informally and more formally if this is appropriate. At this time, there are no current discussions with external bodies on anything further than encouraging greater strategic alignment between respective organisations' missions and activities."

Q: What are the views of the major sponsors of AGI about the changes, like Esri and OSGB?

David Henderson: "The views of all of our members, be those individual or organisational, are important. Our membership model has traditionally relied on support from a small group of sponsor members from across large government departments and commercial vendors who value the networking we can offer. While continuing to want to collaborate with AGI, these members are increasingly looking for different things and wherever we can we will continue to work with them to ensure a two-way exchange of mutual value. We continue to benefit from strong representation on the AGI Council from many of these members and their views continue to be fed into our restructuring plans."

Abigail Page adds that new members are attracted by what AGI is doing through specific activities. Sponsor support likewise will be attracted by these activities rather than simply sponsoring the organisation.

Q: So who leads the AGI and what might we expect for the remainder of the year? Does it want to get back to where the organisation has a leader, a CEO?

We will continue to be membership led. Without the passion of commitment of our members, there is no



long-term sustainable value in AGI. At the AGM last year, we challenged all our members not to ask "what AGI is doing for me?" but rather to consider "what might I do to support the mission of AGI?". Since then we've been really encouraged by the number of new members contributing - not least those coming together to collaborate on a range of activities like our Early Career Network, across our National and Regional Groups or Special Interest Groups. We can't stress the importance of this active participation strongly enough. AGI's lifeblood is the activity undertaken by the membership and this strong commitment to be an organisation underpinned by active members continues to be a strength we celebrate.

Council will be focused on the following priorities for the remainder of 2016:

1. Complete the restructuring of AGI operations – ensuring that we meet the needs of our members in a more sustainable, yet cost efficient manner.
2. Review our membership model and trading status so as to ensure we are attractive to join, easy to engage and fleet of foot in meeting the needs of our members, sponsors and collaborators.
3. Develop a stronger voice for the role of geospatial as a positive agent for change during the significant period of environmental challenge that we are facing – be that social, economic, political or technological. There are greater opportunities for geospatial to make a difference in 2016 than at any time in our history – AGI Council are committed to ensuring that the great foresight captured in our report published last year is given greater exposure.
4. Celebrate the most progressive applications of GI and geospatial technologies at our Awards event in November and look to wrap a new style conference around this annual event

On the question of a CEO Wallace says it's definitely one of the options that's in the mix while Henderson adds that it's difficult to see how they can advance AGI without someone in that ambassadorial role.

• GISPro appreciates the candidness of Council members. Watch this space for more on how AGI intends to move forward in these challenging times.

AGI Awards presents the most likely focal point to bring members together.



Partnerships, collaborations and closer working between like-minded individuals and organisations are key to future success.



Geovation 2016



Above: Lost in thought at the Geovation Hub.

EARLY APRIL PROVIDED AN OPPORTUNITY for six young entrepreneurial start-ups to show potential financial backers their latest projects. They were looking to interest and excite the audience to reach for their wallets for seed funding and production capital.

Hosted by Ordnance Survey's Geovation Data Lab in the city, the evening was kicked off by OS CEO **Nigel Clifford**. Geovation now has nearly 500 members and backing from 80 companies. Apparently it was about "geography used in interesting ways".

The first project, Ment.at was about machine learning so that a drone could safely negotiate a complex route and perform a routine task. First you have to teach the vehicle's software what is "normal" and about collision avoidance. I was intrigued by the presenter's example of how this might be applied. He mentioned an autonomous inspection by a drone of a windfarm in the middle of the Atlantic. I couldn't help thinking the drone bit was just a small part of the technical challenges involved here.

by young men on other young men. Also, there's too much evidence of attacks in well populated places where people do nothing to intervene when an attack takes place. And it's nothing new. In New York in 1964 some thirty or so bystanders did nothing whilst a man raped and stabbed a woman to death.

Land management According to **Tim Hopkin**, England has 120,000 farms occupying 60% of the land mass. Yet farmers and estate managers are poorly served by IT. Tim is therefore developing the Land App, a software as a service (SaaS) solution so users can get or log data in one place as well as helping design new schemes of land management. With an API that will be open for online collaboration, already several major land managers have expressed interest including the Crown Estates and estate agents Savills.

Springtime for Geovation

The Geovation Hub located in the City of London is Ordnance Survey's contribution to encouraging location-based business start-ups. *GiSPro* was invited to the Hub's Spring Showcase.

Aerial mapping by drone Each presentation was introduced by a major sponsor of the Geovation centre. **James Prayne** of DSTL (Defence Science and Technology Laboratory) introduced PodCloud from Insight Imaging, a 'close-quarter aerial mapping system for drones'. Presenter **Anthony Ashton** was "passionate about drones" with early experiments in homemade ones before they became available cheaply from Maplins. Hours of painstaking work assembling the device then a trip to the local park for the first test flight. . . and crash! I recall it was a bit like this for the Wright Brothers. . .

The aim of the project is to create a >1kg pod for the drone that includes a web interface for aerial data processed entirely in the cloud. Integration with air traffic control is planned and the speaker argued that registration of all drones cannot be far off. With several major clients already, including Yorkshire Water, PodCloud is currently looking for £80k seed funding and a further £200k to get into production next year.

Late night safety Apparently 28% of women report feeling unsafe at night in London, despite a big increase in night buses and the impending all-night tube. Help is on the way. **Anta Zeitlin** has a very laudable plan to make late night journeys for women much safer. Her Nightmap, inspired by a dodgy Google mapped journey in a foreign city, aims to use standard mapping overlain with information about street lighting, shops, pubs and restaurants that stay open late and thereby provide reassurance to the lone walker. There are plans to include a facility to log-in/out at the start and end of a journey.

I can't help feeling much of this feeling unsafe is misplaced. Attacks are rare and more often than not

Forecasting capacity in transport networks Smart transport networks should be part of the smart cities initiative. Forecasting capacity based on travellers entering the network, awareness of events and using sensors in the system to detect progress are all essential if commuters' experience is to be improved and maximum benefit is obtained. Open Capacity aims to deliver real-time forecasting of capacity based on data from ticketing to onboard sensors in carriages. CEO of Open capacity **Gerrit Boehm** needs backing for live trials and has already attracted interest from two rail operators.

A channel for data Do we need one single point for all data about an enterprise or organisation? **Tom Rees**, CEO of Datapress thinks so. After a shaky start to his presentation (why did I feel a sense of schadenfreude when his Apple Macbook failed repeatedly to boot until an audience member lent a charger?). Rees describes his venture as 'like a Youtube channel for data' with a vision that one day it will include social data. With currently around 50 updates a day, an early user of it is the Greater London Authority which now has nearly 1000 datasets up there. To take the project further Rees needs £800k - £1.2m funding.

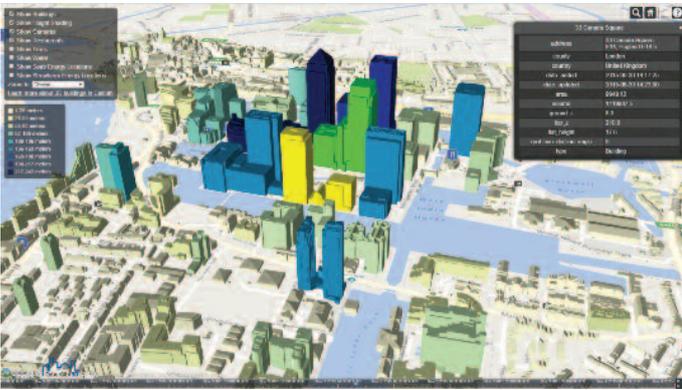
Listening to these enthusiastic youngsters who'd clearly devoted a lot of time to developing their project to the point that it was almost ready for launch, I couldn't help thinking they were not well served by an over warm room, a lack of a decent p/a system and, at times, poor preparation of presentations. As this event was supposed to be about pitching to potential backers it was an important opportunity that was not always exploited to maximum benefit.



. . . **Nightmap, inspired by a dodgy Google mapped journey in a foreign city, aims to use standard mapping overlain with information about street lighting, shops, pubs and restaurants that stay open late. . .**



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CartoConsult, provider of smart 3D building and city models, can now deliver 3D city and building models on subscription via the web. With live web streaming, CyberCity 3D models can be instantly viewed anywhere, anytime on tablets, smartphones, interactive screens and PCs. Using Cesiumjs open architecture, a cross-platform virtual globe designed for dynamic-data visualisation, can significantly boost the appeal of applying 3D capability to projects. The data is still fully compatible with GIS, CAD and other mapping software with 3D capabilities, but it is no longer a requirement for viewing the data.

Tim Hughes, MD of CartoConsult 3D adds "Cesiumjs is the best platform for visualising spatial data on the web with high quality graphics and an easy, interactive user interface that is ideal for viewing our 3D smart city and building models. It offers lightweight, open architecture that can be deployed across multiple device types, including tablets, smartphones, interactive screens and of course the traditional desktop. It also works as a 'behind the firewall' application for defence or security conscious clients."

Postcode-level UK windstorm peril model

Data services provider emapsite has launched a postcode-based perils model enabling insurers and underwriters to assess the windstorm risk to properties in the UK. The data is available as a discrete dataset and through an on-demand data-hub location content platform.

The Met Office's **Nick Moody** believes that windstorm is potentially the most costly natural peril in the UK. "Our high resolution hazard maps are based on a detailed 35-year reanalysis dataset of extreme gust values, giving a robust view of location and severity for the most commonly researched return periods."

The perils model provides a detailed perspective into the distribution of risk based on Met Office data tracking the most

extreme winds. Created through close liaison with insurance sector clients, it provides postcode-sector level granularity along with detailed risk scoring.

No-fly zones for drones

The latest version of Europa Technologies' global map data products includes layers which can assist in the creation of no-fly zones for unmanned aerial vehicles (UAVs). A recent aircraft-drone collision in which a British Airways A320 aircraft was struck by a drone during its approach into London Heathrow airport highlights the problem.

Many media reports have referred to on-board "geofencing" which is the concept of using GPS (or other positioning technologies) with a reference database of explicit areas which are inclusion or exclusion zones.

Should a geofence rule be broken, an action can be taken. In the case of a drone, take-off could be blocked or onward movement restricted. Some makers of popular UAVs, such as Chinese manufacturer DJI, include geofencing in their products as standard.

In addition to an extensive database of airports worldwide, Europa Technologies' Global Insight Plus and Global Discovery data products include a new airport areas layer. Captured from satellite imagery, the data outlines the operational area of over 3000 international and domestic airports worldwide, which can be used to build buffered no-fly zones. Europa Technologies' **Warren Vick** comments, "With the FAA predicting that there will be over 7 million small drones in US airspace by 2020, it is critical for the future of the industry that mandatory safety controls, including geofencing, are universally implemented."

Support for latest OpenData products and MasterMap styling

British GIS software developer Cadcorp has provided software support for three free-to-use data products from Ordnance Survey. Support for OS Open Map - Local; OS Open Roads; and OS Open Rivers was added in a recent service release of the Cadcorp Spatial Information System (SIS) software suite. The three vector-based datasets provide a nationally-consistent and high-level cartographic view of buildings, road networks and rivers and waterways throughout Great Britain.

According to the Ordnance Survey, OS Open Map - Local provides the most detailed level of buildings in the OS OpenData suite. OS Open Roads is a connected road network, and contains all classified roads (such

as motorways and A & B roads) as well as officially named unclassified roads. OS Open Rivers is a generalised open water network showing the flow and the locations of rivers, streams, lakes and canals. The three products have been designed to be used together.

OS OpenData products are free to view or download for both personal and commercial applications and are used by many Cadcorp customers to provide a background against which to view identifiable features in the landscape for their own business data. This opens up extensive possibilities for the users, allowing for example, Cadcorp's Map Modeller software to run network analyses on the Open Roads data. Users of Cadcorp's free desktop product, Map Express, can access all of the OS OpenData, change the style of the OS maps, determine which types of features to display or highlight, perform spatial and attribute queries, and undertake thematic mapping.

Cadcorp's **Martin McGarry**, underlined the significance of supporting these free mapping products. "Many of our customers... depend on mapping from our national mapping agency... Cadcorp is an active member of the OS Insight programme and as such has early access to new product developments at the OS. We have used this position to make it as easy as possible for our customers to read OS data formats and to import this data into Cadcorp SIS."

The new service release also includes support for OS MasterMap Topographic Layer V9 Schema, providing 76 new descriptive term attributes. Meanwhile, a new version of Map Express which supports the three Open Data products and the new Topographic Layer V9 Schema, can be downloaded from the Cadcorp website at <http://www.cadcorp.com>

| seminars | conferences | exhibitions | courses | events | workshops | symposiums |

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.

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Esri User Conference 2016
27th June - 1st July 2016, California, USA
www.esri.com/events/user-conference

JULY 2016

ISPRS
12-19th July 2016, Prague, Czech Republic
www.isprs2016-prague.com/

SEPTEMBER 2016

BCS - SoC Conference 2016
6-8th September 2016, Cheltenham, UK
www.cartography.org.uk/default.asp?contentID=581

OCTOBER 2016

GeoDATA Showcase 2016 Scotland
6th October 2016, Assembly Rooms, Edinburgh, Scotland
www.geoaware.info/#!geodata-seminars/c23xn

OCTOBER 2016

Intergeo 2016
11-13th October 2016, Hamburg, Germany
www.intergeo.de/intergeo-en/index.php

GeoDATA 2016 Brussels
19th October 2016, Brussels, Belgium
www.geoaware.info/#!geodata-seminars/c23xn

The Commercial UAV Show 2016
19-20th October 2016, London, UK
www.terrapinn.com/exhibition/the-commercial-uav-show/index.stm

NOVEMBER 2016

Trimble Dimensions 2016 User Conference
7-9th November 2016, The Venetian, Las Vegas, USA
www.trimbledimensions.com/

GSDI 15 Conference 2016
28 November-2nd December 2016, Taipei City, Taiwan
<http://gsdi15.org.tw/>

AGI Foresight Report 2020



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The AGI Foresight Report 2020 gives insight into the issues we believe will have a significant impact on our economy, environment and society over the next five years. The purpose of the Report is to both observe and challenge the current role of Geographic Information (GI) in relation to these issues.

The Report highlights five key themes that are of relevance, not only to the GI industry, but to anyone with a vested interest in how technology and information will change our world and businesses in the next five years. These five themes - Open, Big Data, BIM and Future Cities, Innovative Technologies and Policy - form the backbone of our Report, bringing together papers from experts across industries and disciplines.

They show that the GI community can, and must, play a big part in helping us to understand and maximise benefits from these areas, and meet head on the challenges and opportunities the next five years will bring.

Many thanks to our sponsors of the Report:

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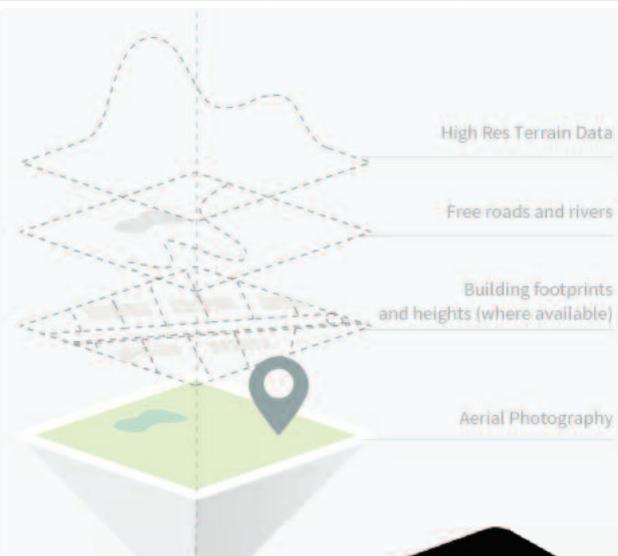
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