



British Waterways – How GIS is helping to manage Britain's canals and rivers

THE CLIENT

Britain's canals and rivers support a diverse range of activity from leisure to commercial purposes. Both public and commercial organisations interact with or rely on these inland waterways on a day-to-day basis. This represents a huge challenge to British Waterways which is responsible for managing the 2000 mile water network and its associated infrastructure.

British Waterways head office is based in Watford and there are 10 regional waterways units. The organisation employs around 2000 employees.

THE CHALLENGE

Managing and maintaining the waterways, mapping visible and hidden assets, managing water sales, keeping the waterways clear of fly-tipped rubbish, consulting on planning applications and carrying out surveys into the surrounding areas are all critical for British Waterways. It is a time consuming role for each of its ten regional offices and one that can create a huge amount of paperwork and duplicated effort if not administered effectively.

In order to improve the efficiency of its operation, British Waterways faced a number of issues. The main problem within the organisation was that there was no definitive, central database of its asset and property holdings - only various disparate databases and paper-based records. British Waterways needed to define and map its property boundaries and identify which assets fell within its jurisdiction.

This included hidden assets such as Culverts - small underground tunnels which enable streams to pass under canals and which are used in low-lying places to drain water under the canal after wet spells. It was particularly important that the whereabouts of these were mapped as if they become damaged, it can lead to dewatering of the canal.

Achieving time and cost efficiencies in business processes was also important through automating activities and producing tailored business documents. It was also essential to be able to disseminate information across the organisation in order to reduce the duplication of effort and data that was occurring.



SOLUTION & CAPABILITY DELIVERED

It was clear to Saul Davies, British Waterway's Senior GIS consultant, that a corporate geographic information system (GIS) combined with an enterprise resource planning (ERP) solution, was the way forward. 'Our core business is asset and property management so it is essential to know where our holdings are and provide a consistent view to everyone across the organisation. Additionally, we undertake such a wide range of activities, we wanted technology in place that could support us by providing working efficiencies. GIS, with its many forms, combined with an ERP solution was the only way to achieve this.'

In 2000, British Waterways decided to implement a full corporate GIS, recognising that the benefits and efficiencies would only be achievable by fully co-ordinating effort and work across the entire organisation.

Then in 2003 an ERP system from SAP was integrated with the GIS providing a uniquely powerful tool for managing and visualising their asset information.

The solution has delivered a range of capability:

- All asset data is now held centrally and is accessible across the organisation
- Users can access information using either the GIS or SAP interface. This includes the ability to raise work notifications in SAP from the GIS, ensuring locations are recorded accurately
- Specific site plans can now be produced in-house instead of purchasing wider mapping, resulting in considerable cost savings
- Mobile GIS has digitised and streamlined paper-based collection in the field.

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DELIVERING SUCCESS

WHEN BRITISH WATERWAYS WAS LOOKING FOR A WAY TO CONSOLIDATE AND MANAGE ITS ASSET INFORMATION AND ACHIEVE PROCESS EFFICIENCIES, IT CHOSE ESRI GIS INTEGRATED WITH ENTERPRISE RESOURCE PLANNING SOFTWARE. THE NEW SOLUTION HAS INTRODUCED SIGNIFICANT MONEY, TIME AND EFFORT SAVINGS AND BETTER BUSINESS PLANNING.

Benefits include:

- £400k pa cost savings achieved by reduced reliance on external suppliers
- Reduced duplication of information and effort
- Significant time savings through process automation
- Improved data capture from the field with GIS enabled mobile devices
- Better business planning with extensive GIS based analysis tools



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BENEFITS

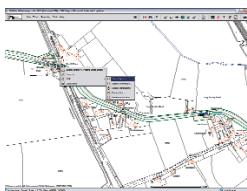
British Waterways has seen significant benefits from the integration between the two systems

GIS was used to consolidate the various databases and digitise paper-based records of British Waterways' ownership boundaries and holdings and transfer the information into SAP to create a definitive, centralised record. Hidden Culverts are also mapped using mobile GIS. Whilst a bridge or building may be marked on existing mapping, locating these hidden assets requires operational knowledge of where they are. British Waterways uses handheld devices running ESRI's ArcPad mobile software to capture the location of these assets and then load this data in to the GIS and in turn feed it back to SAP.

The creation of this central repository has not only significantly reduced the duplication of information and effort that had been occurring but also allows British Waterways to allocate funds for upkeep and maintenance more effectively.

The GIS provides an easy-to-use interface into the data held within SAP. Whilst the integration provides a two-way link between the systems, many users prefer to use the GIS as a route into SAP to find information.

'The GIS interface makes data in SAP very accessible' explains Davies. 'Most people can understand and navigate using a map and because they know

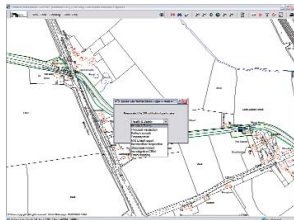


The GIS provides an easy-to-use interface into SAP

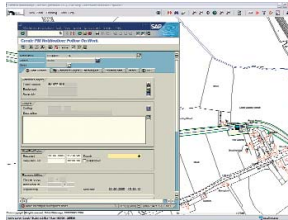
their own patch are able to find what they are looking for, a bridge for example, more quickly by zooming to it on the map.

They can then drill down in to the additional information held within SAP - for example what is the bridge constructed of, does it have any work notifications attached to it?

Significant time savings have also been achieved. For example, users can raise work notifications within SAP from the Intranet GIS interface. If a customer calls in to report fly tipping by a canal, the call operator can use the map and the customer's description to locate the area and asset in question. They can then raise a work notification from the map screen detailing the problem.



Users can raise work notifications in SAP from the GIS



The system automatically takes you in to the right screen in SAP, fills in fields such as the asset name and based on its geographical location assigns it to the correct waterway unit and responsible supervisor.

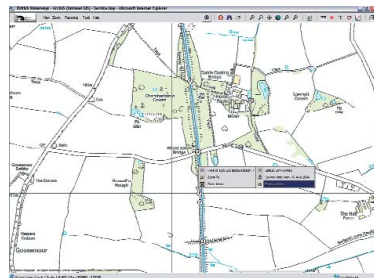
'The mapping interface and automated process saves at

least a day in what was a labour intensive task' says Davies.

Davies also quotes another time-saving example. The Water Sales team sells water via abstractions to businesses and for agricultural use and all of the abstraction points have been mapped in the GIS. When someone recently called in to report what they thought was illegal water abstraction, the call operator was able to use the GIS to identify that it was in fact a legal abstraction. Without this information on the GIS, it would have taken at least two days to complete a site visit and reference various datasets to confirm this.

Another significant benefit has been the cost saving achieved through producing paper based products, for example site plans, in house rather than purchasing them from external suppliers. The Estates team uses the GIS to produce site plans to give to third parties working on the waterway network or to support property deals. Rather than purchasing the appropriate Ordnance Survey map, they can now print out just the relevant area from the GIS. This saves British Waterways an estimated £400,000 per year.

The mobile GIS technology has also enabled British Waterways to electronically capture environmental survey data which in the past would have been collected on paper. For example, a tree management plan has been devised by surveying trees along the canal for pruning requirements, disease etc. This has been further enhanced by the ability to take a picture of the trees with a camera which is built in to the handheld device. This information is then loaded in to the desktop GIS and work notifications are raised. When a contractor comes to do the work, a site plan and photograph of the tree is produced to make identifying the area and particular tree much quicker and more accurate.



Photographs can be captured and linked to the map

The desktop GIS has also given British Waterways the ability to perform in-depth analysis of data. For example, its Birmingham office has been using the GIS to profile hotspots of different types of crime activity such as fly-tipping and anti social behaviour. This allows the organisation to understand the costs to the business of dealing with crime and has helped to target resources to relevant locations

The Future

There are a number of plans to expand the use of GIS within the organisation. An intranet-based system will go live this year which will automate the processing of the 200 planning applications that come in to BW each month. With a statutory requirement to turn these around within 21 days, once the spatial information has been captured in the GIS, emails will automatically be sent to internal consultees to direct them to the application online. They will be able to make comments on the applications which the local planner will collate to generate an application response letter.

The organisation is also looking to implement a more advanced mobile working solution through Mobile SAP with a GIS/GPS interface. As Jonathan Marshall, British Waterways Geographic Information Manager explains: 'We want to take our IT systems a step further by enabling our staff to access all relevant information in the field, along with the ability to raise work notifications without having to return to the office'.

The Technology

The corporate GIS solution provided by ESRI comprises a central geo-database and an Intranet GIS to provide all employees with access to the data as well as basic GIS functionality. The ten regional offices also have desktop GIS to carry out more in-depth, project-based analysis and Mobile GIS software for carrying out environmental surveys and mapping hidden assets. Davies explains: 'The functionality within ArcGIS meant that in terms of the enterprise solution, it ticked all of our boxes. There aren't many other products that can compete on all levels, to the degree of functionality ESRI has'.

Customer Quote

'Prior to implementing our ESRI GIS and SAP, we did not have a consistent view of our assets and it was almost impossible to distribute information around the organisation' concludes John Lancaster, Managing Director at British Waterways. 'Our paperwork records and registers were held regionally and were out of date as soon as they were printed and regional databases were inaccessible to other areas of the business. Now all of our information is held centrally, we all have access to up-to-date information allowing us to perform our jobs much more accurately and efficiently. We have proved that the saying 'capture once, use many times' really does deliver significant efficiency savings'.

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