

Biwater

Process	Asset management
Users	Operations management
Hardware	GPS vehicle tracker
Software	Various GIS
Location	Nationwide, UK
Cost	£20,950
ROI	Payback in seven months


Business Problem

Biwater have a large number of mobile, two or three man, teams providing pressure, flow, leakage and monitoring surveys on water and sewerage networks. To continue gaining projects, a new angle was needed to improve efficiency and client confidence. The logistics and information about the fleet was targeted as an area for improvement. Knowing where teams are is important as they have specific client response targets.

Business Solution

Installing tracking systems in the vans enables the office to increase the efficiency of the daily logistics, particularly when immediate response calls from clients are received. When clients need water infrastructure surveying, the information can now be obtained more efficiently. Clients also have greater confidence in the times given by the Biwater office as they can obtain accurate information on the location of the fleet.

Background

Biwater carry out pressure, flow, pipe location, leakage control and asset condition surveys on water and wastewater infrastructure nationwide. They need a way of accurately knowing where their vans are and hence how quickly they can get the most suitable/nearest team to urgent client calls.

Process

When receiving reactive service calls the office staff at Biwater look at the location of the fleet in the area and allocate the best team for the job who are closest to the location. They can then also track how long jobs for that client are taking the team. This information is also available to the client.

Solution

Originally the location of teams was hard to confirm and there was a lack of proof of accurate information about how long teams had been on that job. Now the times and locations of teams are exact, both office staff and clients know how long it will be until a team can get to a new site and which is the best team to use.

Costs

The tracking devices were the most expensive item, followed by the cost of staff time. Most of the infrastructure was already available and Biwater are using their existing project database. The key areas of expenditure were:

- The tracker devices at £695 each, total circa £10,500 (for the first 15 vans);
- The communications (SIM cards etc.) is £225 plus approximately £200 a year call charges (for the first 15 vans);
- The software cost £2,500 plus £375 annually;
- Staff costs and research time add together to £6,000.

Benefits

The main benefits derive from having improved logistics for the 150 vans that Biwater operates in this country. Biwater can now monitor KPIs for the fleet and clients can see the service more clearly. In 2002 water companies paid approximately £1.2m in failure of service compensation to customers, so these improvements are welcome to clients.

Business Benefits

Cost

Most of the cost benefits from implementing the system are indirect. Clients have a greater confidence in the service provided and Biwater benefits from issues such as having more reliable staff. There have been occasional incidents of staff using the vans for non-business use, which would previously have gone unnoticed.

The improved logistics has also reduced mileage, hence reducing the fuel costs (and also maintenance costs) of the fleet. To further decrease costs nearly half the fleet have now been changed over to LPG fuel, and more will use LPG as and when the vans are renewed.

The water companies have to record when water supplies are subject to unplanned interruption and most pay compensation to their customers when this is for a period of longer than six hours. In 2002-3 the water companies paid compensation (minimum £20 domestic, £50 commercial) to 3,800 customers for unplanned water service failures under the guaranteed standards scheme (OFWAT Levels of service for the water industry in England and Wales, 2002-2003 report). The new improved logistics from Biwater should help reduce this number.

Time

Response times have reduced and Biwater can now monitor the KPI levels of performance for vans and staff. It is difficult to compare with previous performance levels as they have no accurate comparable measure of these.

Quality

The clients now get a more transparent view of the Biwater field technicians. They are provided with accurate knowledge of locations and hours worked which results in greater predictability of time and quality of service.

Return on Investment

From interrogating the information produced by the tracker software, managers at Biwater assess the return on investment to be about seven months. There are fewer miles travelled by using the system to improve the logistics and the technicians no longer use the vans for unapproved personal use. As no accurate comparable information is available prior to the installation of the system, these savings are estimated from historical information.

Champion

Alasdair Harry, the Operations Manager championed the introduction of this system.

Implementation Team

The implementation of the initial system took five months. Now that this has been completed, Biwater feel that it would be possible to implement other systems in one month. Adding further teams to the system will be much easier now that it is fully established.

The Operations Manager was the main person involved in the implementation process.

To install the GPS tracker boxes Biwater required a car electrician and for commissioning the system they used two in house technical staff.

Training

Training is a relatively small issue in this case compared to most mobile technology projects. The technician teams don't have to learn anything new. The office staff has been given a few hours training in use of the tracker software.

Technology Usage

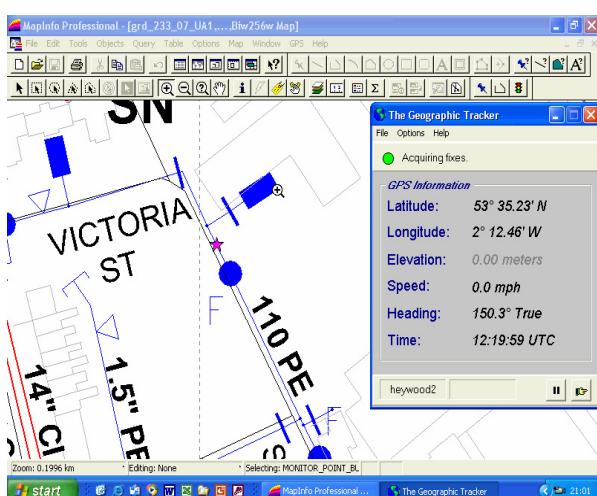


Team tasks

Teams usually work in regional areas with responsibility for one client and survey the water or wastewater infrastructure as required. They then send the information both to the client and back to the office. The teams mix their planned and reactive jobs according to the priority given to them by the client. This operation is nationwide so teams in the South East may have different issues to the teams in rural Scotland.

Technology usage

The black GPS tracker box is installed in each van by a vehicle electrician. The box communicates through a mobile phone to update the information on the tracker software at the office. The tracker box stores information until it is requested by the system and then it sends an update. It stores the position, direction, speed and distance travelled of the van and whether the engine is running.



Why employ this technology?

The technology is used to keep track of assets, especially useful for expensive equipment and people. It gives an accurate picture of the van's position and speed at any time. There are many advantages of knowing where assets are, especially if they have been stolen and the police are trying to track down the vehicles.

Implementation Costs

How much did it cost to implement this solution?

Description	Notes	Cost
Up front investigation costs	Research resource time.	£2,000
The mobile computing devices	Tracking devices at £695 each.	£10,500
The software application	FASTMAP asset tracker and Microsoft Map Point. Plus £375 annual software licensing.	£2,500 plus £375 yearly
The communications infrastructure	Vans on "pay as you go" SIM card with £15 of call credit per year. Line rental and call charges for base unit approximately £200 per year (dependant on how many devices).	£425 a year
The data storage system	A standard PC with a large amount of RAM.	£750
Consultancy service costs	In house.	N/A
Site installation costs	£50 per unit for each van tracker.	£750
Personnel training costs	Given by the supplier.	£450
Staff costs	Over about 9 months.	£4,000
Support costs	Included within the annual charges for software and line rental.	
Total	Over 3 years approximately £25/van/month.	£20,950 plus £800 pa

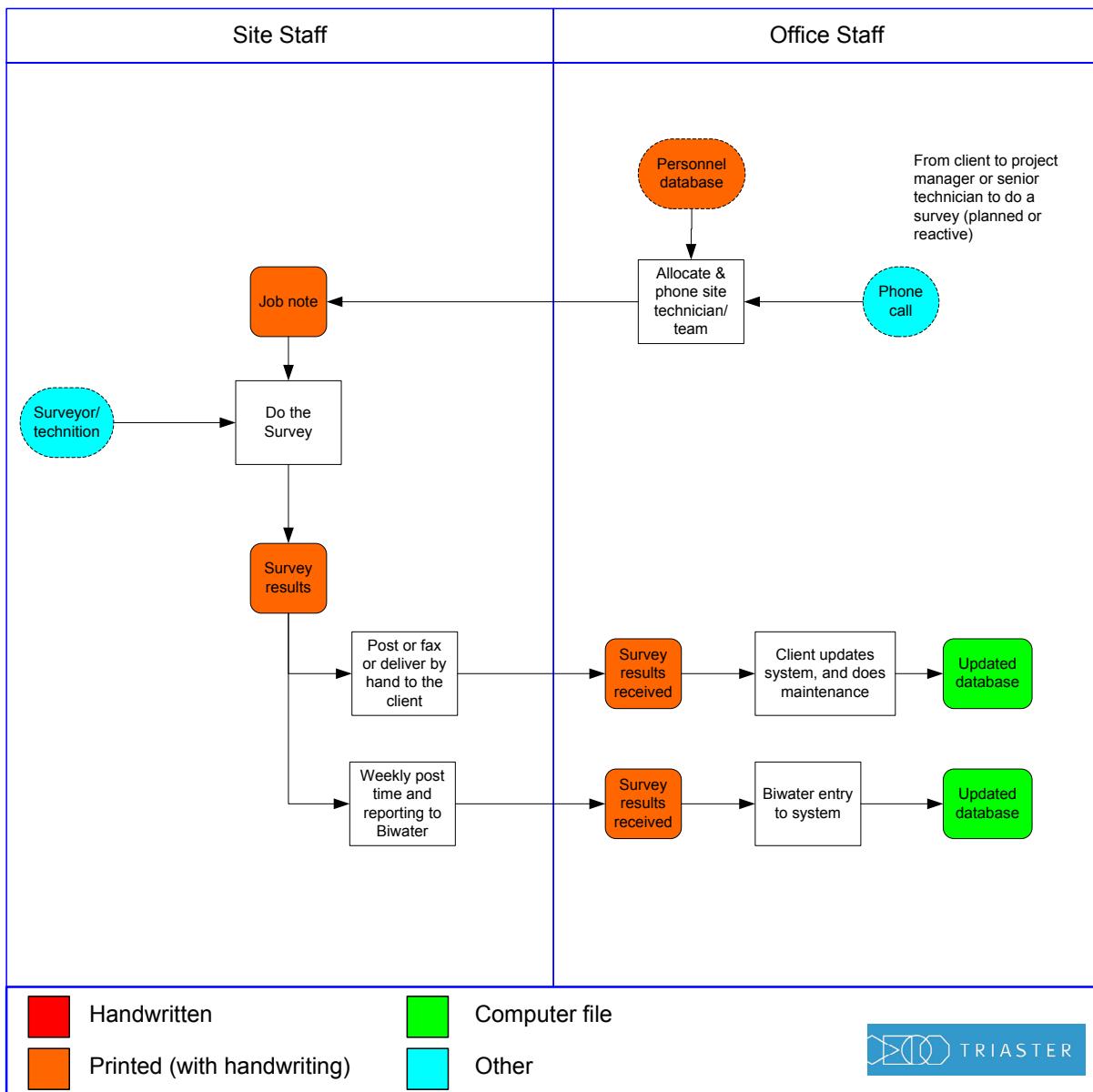
Costs

The tracking devices are a significant cost, this can be varied by buying different versions which are more or less accurate than the ones used by Biwater. A high proportion of the overall cost has been the time spent on the solution. For Biwater this cost will be recovered quickly and the advantages of the system will be increased by the addition of tablet computers and other software, planned for the near future.

Implementation Timescale

The main problem that Biwater have had with the implementation is the communication between the tracker boxes and the office software. System synchronisation to send data by mobile phone has been the major issue to be resolved for this project.

The full implementation has taken less than two years. Most of this period has been spent testing various methods of sending data to and from the vans.

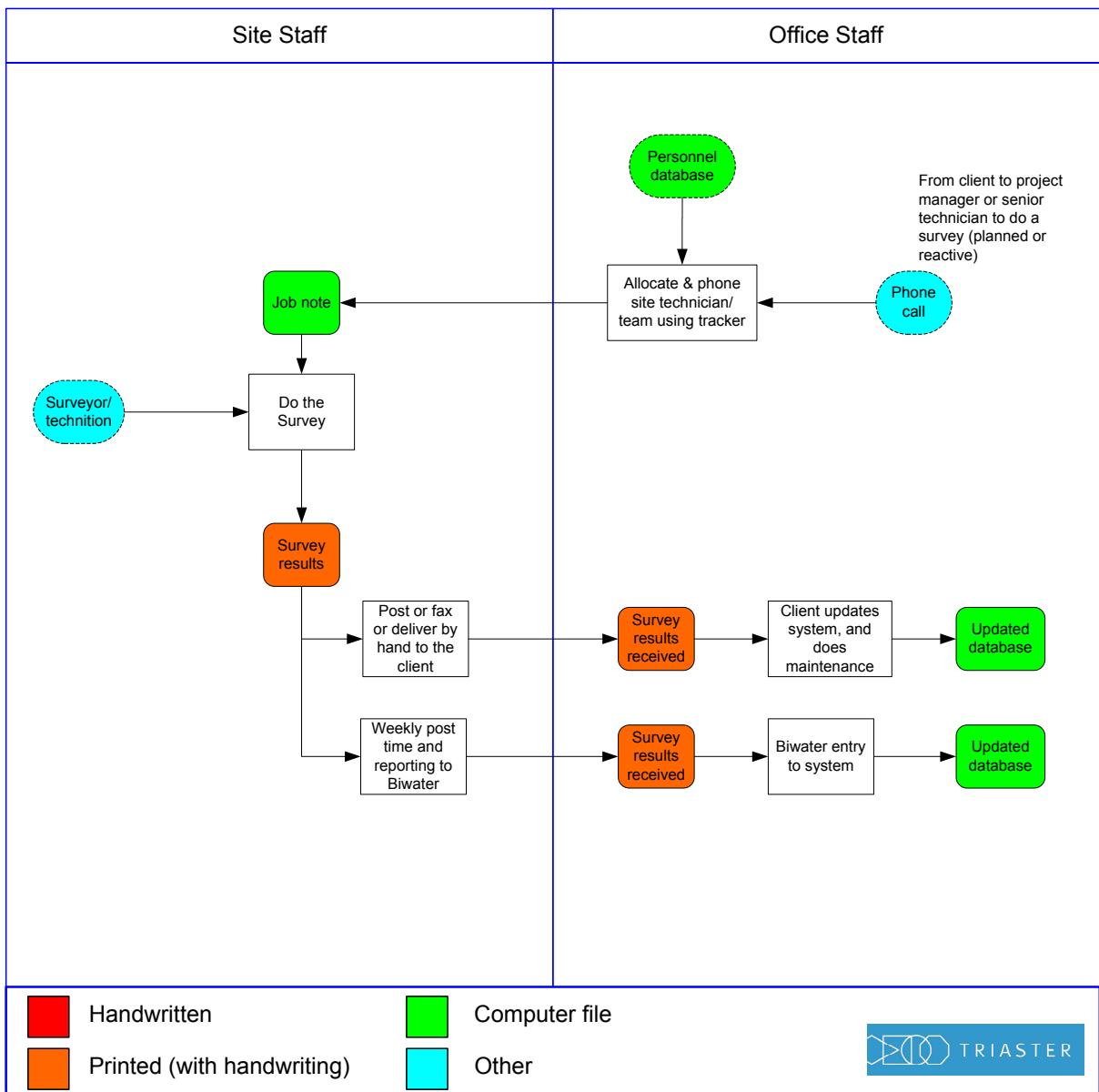


Original Business Process

Biwater teams generally work for one client and have a specific area to work in for that client. Apart from the planned work there are different priorities given to other urgent work that is phoned through by the client to the Biwater office. Depending on the priority given, the office will call the best team in the area with the survey details. Some jobs require completion within 3 hours, and the decision on who is the best team is up to the office staff judgement.

Teams then carry out the survey and send any information by post or fax, or it is handed directly to the client depending on the urgency. At the end of the week worksheets are sent to Biwater head office.



Case Study 4

New Business Process

Biwater teams generally work for one client and have a specific area to work in for that client. Apart from the planned work there are different priorities given to other urgent work that is phoned through by the client to the Biwater office. Depending on the priority given, the office will call the best team in the area with the survey details. Some jobs require completion within 3 hours, and the decision on who is the best team is easy as office staff can see exactly where teams are and how long they have been there. This logistical improvement means that significant time is saved and clients have reassurance of their service. Teams then carry out the survey and send any information by post or fax, or it is handed directly to the client depending on the urgency. At the end of the week worksheets are sent to Biwater head office. The planned introduction of tablet computers will enable information to be sent electronically from the field.



Lessons Learnt

People

Initially, there was some resistance to the system as several technicians felt that there was a "spy in the cab". Once the reasons why the trackers were being installed were explained, most of the resistance was alleviated. The need for the solution was mostly client driven, which helped dispel the idea that their own management were watching them.

When installing a process such as this, make sure that you have some in-house expertise for any novel technology that is used. There were some data transfer difficulties between the telecommunications systems/software. This specific technology is now more developed.

Process

The accurate knowledge of where the technicians are means that Biwater can give clients guarantees of location and good estimates of how long it will take to get to them.

Working more efficiently gives Biwater and clients options for working together more closely. In priority reactive cases, the clients can identify whose teams are closest and can possibly share some of the reactive leak detection and repair work.

It pays to check to see if your clients are developing their own solution that you will have to work with. Sometimes the suppliers or clients are larger and more advanced and therefore it is more efficient to make use of their systems or ensure your system is compatible. You need to be aware of this and ensure you have a flexible system.

Technology

The GPS technology is now well developed and available off-the-shelf. The communications part

was not as mature, had to be bespoke and had a few more bugs.

The routine reports are now fully automated and there is a larger variety of logistics data and reporting now available. This leads to more accurate and easy reporting of service levels and KPI's.

What Next?

Biwater are making plans to roll out the next generation of tracker to the whole fleet of approximately 150 vans.

There are many opportunities to add mapping and navigation systems to the van's GPS systems and optimise the logistics. Once the communication between the different systems is working smoothly it is planned to install tablet computers in the vehicles. These tablet computers will have navigation ('sat-nav' type applications), digital network maps, work-scheduling and e-mail systems installed on them. This will improve the reporting of the survey results and further improve the logistical efficiency of the fleet.

Details for further investigation

User:

Alasdair Harry, Biwater
[www.biwater.co.uk]

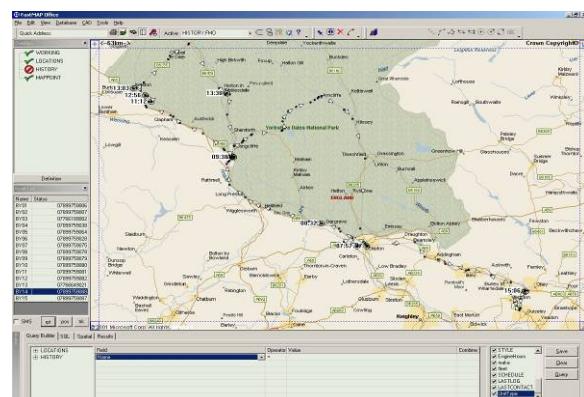
Software Providers:

Various, supplemented by some in-house development; details available from Alasdair Harry.

Hardware and Service provider:

Trimble
[www.trimble.com]

Technology Overview



Mobile computing device

The GPS tracker box is positioned in a discreet position in a vehicle and communicates through an antenna (combined GPS/GSM receiver) with the satellite network to find the global position. The information is then sent via the GSM mobile phone network. Trial installations of tablet computers in the van, to allow use of job scheduling and in-cab mapping, are indicating further benefits.

Software application

The software shows graphically, or in text reports, the information from the GPS boxes. It gives reports for each van for any specified time frame, with standard reports set for daily or weekly summaries. Microsoft MapPoint and FastMap Office are two of the applications already in use.

Communications infrastructure

A combined GPS/GSM aerial is mounted on the van roof. This acts as a communication device for the tracker box and receives positional information from the satellites. Once the box is installed in the vehicle the communication needs to be set-up between the box and the base station software. Currently data is sent via a GSM mobile phone data call, in the future it will be sent via a GPRS link along with other work information.

The COMIT Project

COMIT, Construction Opportunities for Mobile IT, is a two-year research and development project part-funded by the Department of Trade and Industry. Led by Arup, in partnership with BSRIA and Loughborough University, the project brings together representatives from construction, technology, research and dissemination organisations to facilitate the realisation of business benefits from the adoption of mobile information and communication technologies.

Key Objectives

- Creation and running of the COMIT community.
- Mapping of information and communication needs of point-of-activity workers.
- Production of case study material, including detailed factual business benefits and implementation guidance.
- Implementation of mobile IT on two demonstration projects, in order to evaluate the benefits and barriers successes and failures.
- Continuation of the development of community activities in conjunction with the ITCF.

COMIT Case Studies

This report provides an overview of the use of mobile communication technologies on a construction project. It is one of a series of case studies that have been conducted as part of the COMIT project to show real examples of implemented applications.

The case studies illustrate several mobile technologies and how the companies have improved work processes. An overview is given of vital information such as who championed the changes, how much they cost and what business improvements were gained. To gain a full insight, both the staff using the technologies and their managers were interviewed.

How do I find out more?

In addition to the contact details provided in this case study you can use the **Information hub** available on the COMIT website (www.comitproject.org.uk). The relevant details can be found by selecting:

Process	Asset management, monitoring operatives
User	Maintenance engineers, operatives
Software	Data capture
Hardware	GPRS tracker box
Infrastructure	GPRS/GSM

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