THE WATER MANAGEMENT INFORMATION SYSTEM

Buffalo City Municipality

Buffalo City Municipality has an extensive network of water reservoirs, supply mains, valves and pumps which provide over 650 000 citizens throughout the city with drinking water. Most network components in the densely populated urban core are over 50 years old, and large amounts of water are being lost due to insufficient maintenance of the system.

Such a network requires a Water Management Information System (WMIS) for asset control and monitoring, a maintenance and replacement programme, and water production, distribution and consumption management. The information generated by the WMIS informs decision making to ensure that a scarce and strained resource is used wisely in effective and efficient service provision.

Work on the WMIS Project started in 2004 with the aim to improve information management for efficient decision making by using a Water Management Information System to assist in the elimination of service backlogs, maintenance and upgrading of infrastructure.

Some components of the system are already in place, such as an extensive telemetry system in the urban core that provides information on reservoir levels and zone flows, but the system needs to be extended to provide sub-zone flows and to incorporate pressure measurements. The Water Branch is currently extending the system by implementing a Geographic Information System (GIS) to provide key operational information to management. The current water management system will be integrated with the GIS.

The current water loss of approximately 42% is being ad-

BUFFALO CITY WATER DIVISION OBJECTIVES

- Eliminate service backlogs via a prioritised basic services backlog programme
- Maintain, refurbish and upgrade infrastructure
- Expand services and provision of free basic water
- Contribute to economic development
- Manage water effectively to support revenue collection and the national objectives of the Department of Water Affairs and Forestry

MAIN ACTORS IN THE WATER MANAGEMENT INFORMATION SYSTEM PROJECT

- Buffalo City Municipality Water Branch
- Gävle Vatten
- Gävle Municipality

Mr Graham Cowley, Programme Manager at Water Supply Services in Buffalo City Municipality, shows how the WMIS can help to save large quantities of unaccounted water in the municipality.

dressed via proper management of the complete cycle of water supply, from raw water sources to the supply of potable water to consumers. A GIS was required to gather and communicate information efficiently.

This multi-disciplinary project involved information technology, project management, operations research and management and engineering planning. It involved developing a WMIS that would identify weaknesses in water provision, leaks needing repair and customer service problems. The project is an example of how information technology can make municipal services more efficient and customer friendly, save resources and reach more people more cost-effectively.

Additional equipment such as digital leak detectors with GPS is being acquired and the Water Branch is developing the system to record the incidence of pipe bursts. The current forecasting methodology will be replaced by a "data verification methodology" for capturing underground assets, and for re-engineering water services operational procedures.

The WMIS project was incorporated into the Buffalo City – Gävle (Sweden) municipal partnership programme in 2003 and has been the subject of reciprocal study visits.

The Water Services Development Plan, which deals with water and sanitation services, is a high priority in the Integrated Development Plan (IDP). Activities to date include:

- Investigation of current systems on the market
- WMIS tender preparation, adjudication and award
- WMIS implementation – contractual documentation and project implementation
- Twinning - establishing a working relationship with Gävle and applying for funding.

Project implementation focuses on asset and maintenance software to capture and verify data for the Water Division in conjunction with the WMIS, GIS and Asset Management System. The WMIS needs to be integrated, user-friendly, 'customisable', based on a relational database and include maintenance and support.

One of the most important results of improved operational efficiency is that more resources will be available for other council objectives, such as extending service delivery and improved affordability for the poor.

The system will make water provision more efficient, reduce the amount of water that is unaccounted for, and increase water revenue relative to expenditure. The more efficient the system, the

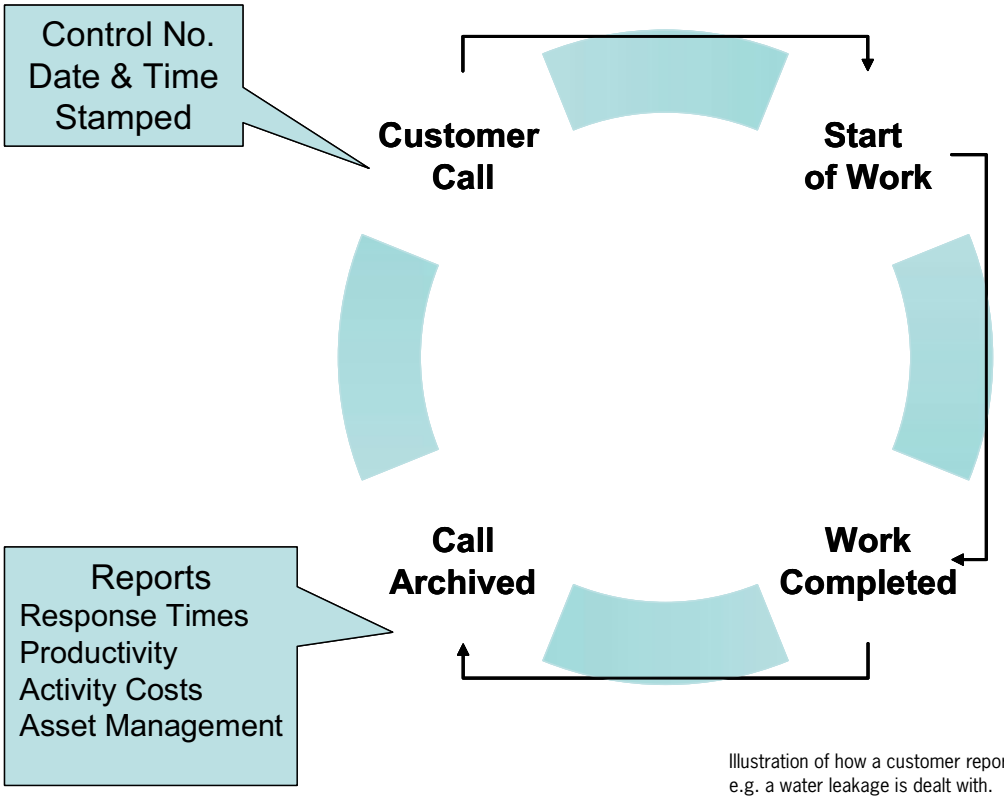

Illustration of how a customer report on e.g. a water leakage is dealt with.

more services can be extended to and improved for disadvantaged communities. The project also enables effective response to complaints from disadvantaged households.

Capacity development through the project

Approximately 100 staff from the municipality will be trained to manage WMIS, enter data and provide customer support. Customer education and the billing process will make more information available to consumers on their consumption patterns to improve awareness.

The project is highly technical and specialised, but the WMIS can provide information to politicians and staff in a useable form, enabling them to make better decisions in allocating scarce funds and resources for water provision.

Mr. Glynn Myer, engineer at Water Supply Services in Buffalo City Municiality explains that the system will increase the efficiency in water delivery, which will benefit disadvantaged communities such as Mdantsane.

The project enables:

- properly managed system maintenance, expansion and control
- increased revenue collection
- efficient tracking of water consumption
- ensuring that all water users are captured on the system
- improved customer services
- saving significantly on operating costs and capital expenditure
- effective demand management to optimise operational efficiency

The working relationship between Buffalo City and Gävle on the WMIS project has generated new solutions and mutual learning benefiting both municipalities.

As a direct result, the municipalities are ring-fencing Water and Wastewater, and Buffalo City now has a well integrated and managed GIS and related WMIS to optimise use of its assets. The project has further been extended to include sanitation services.

LESSONS LEARNED

The methods used and lessons learned from this project are being transferred to improve wastewater and sanitation services in Buffalo City, since the management changes, information system and control functions are similar.

Many water management challenges have turned out to be the same in Buffalo City and Gävle, and solutions in one city worked for the other in many cases. One conclusion is that projects involving complex new technologies benefit by technical assistance partnerships with expertise input.

Some of the major lessons learned are:

- Skills development is essential when introducing new technologies
- Municipalities should operate their own GIS and own their own data rather than being dependent on consultants
- A GIS needs to be integrated with the management information system
- Information technology can make municipal services more efficient and customer friendly, save resources and reach more people more cost-effectively.