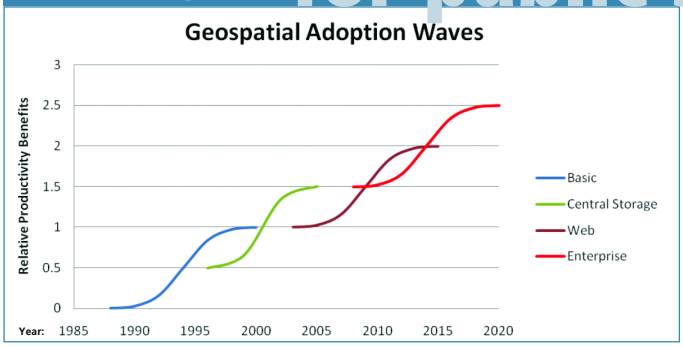


*Figure 1*

# Location economics: valuing GI for local public service delivery

Proving value from GI and location based services is not always easy. Using proven modelling techniques, the authors show how public service policy makers in England and Wales can be shown clear benefits.

WHILST THERE ARE many case studies that make an eloquent pitch for the value of using geospatial information (GI), few express the benefits in financial terms. This often leads to a "so what?" response from senior managers. In today's harsh economic environment the mantra is "save money and prove it!" The only new projects that are likely to be approved are those which can show cashable savings and rapidly.

This problem is particularly acute for local public sector providers such as local authorities, emergency services and local health services. GI already underpins many services and policy decisions but without economic justification the resources that provide these services and the investment required to extend them are under threat.

Against this backdrop, the Local Government Association (LGA) commissioned ConsultingWhere Ltd. to (i) provide a better understanding of the value that GI offers in economic terms to local public service delivery within England and Wales and (ii) to recommend ways in which this might be further enhanced in the future. ACIL Tasman, based in Canberra, Australia, which had undertaken similar exercises in Australia and New Zealand, were engaged by ConsultingWhere to assist in the economic modelling and the expression of the results in terms that policy makers would understand.

**Approach** The initial stage of the study included primary and secondary research, interviews, a workshop with key opinion formers and discussions with many interested parties. The assembled evidence was then packaged for analysis using ACIL Tasman's computable general equilibrium (CGE) model, which provides a representation of the local public service sector in a national and international context. When an economic shock or disturbance such as an increase in a sector's rate of growth is applied to the model, each of the markets adjusts to a new equilibrium according to a set of behavioural parameters, which are underpinned by solid economic theory.

**Policy Drivers** To gain credibility, any investment must support the political agenda. The project team identified a series of broad policy directions where geospatial clearly "intercepts" the Coalition Government agenda, to guide selecting areas for further study:

- **Operational efficiency:** the need to reduce costs while delivering high quality services;
- **Shared Services:** working across organisational boundaries and to operate through partnership;
- **The Big Society:** local government as an enabler of a more self-service approach that facilitates citizens to act for themselves; and
- **Information economy:** the move to 'data democracy' and greater transparency.

It also identified sector-specific statutory regulation, which relies heavily on GI. Key examples, referenced in the study, include planning; traffic management; flood risk and environmental protection.

**Adoption Waves** To understand the maturity of the implementation of GI across the sector, and to inform predictions of future growth, we looked at patterns of adoption and diffusion of the technology. We identified four waves of innovation commencing around 1990, see Figure 1. The first wave saw basic GIS on desktops, with the second wave the gradual linking of databases gave public service providers wider access to internal data. A third wave began in 2000 with the introduction of web mapping, has seen informational and transactional usage. This wave is still working its way through local government. A fourth wave, involving the integration of these technologies into mainstream enterprise systems and the interoperability of data across organisations is just getting underway. Much of this research is based on work done by the LGA in 2009 in their Geographical Information survey.[1]

We concluded that the value of GI will only be fully realised once this wave has been completed. Furthermore, we can expect the benefits to accrue from enterprise deployment at a faster rate than has been observed to this point.

**Barrier to Adoption** A survey of the local public services community identified the top three barriers to further implementation of GI as (i) lack of awareness of benefits and resistance to change amongst users; (ii) implementation costs (hardware and software); and (iii) inappropriate data pricing and/or restrictions on access.

There is a range of possible explanations for the "sub-optimal" rate of progress in implementation

1. http://www.lga.gov.uk/lga/core/page.do?pageId=6597688

> ***...we can expect the benefits to accrue from enterprise deployment at a faster rate than has been observed to this point.***

# valuing GI for public services

based on the experience of the study team in other sectors and geographies:

- Capacity building issues – lack of necessary human resources with the right skills and knowledge;
- Policy conflicts;
- Lack of incentives for managers to make changes;
- Concerns about mistakes or inaccuracies in the data or maps impacting on reputation or fears of potential litigation if data are released;
- Data "hoarding" – where officials seek to maximise remit or influence by retaining control of information; and
- Institutional inertia.

Fortunately, powerful paradigm shifts in the market are offering opportunities for step change, including technological advances such as location-based services designed for the consumer market but applicable to local public service delivery. Open source, shared procurement and site licensing are also positive trends in the market, driving down solution costs and encouraging competition.

**Case Study Results** The case studies reveal strong business cases in many application areas, including:

**Channel shift** – through deployment of transactional web mapping systems to move the main method of communication between citizens and providers from face to face or telephone contact onto the Internet. South Tyneside (**Case Study 1**) illustrates the savings achievable.

**Improved transport efficiency** – by wide application of route optimisation and better streetworks management. Daventry District Council has been through two generations of route optimisation with dramatic results in terms of reducing costs.

**Better decision making** – using geospatially-enabled local information systems. There has been some very impressive work done to prove savings in this area, led by Professor Paul Foley of De Montfort University[2]. The Nottingham Insight project is a prime example of using the quantifiable benefits methodology, developed in this study (**Case Study 2**).

**Reduced data duplication** – using master datasets such as the National Land and Property Gazetteer (NLPG). A detailed analysis of the value of the NLPG data sharing alone shows net benefits over a five-year period in the range £15-£24million.

**Empowering frontline workers** – by speeding up analysis and enhancing mobile working.

**Helping identify social deprivation** – through data integration and analysis.

The research also found that the average annualised cost to benefit ratio was approximately 1:2.5 considered over an average five-year project life cycle, i.e. for every £1 invested a return of £2.50 would be realised over this period. The raw analysis suggests a figure closer to 1:3.75 but we have reduced our assessment on the basis that our sample has a bias towards more innovative and better managed projects.

The case studies also provided insights into the further increases in productivity that could arise by 2014-5. Drawing on the adoption waves, it was estimated that by this period, further innovation could lead to a 33 per cent increase in these productivity estimates for the business as usual case. We assess that an additional 25 per cent increase in take up could be realised under the optimal policy case.

**Wider Economic Impact** The economic modelling estimated that Gross Domestic Product (GDP) was approximately £320m higher in 2008-9 in England and Wales than would have been the case without adoption of GI by local public services providers.

Under a business as usual scenario, this would be expected to rise to an estimated £560m in 2014-5, but with more rapid introduction of government policies to free up data access and copyright and with improved awareness of the value of GI at senior management level, this could be improved to an estimated £600m by 2014-5, with significant gains across various areas, but particularly in local health care.

Furthermore, taxation revenue was £44m higher than it would otherwise have been and this could rise to be £95 million higher than it would otherwise be with favourable policies towards geospatial.

We also estimated that the improved services have led to about £120m per annum improvement in the productivity of the construction, land transport and business services sectors. In addition, there was a general increase in labour productivity equal to an increase of approximately 1,500 full-time equivalent staff across the economies of England and Wales. This is as a result of the accumulated effects of improved citizen and business contact with local service providers.

**Recommendations** The report's strategic recommendations for improving the rate of adoption of GI and the consequent benefits include gaining political commitment, increased accessibility of public data, a "light touch" approach for copyright and licensing, raising geospatial awareness and a training for those developing the business case for geospatial projects. The full report can be accessed from the following site: **http://www.consultingwhere.com/reports.html**

2. www.communities.gov.uk/publications/communities/establishlocalinfo

**Case study 1: Improved services in South Tyneside enabled by GI**

The Metropolitan Borough of South Tyneside utilised GI to create the 'My South Tyneside' web facility. It is designed to be quick and easy to use and includes a property search facility based on the Local Land and Property Gazetteer (LLPG) and "My Nearest" search facility for finding schools, libraries and other local facilities. An email alert service enables citizens to receive regular alerts about local planning applications, road works, etc.

The web statistics for the council site are impressive and the email alerts service has over 2,000 subscribers since its inception. 2009 saw 38,295 unique visits to the site. Research carried out by SocITM calculated typical transaction costs of £0.17 for a web transaction, £4.00 for a phone transaction and £7.81 for a face-to face transaction. Using these figures, estimated costs for web transactions, as opposed to phone transactions, represent ***an estimated saving of £146,669*** in the calendar year.

**Case study: 2 Better decision in Nottingham**

Nottingham City Council, working with the local NHS, police, districts and county council have created a Local Information System designed to provide a platform for better decision making for the city's Strategic Framework and the policies and plans that support it. It provides ready access to comprehensive, up-to-date information to a very fine-grained level, which in tandem with the site's analytical tools, enables decision-makers in service planning and policy implementation to assemble evidence to support strategic choices. Almost all the information within the system is geospatially referenced, so not only does it aid visualisation but supports a wide range of geospatial analyses. The Insight team estimate that at least 70% of all uses would not be possible without the geospatial information capabilities.

Using the online value assessment tool, from the CLG study they assessed the net benefits, taking into account development and ongoing support costs, of Nottingham Insight at ***between £320,000 and £460,000*** per annum.

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