a K2 Advisory study

Understanding the future of GIS usage in the UK public sector

Authors: Dr Katy Ring - Director, K2 Advisory

Kate Hanaghan - Research Manager, K2 Advisory

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K2 Advisory
6th Floor, Bridge House
48-52 Baldwin Street
Bristol BS1 1QB
United Kingdom

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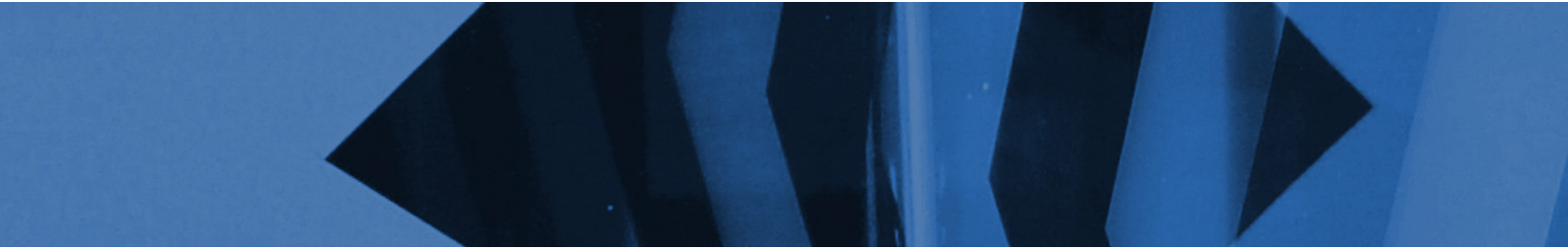


1 Market overview

1.1 Introduction

K2 Advisory was commissioned by Pitney Bowes Business Insight (PBBI) to conduct research to assess the current and planned use of Geographic Information Systems (GIS) within UK local authorities The findings in this report are based upon survey responses and interviews conducted by K2 Advisory analysts in May and June 2010 with 100 GIS practitioners working for local authority organisations in the UK.

K2 Advisory works with a very powerful network of top-level decision-makers in end user organisations. The K2 Advisory approach to analysis is underpinned by its links into the professional communities run by parent company, Sift Media. This ecosystem of professionals and senior executives provides us with unrivalled connections to CFOs, Finance Directors, HR Directors, Procurement Officers and other Public Sector technology buyers – alongside the K2 network of CIOs.

1.2 Market overview

The UK Government today is facing many challenges as it operates with a large national budget deficit, fluctuating population movement, as well as terrorist threats and security concerns. In the meantime local authorities must continue to provide and manage local infrastructure to attract, retain and support local businesses for job creation and to strengthen the local tax base, as well as continue to improve local public service provision.

In this context Geographic Information Systems (GIS) have a pivotal role to play in supporting many of the requirements of local authorities such as:

- planning, development and management of local authority assets
- ability to provide security for those assets
- enhanced capability in areas such as disaster forecasting, pandemics and emergency preparedness and recovery operations
- enabling lower cost citizen-centric self-service solutions

1.3 Democratisation of data

The world of local authority geospatial data management has, until quite recently, been the preserve of back office specialists as mapping data has largely been accessed for internal use by departments managing housing and highways and liaising with utilities and emergency services. Now, along with the rest of the world of data, web-based delivery and consumer expectations are combining to shift geospatial/mapping systems towards citizen access.

Indeed, the topicality of GIS as a key component in such citizen-facing initiatives is reflected by the fact that 44% of participants in the research have recently been involved with projects to provide the public with access to geospatial/mapping data that was previously only for internal use.

The consumerisation of access to mapping data is being driven by Google, Microsoft, Twitter et al as the use of maps becomes a common part of applications, providing the “where” factor for everything from reporting the location of a broken street lamp, to the ability to find the nearest swimming pool. Furthermore, this is becoming a far more powerful trend with the increased usage of mobile 3G phones leading to the ability of the citizen to interact with local authorities, “anytime, anyplace, anywhere”.

For local authorities this poses some challenging questions about what data to provide for public consumption and what legal liability they might have for the accuracy and integrity of data provided to the public. When it comes to mapping systems, some of these issues are resolved by reusing Ordnance Survey data, which is now becoming freely available.

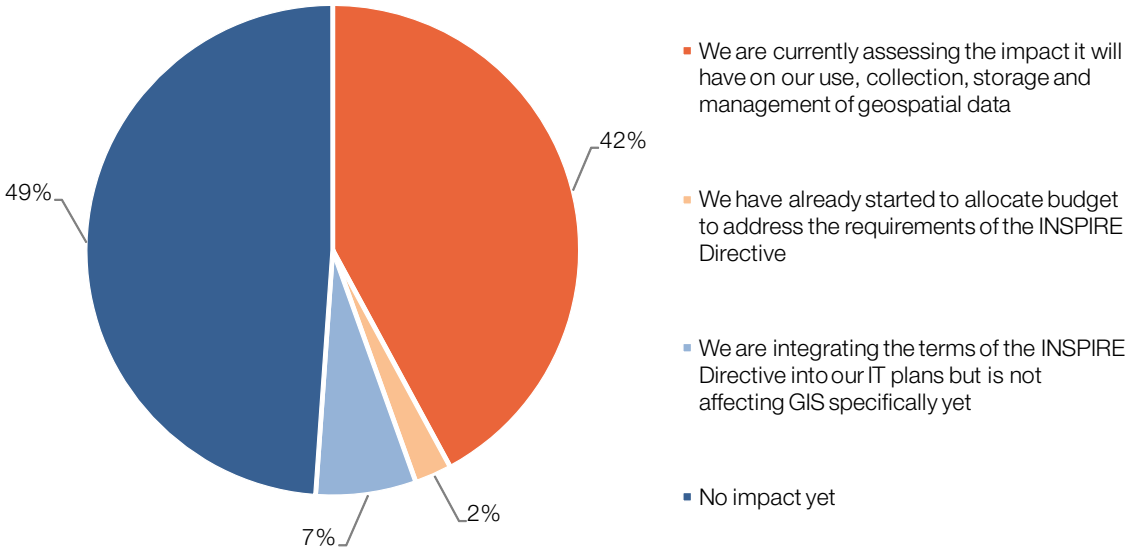
1.4 EU INSPIRE not inspiring much activity yet in the UK

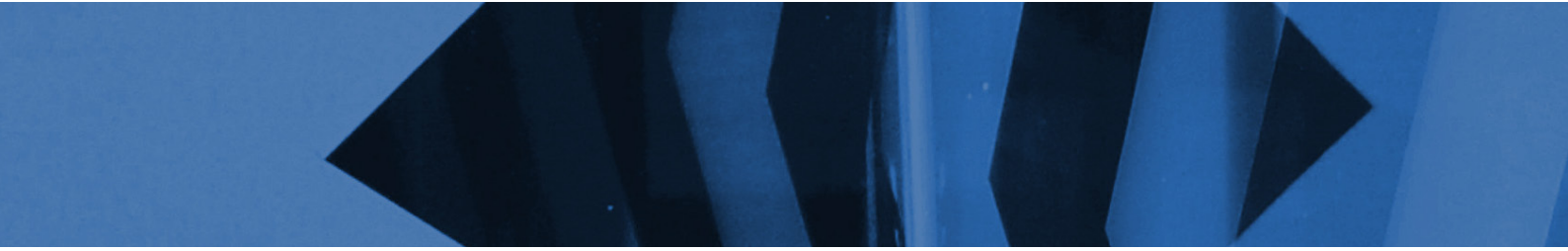
The empowerment of organisations and individuals by providing greater access to a broader range of geographic and location-based data has now also moved into regulatory requirements for the public sector. For example, the EU INSPIRE directive, which came into force in May 2007 with an expectation of full implementation by 2019, aims to create a European Union (EU) spatial data infrastructure. This will enable the sharing of environmental spatial information among public sector organisations and better facilitate public access to spatial information across Europe. The main point of this is to support cross-boundary policy-making and to avoid the cost of duplicated collection, management and storage of spatial data. Despite the fact that the directive was approved two years ago, its phased roll-out over the next decade or so has meant that it is generally a slow-burner within IT departments.

In this survey, 49% of GIS professionals say that the INSPIRE Directive is not yet having an impact on budgeting and planning, while 42% are currently assessing the impact the directive will have on the use, collection, storage and management of geospatial data. As shown in Fig. 1, only 9% in total have moved beyond the assessment stage.

Fig 1 – Impact of the INSPIRE Directive on budgeting and planning

Survey question: "What impact is the EU INSPIRE Directive having on your budgeting and planning? Please select the statement that is most in line with your experience."





1.5 Key trends

During the next two to three years we expect the following trends to become clear, driven by both increased use of cloud computing on the one hand, and availability of lower cost mapping data on the other:

- GIS will become a de-mystified area, because it is being pulled from the back offices of local authority organisations, used primarily by internal departments, into the world of consumer and citizen requirements to get “where factor” data either on the web from static PCs, or, increasingly, to 3G phones while on the move.
- With increased integration of GIS into address databases and CRM systems, both internal departments and citizen-facing employees will be able to work more efficiently because of the development of a single view of each citizen.
- GIS will enable local authorities to provide higher value services that are more dynamic and real-time in terms of response, indeed some such as Warwickshire with its “myWarwickshire” iPhone application are already highlighting the possibilities of what can currently be achieved in this area.

2 Key findings from the research

2.1 Key findings

- Within the past six months, 44% of local authorities have been involved with projects to provide the public with access to geospatial/mapping data, which was previously only for internal use. And, over the coming six months, around three-quarters (73%) of local authorities expect to provide more location-based services to the public.
- Increased sharing of data with subcontractors creates faster and more accurate decision-making: Transport, traffic & highways management is the area where the increase in the use of geospatial data in order to inform better decision-making is the greatest. The second highest increase in the use of geospatial data to enable better decision-making is in emergency planning.
- 71% of local authorities do not currently provide mobile GIS services and/or applications and, at the moment, 81% of Local Authorities do not provide location-aware services and/or applications (in other words, where knowing the real-time location of a user or citizen can be used in the provision of a service). There are clear benefits in giving staff access to mobile GIS and enabling the public to have geospatial data 'on the move' – however the majority of councils are not yet able to enjoy those.
- 47% of local authorities have integrated GIS with other core business applications (such as CRM and ERP), enabling improved data sharing that can allow for more informed decision-making and more efficient service provision.

2.2 Greater sharing of location data

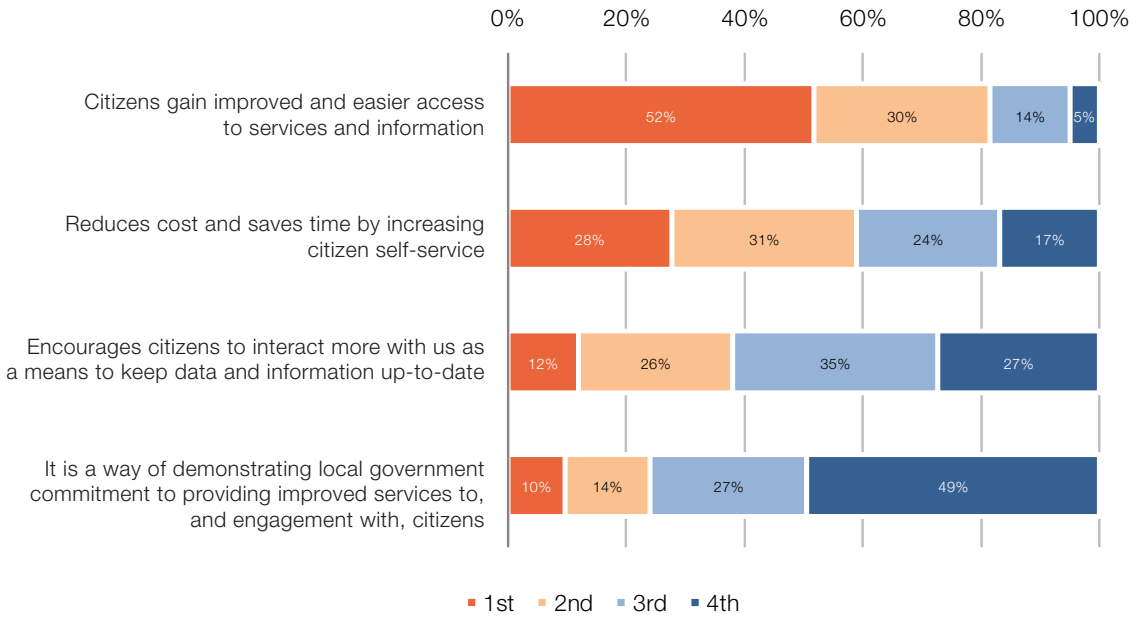
Sharing data with citizens

The democratisation of data is an unstoppable trend that not only has the potential to improve the way local authorities (LAs) use and share information, but ultimately the rights and lives of citizens. K2 Advisory's research shows that there is an imperative right now within LAs to share more mapping information - not only with other organisations (such as utilities companies) but also with the general public. In the last six months alone, 44% of local authorities have been carrying out such activities, and we know that more have been doing so over a longer period of time.

There is a very clear signal from GIS practitioners that the greatest benefit of providing citizens with increased access to geospatial/mapping data is that it gives them easier access to services and relevant information (see Fig. 2 below). Another important benefit of providing this information to the public is that it enables them to "self-service" – thus removing some of the considerable strain on front line staff tasked with answering queries from the public.

Fig 2 – Most important benefits of public access to GIS data

Survey question: "With regards to the key benefits of providing citizens with increased access to geospatial/ mapping data (via website information services, for example), please rank the following according to their importance to you, 1st being most important, 4th being least important:"



A common use of mapping information is to provide a web mapping portal to the general public that displays service-based data and uses a "Where's my nearest…?" style of tools. As a result, there are numerous excellent examples across council websites – for example, Waltham Forest, which gives map-based information on everything from marriage venues to allotments and road works.

- My Place in Waltham Forest website:

  http://myplace.walthamforest.gov.uk/#h:map-tab

Furthermore, this type of service can, if presented in a way that is compelling, encourage greater interaction between the council and members of the public. For example, on Harrow's website, one might only be looking for information on bin collection days in your street, but one will also find information detailing the members of your local "Safer Neighbourhood" team at the Met Police, for example. The browsing experience of the web gives that power.

- MyHarrow website:

  http://www.harrow.gov.uk/site/custom_scripts/php/myharrow/myharrow.php

K2 Advisory believes this concept could be taken further. Within this online environment, there is the scope to provide information not just on council buildings and services but on local businesses too - in particular, local businesses that are very small and rely upon the trade of local people and passing traffic for their survival. There is potentially a role for the council website to play in supporting and publicising such businesses with mapping data and location-aware services – thus contributing to the economic well-being of the area. In addition, there are not-for-profit organisations that support local people and that are reliant on volunteers to do so. Streetbank is a website established by a few enthusiasts who wanted to create an online forum for local

people to contribute goods, their skills and their spare time to other local people. This is a concept that could also work within the context of a council mapping portal, powered by geospatial information.

- Streetbank website:

  http://www.streetbank.com

However, what is evident from the K2 Advisory research is that, at the moment at least, the sharing of data is a 'one-way' relationship. In other words, the value for GIS professionals is perceived to be in getting mapping information out to citizens. Only a small proportion (12% - see Fig. 2) of practitioners believe that a key benefit of increased access to data is that it enables citizens to interact more as a means to keep data and information up to date (e.g. reporting damage to street furniture or roads). This situation could well change in future, as more people become familiar with web mapping portals and how they can be used to improve council services – certainly anecdotal evidence suggests that the number of interactions from the public is not insignificant and is growing gradually.

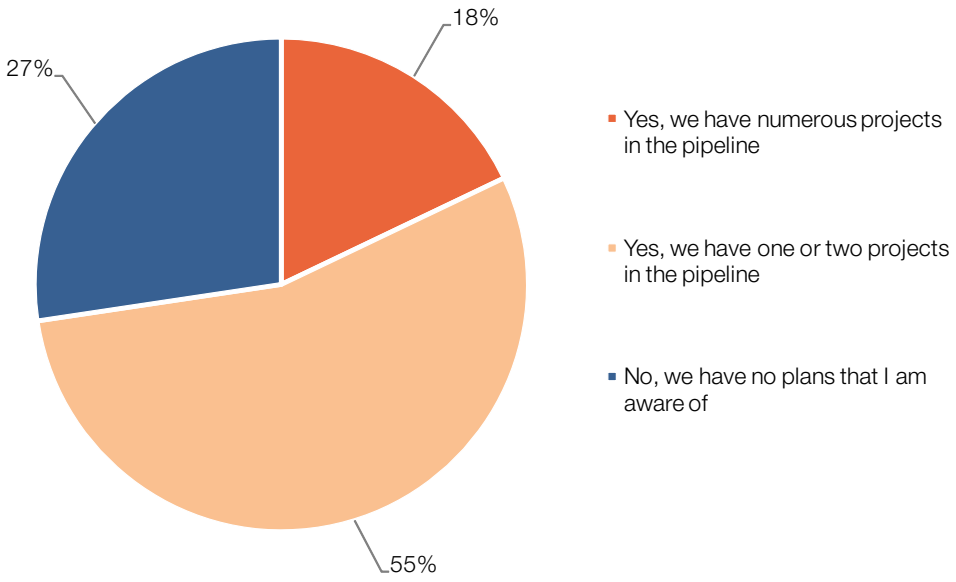
In the view of GIS practitioners, providing web mapping portal services really comes down to the practical benefits: it is not simply window dressing to appease citizen engagement initiatives, it has to add tangible value. K2 Advisory's view is that there is an opportunity to take this further by incorporating more non-council information – including that which is submitted by the public themselves.

While we see many examples of councils giving more mapping information to the public, there are of course the projects that fail (or could have worked better in hindsight), or even fail to get off the ground due to funding being withdrawn. So how can we expect the situation to evolve in the short-term?

K2 Advisory research shows that within the next six months (i.e. by November 2010), around three-quarters (73%) of local authorities expect to provide more location-based services to the public. Breaking that statistic down further, 55% of LAs have one or two projects in the pipeline, while 18% have "numerous" projects in the pipeline (see Fig. 3).

Fig 3 – GIS projects in the pipeline

Survey question: "Do you expect to provide more location-based services to the public over the next six months (for example, via your organisation's website)?"



The combination of a new Government and the economic deficit casts doubt over a range of public sector investment – this is certainly a period of uncertainty. However, K2 Advisory's view is that many of these projects will still come to fruition given that they are due to occur within a relatively short timeframe. Furthermore, one Highways manager told us: "If anything, we're more likely to move more into these kinds [GIS] of systems." He explained that while cuts were planned in his county council, GIS enables road engineers to travel less and to make decisions more quickly.

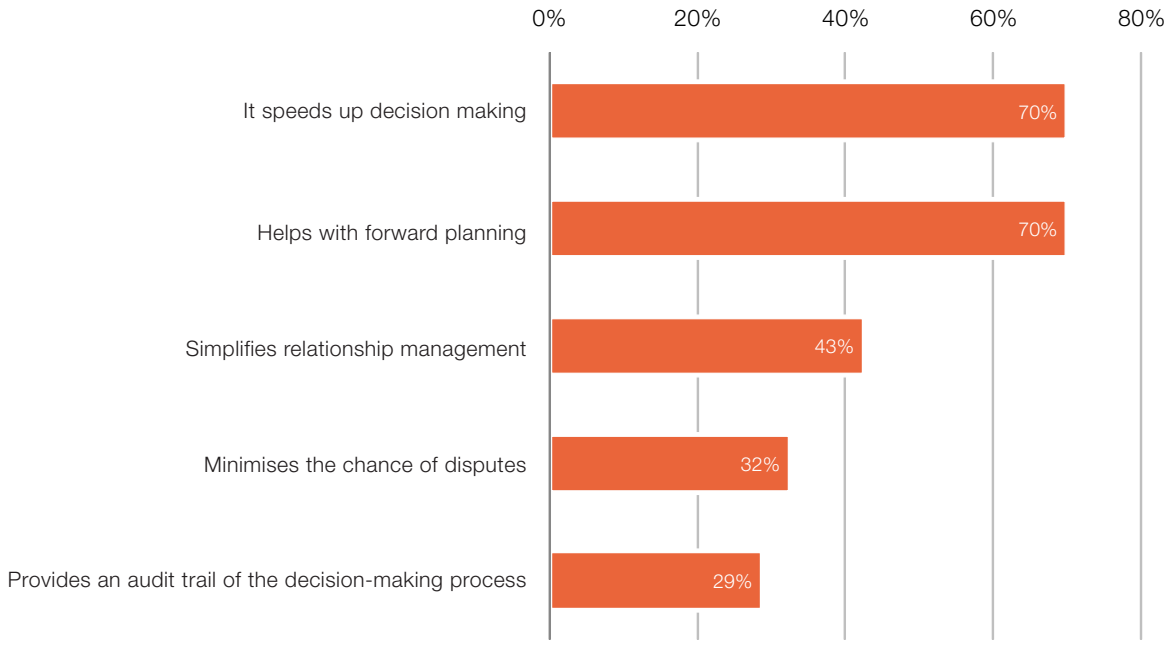
Sharing data with subcontractors

In addition to the public, LAs share data with other organisations, such as utilities companies – which creates benefits not only for those companies but for citizens as well. K2 Advisory's research into the views of GIS practitioners in UK local authorities shows they believe that increased sharing of data creates faster and more accurate decision-making (see Fig. 4). Councils have long been accused of failing to sufficiently co-ordinate roadwork required by water/gas/electricity/telecoms firms, for example. The outcome has yet to be perfected, but there have no doubt been improvements – as a direct result of the increased sharing of data.

In addition, GIS professionals acknowledge that sharing data can simplify relationship management with the many subcontractors they have to co-ordinate with on a regular basis.

Fig 4 – Benefits of sharing GIS data with suppliers and contractors

Survey question: "In your opinion, what are the greatest benefits of providing other organisations and/or sub-contractors (such as utilities companies) with increased access to geospatial data? Please select up to three from the options given below:"



Ordnance Survey opens up

Within this report we have explored some the ways in which local authorities are sharing mapping data they have purchased and created. Data sharing has been a growing trend of the late 20th and early 21st centuries, and we discuss at the start of this report the concept of the "democratisation of data". Take for example the recent move by the Ordnance Survey to make certain maps freely available as part of the "Making Public

Data Public" initiative established by the previous government. It means, for example, that local authority web developers can go to the OpenData website and freely use the maps to help create some of the web mapping portal services we refer to earlier in this report.

- Ordnance Survey OpenData website:

  http://www.ordnancesurvey.co.uk/opendata

Participants in this K2 Advisory study are split on whether this move by the Ordnance Survey will affect them. Indeed, a third do not know if it will affect them at all - the reason for this being that it is not clear how licensing costs relating to the Mapping Service Agreement (MSA) will be affected.

Having said that, the benefits of increased access to Ordnance Survey maps are acknowledged. For example, it:

- "….means that we have more nationwide spatial data to utilise"
- "….has given us some new mapping that are useful alternatives"
- "….gives access to more data for better base-mapping"
- "….means there is no need to supply sub-contractors with data that is now 'open', they can get it directly from Ordnance Survey"

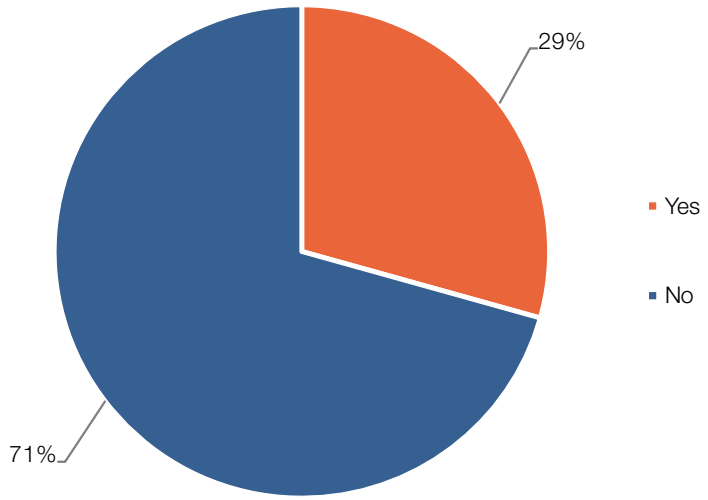
2.3 Data on the move

Mobile GIS for staff

There are some instances where the power of data can be significantly increased if it can be accessed and/or manipulated away from the desktop and 'in the field'. That said, 71% of local authorities do not currently provide mobile GIS services and/or applications (see Fig. 5). Yet any professional that is required at some point to work 'in the field' stands to benefit from mobile access to GIS – highways and planning are obvious examples. A restricting factor is how that data is accessed – in other words the availability of appropriate devices for members of staff, and the capability of those devices.

Fig 5 – Prevalence of mobile GIS applications

Survey question: "Does your organisation currently provide mobile GIS services and/or applications?"



This K2 Advisory research shows that there is potential to do much more with regards to the mobility of GIS. However, some local authorities have explained to us that they are short of the resource required to develop further the ways in which it could be used.

The research shows that mobile GIS is currently being used successfully in the following areas:

- Housing and building services
- Highways defects inspection (and GPS capture of assets and routes)
- Vehicle tracking
- Woodland management
- Waste and cleansing
- Public Rights of Way management

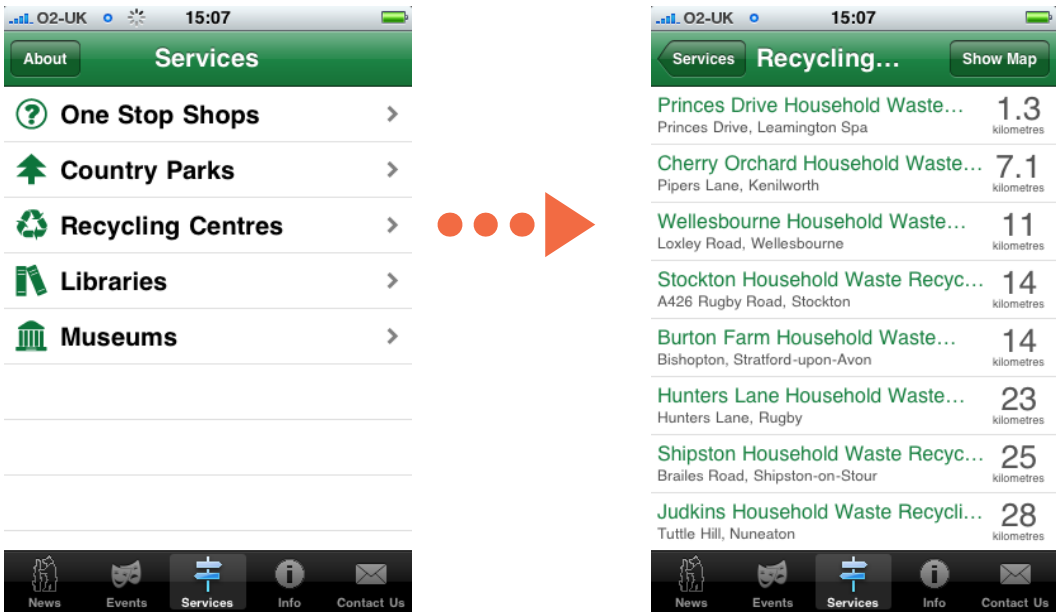
Buried within council departments are inspiring success stories (such as the road technicians who can now use a tablet computer to annotate improvements to safety barriers on location) that could be used internally to promote the benefits of mobile GIS, and therefore help to build a business case for further investment. This is something LAs should consider.

Location-based services for the public

The iPhone has really brought the power of being able to access data where and when it is most useful to life for consumers. Third sector organisations, such as the National Trust and Battersea Dogs and Cats Home have developed their own iPhone applications, and so too have a number of local authorities. For example, Warwickshire CC has an app that provides all of those really useful mapping-related services that many councils are now providing on their websites including information and services available, up-to-the minute news and events information, details on how to find key services, as well as how and where to get in touch with the Council.

- Warwickshire County Council iPhone app: http://www.warwickshire.gov.uk/iphone

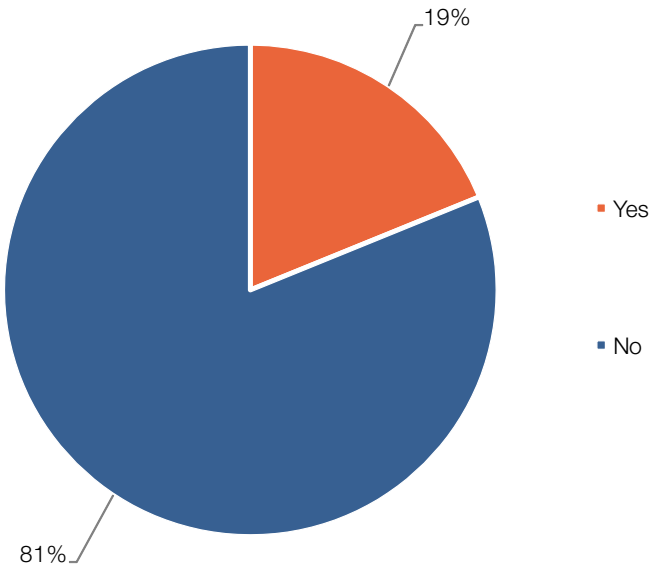
The advantage of the iPhone is the GPS element, and the related location-based services.



However, at the moment, 81% of local authorities do NOT provide location-aware services and/or applications (in other words, where knowing the real-time location of a user or citizen can be used in the provision of a service). See Fig. 6.

Fig 6 – Prevalence of location aware services and/or applications

Survey question: "Does your organisation currently provide location-aware services and/or applications (i.e. where knowing the real-time location of a user or citizen can be used in the provision of a service)?"



We expect to see a gradual (rather than a strong) increase in the number of authorities that provide iPhone (and eventually, iPad) applications. This is because despite the huge and almost unrivalled excitement that accompanies the launch of a new generation iPhone, it has yet to be adopted as the de facto smart phone standard of choice*. Relatively small demand for such applications makes it difficult to justify their development. Furthermore, the strain on IT budgets is only going to increase as the government unveils further the extent to which public sector organisations will need to cut back on spending.

The bottom line is that there are clear benefits in giving staff access to mobile GIS and enabling the public to have geospatial data 'on the move' – but there are cost implications. However, with reference to our earlier point on the inclusion of more data on local businesses and the activities of voluntary organisations, there could be a way to secure revenue (through advertising, for example) to fund such activities.

**12.6% of the UK population owned a smart phone as at September 2009. Source: Nielsen.*

2.4 A better single view of the citizen

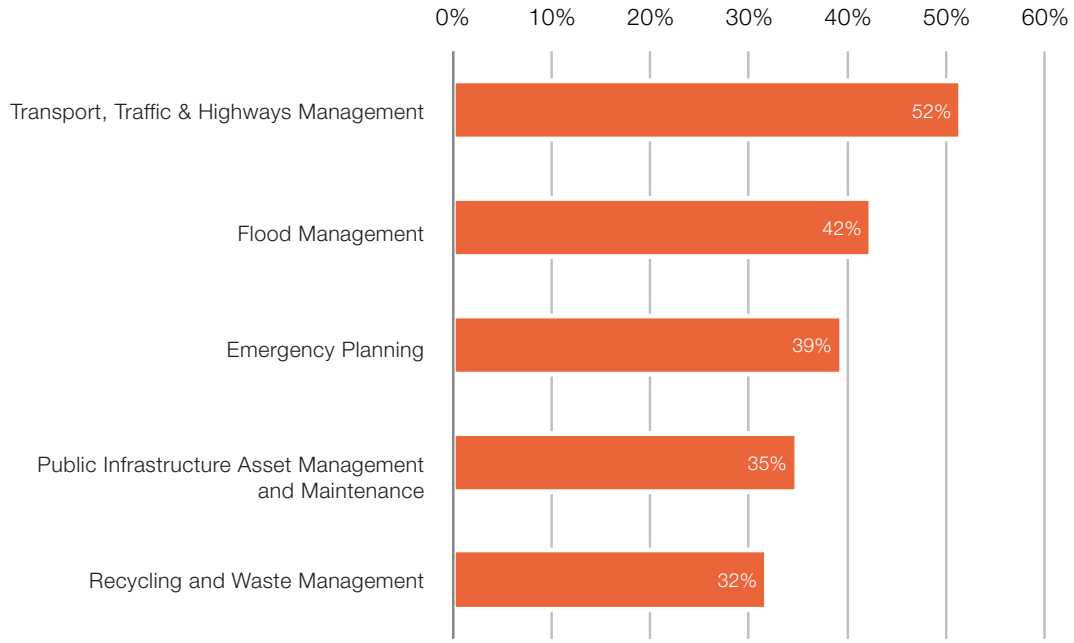
Local authorities have more data on residents than they have ever had before. But as is always the case with data, the power really comes when disconnected data sets can be linked together to build a more comprehensive, multi-dimensional 'picture'.

In the case of geospatial data, integration with other business applications (such as CRM and ERP) can be used to create more accurate and holistic information about citizen behavioural patterns to facilitate more informed decisions about resourcing, funding and budgeting. Better decision-making ultimately leads to better services.

K2 Advisory research shows that **transport, traffic & highways management** is the area where the increase in the use of geospatial data to inform better decision-making is the greatest (see Fig. 7). For example, faced with road networks carrying increasingly high volumes of traffic, councils are looking to geospatial data to help steer investment and allocation of resource (e.g. use of road engineers) as a means to ensure smooth traffic flows. By understanding more closely the travel patterns, levels of usage and road/tarmac conditions, they are able to do this.

Fig 7 – Activities where location-aware services will have most impact

Survey question: "In the recent past, in which of the following areas have you seen the greatest increases in the application and use of geospatial data to enable better decision-making? Please select up to five from the options given below:"



The area that has seen the second highest increase in the use of geospatial data to enable better decision-making is emergency planning. Business continuity is a highly important area for councils to address, and it will always remain high on the priority list. The more data that councils can feed into understanding and preparing for threats (e.g. floods and epidemics) the safer we are as citizens.

Integrating GIS with other applications

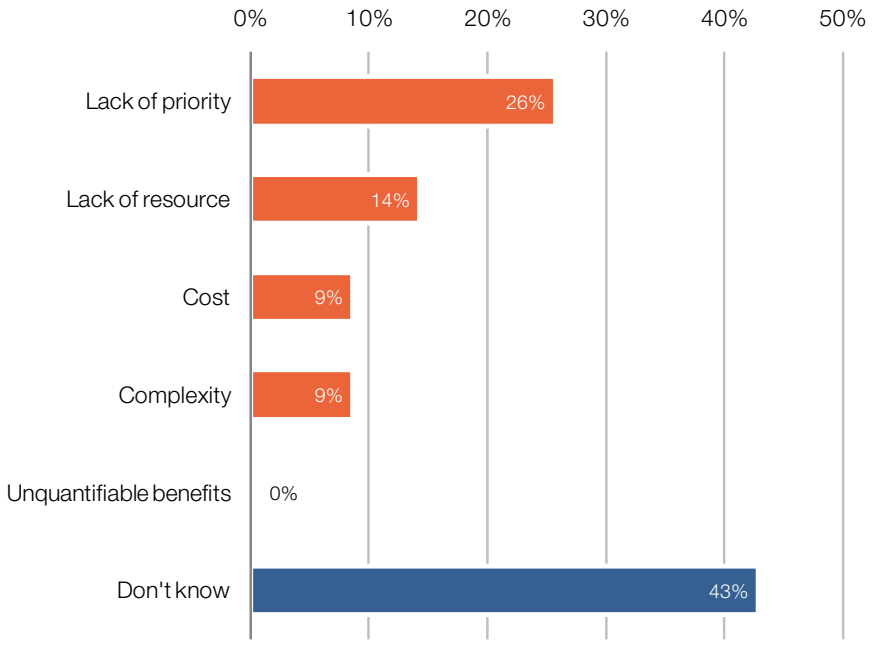
Local authorities are not just concerned about safety of course – they have a duty to provide quality of service to the public as well. By integrating GI systems with other core business applications, such as CRM or ERP, councils can start to build a more comprehensive representation of residents and their needs. It also means front line staff can make better and quicker decisions when working directly with the public either online, via service centres, or face-to-face.

K2 Advisory research shows that local authorities are split almost 50/50 in terms of whether their GI systems are integrated into core business applications. The 47% that have done so say it enables improved data sharing, which means staff have a single source of information that is easier to update and that can allow for more informed decision making. One GIS professional told us: "GIS has enabled our CRM team to answer 90% of enquires without reference to back office staff".

About one quarter (26%) of GIS professionals questioned for this research said that the main reason for the lack of integration is that it is not considered to be a priority project – that is despite the clear benefits (see Fig. 8). What is interesting is that a large majority (43%) said that they do not know why these projects are not happening. K2 Advisory's view is that this is because this kind of strategic decision-making belongs with the office of the CIO (Chief Information Officer) or IT Director. If this is the case, there is a job for IT to do in educating other stakeholders within the business about the benefits that can be gained from integrating powerful, data-centric business applications.

Fig 8 – Reasons for lack of GIS integration with other systems

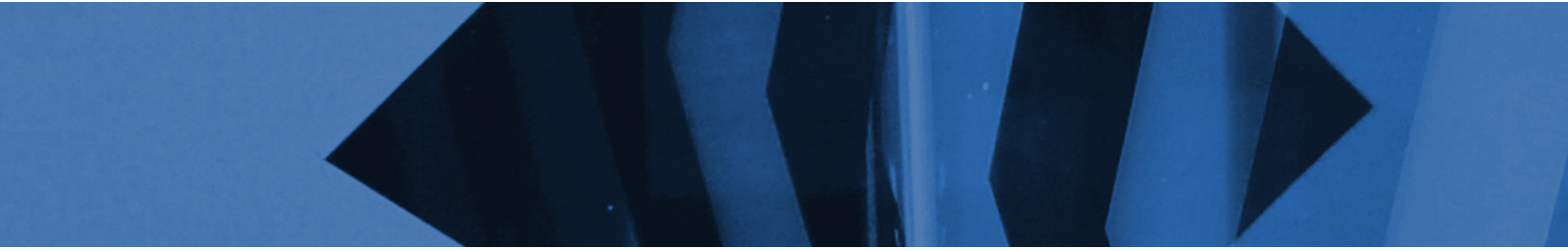
Survey question: "Are your GI systems integrated with other core business applications, such as CRM or ERP? – If not, what is the main reason for this not happening?"



It is K2 Advisory's view that the number of local authorities who have integrated GIS with other core applications is likely to grow - but only very slowly, given the complexities (and costs) associated with such a task. In this regard GIS vendors have an important role to play in helping to educate and inform public sector CIOs and IT Directors of the benefits they can expect from integrating GIS and underlying geospatial data with other business applications.

2.5 The evolution of software delivery to a cloud computing environment

The urgent requirement for the UK Public Sector to provide cost-savings, especially in IT projects, combined with the rise of cloud computing as a delivery model makes it inevitable that cloud computing will in some form become part of public sector IT initiatives. When it comes to GIS specifically, 77% of survey participants think that their organisation would benefit from the ability to integrate cloud delivered geospatial data with existing internal GIS systems.



G-Cloud is the most popular way forward

The UK Government Cloud (G-Cloud) project is to create a government cloud infrastructure that enables public bodies to select and host ICT services from a shared environment. The G-Cloud will offer multiple services from multiple suppliers so that public sector organisations can switch suppliers if they experience service or delivery issues. In other words, the plan is that G-Cloud will provide a single access point for the provision of ICT services, applications and assets and will thus enable billions of pounds of savings per year as outlined in the Operational Efficiency Programme.

From previous K2 Advisory research into cloud computing adoption within UK public sector (see below) we understand that the majority view is that G-Cloud should be offered as an opt-in method of sourcing IT for government rather than being made a mandatory sourcing requirement.

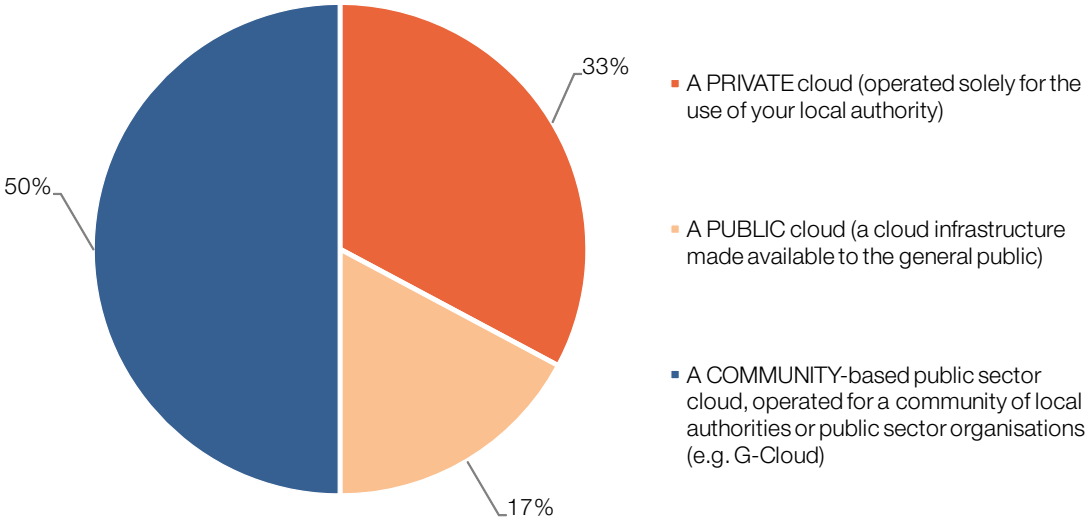
- K2 Advisory "Cloud Computing: A Step-Change for IT Services" research:

  http://www.k2advisory.com/research/cloud-computing-step-change-it-services

However, the view among GIS practitioners is that if it were mandatory for their organisation to move to a cloud computing model as part of public sector efficiency drives, 50% would opt for a community cloud solution, such as G-Cloud. See Fig. 9 below.

Fig 9 – Preference of Cloud model if Cloud became compulsory

Survey question: "If it were mandatory for your organisation to move to a Cloud Computing model (e.g. as part of Government public sector efficiency drives) would you be more comfortable with accessing your geospatial data from...:"



This finding can be seen as an endorsement of the G-Cloud approach. It may also indicate that the majority of Local Authorities do not yet have a cloud computing strategy in place, and, consequently, adoption of a shared service or community-based approach in the form of G-Cloud offers the most pragmatic way forward should the cloud delivery model become a requirement.

About K2 Advisory

K2 Advisory is a Sift Media business. Its analysts apply a Horizon Scanning methodology to research in order to help organisations develop strategies for possible future scenarios. We focus on the essential areas for the future success of organisations and their IT service delivery capability. In 2010, these areas of focus are Cloud Computing, Sustainability, Innovation, Skills, Outsourcing and Software Satisfaction.

The K2 approach to analysis is underpinned by its links into the professional communities run by parent company, Sift Media. This eco-system of professionals and senior executives in Finance, Public Sector and Human Resources provides us with unrivalled connections into decision-making and budget-holding roles within organisations, such as CFOs, Finance Directors, HR Directors and Procurement Officers. In addition, K2 draws on 30 years of experience advising the CIO community.

About the authors

This study was conducted by Dr Katy Ring and Kate Hanaghan, analysts at K2 Advisory. If you would like to learn more about the research, please email either:

katy.ring@k2advisory.com

kate.hanaghan@k2advisory.com

Dr Katy Ring - Director

A renowned analyst, Katy was previously a Principal of Bathwick Group before founding K2 Advisory. Katy also set up NelsonHall's ITO research capability. Prior to that she spent 12 years at Ovum leading research into the opportunities for emerging software and services markets as well as developing the company's Outsourcing Practice.

Kate Hanaghan - Research Manager

With many years of experience as an analyst in the IT services industry, Kate manages the K2 Advisory research programme. Prior to K2, Kate was a Senior Analyst with Bathwick Group where her focus was the European IT services market and industry. Prior to this, Kate was a senior analyst in Ovum's IT Services Practice.

K2 ADVISORY

6th Floor, Bridge House
48-52 Baldwin Street
Bristol BS1 1QB
United Kingdom

Tel: +44 (0)117 915 3344
Fax: +44 (0)117 915 9630