

lessons series

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GETTING WATER ASSET MANAGEMENT RIGHT IN BUFFALO CITY



"Making knowledge work for us"

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OVERVIEW

Water and sanitation infrastructure is one of the most expensive assets that a municipality owns. Properly designed and well managed water and sanitation infrastructure supports social and economic stability, and has good environmental benefits such as the prevention of leakages, flooding and wastewater pollution. It is for these reasons that the Municipal Finance Management Act (MFMA) (Act 56 of 2003) requires municipalities to maintain and safeguard assets.



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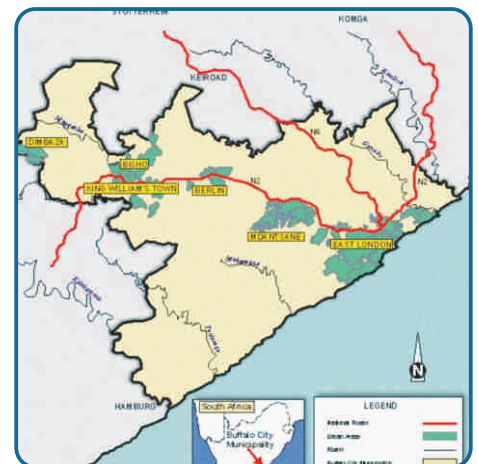
There are many negative impacts associated with poor asset management, the greatest of which is asset failure. Where assets fail, people are at risk of sickness, and even death. The environment is also at risk of pollution, and this has a negative impact on the economic growth. Repairs and replacement of assets are costly, and negatively impact on municipal budgets since failure cannot be predicted. While maintenance of assets involves making provision for ongoing costs, this is on a planned basis, and tends to limit failure and unpredicted expenditure.

It is essential that local government councillors and officials understand the basic issues pertaining to effective asset management. WIN-SA, in its mandate to promote knowledge and information sharing on water and sanitation services delivery, interviewed the General Manager: Water, Waste Water and Scientific Services of the Buffalo City Municipality, Mr Graham Cowley. The aim was to document the experiences of Buffalo City Municipality in asset management for wider dissemination and sharing with municipalities and other water sector partners.

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THE MUNICIPALITY

Buffalo City, located in the Eastern Cape, grew out of four Transitional Local Councils (TLCs) in 2000. Each of these entities were previously water services providers in their own right. At the time of amalgamation Amatola Water and the Department of Water Affairs and Forestry (DWAF) were responsible for providing bulk water services in the TLCs. The East London TLC provided water to East London, Beacon Bay and Gonubie from its Umzoniana Water Treatment Works. The King William's Town TLC obtained water from Maden Dam, treated at its own Water Treatment Works. It supplemented raw water from the Rooikrantz Dam, and potable water from the Laing Dam, which were under the control of DWAF. Buffalo City has incorporated most of the water and sanitation installations located in the ex-TLC areas. The Municipality currently includes large urban industrial areas, small towns, scattered rural settlements and commercial farms.



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BACKGROUND

3.1 History of water services provision

Prior to the establishment of Buffalo City, the four TLCs responsible for water services provision used a manual system for provisioning and asset management. As a newly established trading service Buffalo City assumed responsibility for water and sanitation in all four areas. As a result it became

the custodian of records, data and systems in various fragmented forms that were geographically dispersed and, in many instances, non-operable. Standards differed, asset information was limited, and work practices and costing varied considerably. Planned maintenance was limited and more reactive than planned. One of the consequences of this was that management and decision making was reliant on the experience of operators rather than being factually informed.

These manual systems may have been effective in the smaller supply areas, but it was not feasible to continue under the consolidated Buffalo City Municipality. In the early stages difficulties were experienced in combining towns and rural areas due to the lack of uniformity in standards, availability of information on assets and the levels and types of service being provided.

Hence a more efficient system was necessary to:

- Integrate the four supply areas.
- Incorporate the associated assets and staff.
- Operate and maintain effective water and sanitation services provision throughout the new supply area.

3.2 The vision

A long term vision for efficient water provision was developed among a dedicated management team in Buffalo City. This vision, allied to a 'twinning' relationship with Gävle Kommun, a municipality in Sweden, led to political, technical and financial support for the establishment of a Water Management Information System (WMIS) in Buffalo City. A funding application to the value of R1.5 million was submitted to and approved by SIDA donor agency in 2003. This allowed for an investigation into the software systems available on the market, and the appointment of an appropriate service provider. The aim was for the service provider to work closely with officials in the development of an appropriate system to achieve effective asset management in Buffalo City.

3.3 Objective

The main objective was to implement a centrally based and controlled WMIS. This was undertaken with the view to managing data collection and capturing, and to store that data on a centrally based electronic system.

Furthermore, the stored data had to be converted into usable information in a variety of formats to enable and inform:

- Management of all activities in the Water, Waste Water and Scientific Services Division.
- The introduction of effective and sustainable asset maintenance.
- Forward planning for provision of sustainable water services.
- Management and reduction of non-revenue water.
- Production of accurate and informed reports at various levels of management.
- Provision of accurate information for development of Master Plans, the water services development plan (WSDP), and pertinent sections of the integrated development plan (IDP).

3.4 Challenges

Mr Cowley and his team identified a number of challenges to asset management and water services provision which included:

Human resources and training

Amalgamating previously separate municipal entities involved the inclusion of personnel from a wide range of backgrounds. These staff had to adapt to new operational systems as the WMIS evolved. This has included training in the use of the automated job card system, stores, management information etc. Continual training on asset maintenance forms an integral part of capacity building in Buffalo City.

Historical records and systems

Locating and recording type and condition of assets in the amalgamation process have proven to be major and ongoing challenges which can only be achieved over an extended period of time due to poor records and loss of historical memory of systems. Amalgamation of outdated management systems was a challenge .

Understanding and acceptance of change

Creating awareness among councillors and managers about the value and importance of transforming water services management from a manual to an automated system.

Funding

Securing the necessary funding to set up the WMIS and to operate and maintain the system in an environment where little was known about integrated management systems.

Drive and commitment

Establishing a committed core management team within the Municipality to drive the transformation process.

Appropriate IT support

Selecting asset management software packages best suited to local conditions and procuring an appropriate information technology (IT) service provider with knowledge of water and sanitation services provision.

Strategic phased approach

Avoiding the temptation to tackle all aspects of the WMIS simultaneously and rather pursue a strategic approach involving the progressive development of different aspects of the system.



Delivery problems the WMIS seeks to address

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ACHIEVING EFFECTIVE ASSET MANAGEMENT

4.1 The role of asset management in water services provision

Mr Cowley outlined the need for a uniform system of asset management within the Municipality. This need was identified by managers in the water sector. This was required to enable the Municipality to achieve MFMA compliance and the creation of a full maintenance plan. "To move away from the old manual paper based system required political and financial support in Municipal structures," reported Mr Cowley. This was achieved by initiating a programme of communications among councillors, and was undertaken by key staff with a vision for the future of water services provision in the Municipality.

4.2 Overview of the Water Management Information System

An IT service provider was engaged to develop the comprehensive WMIS to support appropriate operation and maintenance of assets. It was recognized at the outset that it would be a slow process

involving the inclusion of assets from all previous supply areas into one database. Once complete, the database would form the basis of the Municipal Information Management System.

Treatment plants, water, sanitation and meter assets were the first components of the new system included in the database. A number of other components (stores, water quality, remote sensing etc) have been added progressively to the system since it was initially developed. This has resulted in the development and use by Buffalo City of a comprehensive water asset and project management system.

Inclusion of assets into the database is an ongoing process as each new area is added to the system. The *operational* aspects of the system are job card 'driven' with details being recorded in 'tick boxes' on each electronic job card. These are completed on computer by Foremen at the end of each job. Job cards include location, time taken to complete the job, staff involved and materials used. The system incorporates stock located in the stores and stock prices. This is also known as 'Storeman' as an abbreviation for store management. This allows for activity based costing, per job, to take place as each job card is completed. Where components on a job have to be repaired or manufactured (e.g. pump repairs) then the workshop staff are involved and their time, materials and costs have to be included on the job cards.

Mr Shaun Kumm, who is responsible for plant management (abbreviation is 'Plantman') in Buffalo City, says that effective plant *maintenance* is dependent upon establishing an up to date asset register, maintenance schedule and the use of telemetry to monitor assets. Telemetry involves reading of meters and other measuring instruments on bulk infrastructure using remote sensing equipment.

As noted above, maintenance is undertaken through electronic job cards. These are completed at the workshops or by service providers, depending on where the maintenance is undertaken.

Telemetry is interfaced with 'Plantman' (the plant management system). This allows an ongoing check up on maintenance scheduling every 30 days. 'Storeman' is linked to 'Plantman' and job cards. The aim is to enable Millwrights in the workshops, and service providers (where outsourced) to include materials and spares on job cards for activity based costing purposes. Once each maintenance job is completed it is recorded on the job card and set aside from active job cards in the 'Plantman' system. These records are then used to create reports for monitoring of maintenance and formulate future programmes and budgets. Reports can be prepared in a variety of formats depending upon requirements by management.

Inclusion of stores into WMIS allows for tracking the movement of materials through stores. It also allows for an automatic stock take. This, in turn, enables the ordering of critical spares which are not normally available at commercial outlets (e.g. pump impellers, pressure valves, seals etc).



Stores



Workshop repairs



The last major element of WMIS is meters. Mr Mario Loxton, from the Buffalo City meters section, indicated that meters form a critical part of assets in water and sanitation services provision. They

are important for cost recovery and for monitoring purposes. Meters have a life expectancy after which they need to be replaced to ensure accuracy of readings. Workshops in each of the three District depots have test rigs and test batches of meters in different supply areas depending upon age. Where faulty, they are included in the meter replacement programme.

Monitoring of bulk meters (water) on reservoirs and flow meters (sewer) on bulk pipelines is undertaken through telemetry. In comparison, small meter reading on domestic and commercial properties is undertaken by meter readers in the Treasury division of the Municipality using hand held devices.

4.3 Additional elements of WMIS

Capacity transfer

A key consideration in the commissioning of WMIS was the capacitation of staff. This was essential to enable them to operate the system as it evolved. In the establishment of Buffalo City, water and sanitation staff were transferred from the ex-TLCs, Amatola Water and DWAF. The staff were all familiar with the manual job card systems, and thus required training to enable them to use the automated system. Similarly, management in water and sanitation services provision required training to enable them to use the system to monitor performance, costs, turn around times and adjust management systems accordingly. Stores were also included into the WMIS in the three District depots in the Municipality. Stores staff in all depots required training to enable them to record and manage stock on a digital basis through the 'Storeman' system.

Customer care

Buffalo City is divided into three Districts for water and sanitation services provision, and each District has its own Manager. The Districts all have Service Request Centres which operate during working hours. The Fire Department takes responsibility for the after hours customer care function. One of the improvements being considered in Buffalo City is the establishment of a 24 hour call centre for water and sanitation at its Chiselhurst (Coastal District) Depot to service all three Districts after hours.

Service Request Centre staff work closely with repair teams on a fully automated system where assets are all geo-referenced (meaning that they can be located spatially by staff on a map). Each complaint is allocated a unique number which allows for progress tracking. Foremen use map books produced on the Geographical Information System (GIS) by the GIS Section to locate and geo-reference assets. Linking the call centres into the WMIS network has allowed for improved turn around times on the repairs and maintenance of assets. Illustrative performance measures in water services provision have been developed at Buffalo City as a basis for performance benchmarking.



Call Centre

Mapping of assets

The locations of all plant, pipe segments and associated network items are captured on the WMIS mapping system (ARCINFO). The location of each maintenance occurrence is recorded on job cards and captured in the system. This allows for the establishment of burst patterns in the water networks and blockages in the sewer networks. This in turn informs age and condition of pipelines, and feeds into replacement programmes and Municipal budgets.

Performance Measure	
Emergency break	30 min - 2 hours
Minor leak	1 day - 3 days
Written complaint	5 days - 10 days
Notification of planned shutdown	4 hours - 24 hours
Availability of service	99.5% - 99.9%
Maximum duration of disruption	4 hours - 8 hours
Unaccounted for water	10% - 20%

In future the mapping system will be digitally linked with job cards and hand held digital devices to enable teams to locate assets off the database, and input information directly into the system.

A further application of the mapping system is that it allows for the tracking of capital investment programmes in capital roll out. This applies both in backlog eradication and in asset replacement programmes.

Financing asset management

The start-up funding for WMIS was provided by the SIDA donor agency amounting to R1.5 million. This was followed by R6.8 million capital contribution by Buffalo City, with an annual operating and maintenance budget of R1.5 million which is serviced by the Municipality. Accessing this funding was premised on mobilizing internal political and management support for the project. This, allied to a twinning relationship with Gävle Kommun in Sweden gave rise to both external donor support and the internal budgeting of funding for the project.

Forward Planning

The WMIS suite was designed to incorporate future infrastructure requirements at two levels. The first involves making provision for demands for infrastructure associated with new capital developments in the Municipal area. This is achieved through interfacing with Development Planning in the Municipality on the basis of a review of the IDP and associated sector plans. The second provision in WMIS is planning for asset renewal. This forms an integral part of WMIS where an asset requiring replacement towards the end of its normal lifespan is included in the budgeting process.

LESSONS

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5.1 Key Lessons

The key lessons emerging from Buffalo City's asset management experience include:

- Asset management forms an integral part of the wider services provisioning function, and

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cannot be dealt with as a stand alone function. This has been undertaken through the WMIS in Buffalo City.

- The quality of water and sanitation services provision is closely tied up with and dependent on effective asset management in a supply area.
- Recognition of the importance of political commitment to transformation of outdated asset management and services provisioning systems by councillors and managers is critical to realizing visions for change. Political commitment is essential to instituting effective asset management in municipalities.
- Major value can be added through twinning programmes where councillors, managers and technical staff are able to see the benefits of migrating to a new, more comprehensive management system
- The importance of a dedicated core team prepared to work constantly at change management and improving the quality of water and sanitation services provision inclusive of asset management is essential to the success of such initiatives.
- Preparedness of staff to undergo significant initial and continuing 'hands on' training is an important pre-condition to enable them to effectively operate and 'grow' in the new systems as they evolve.
- Making provision for the advancement of exceptional staff and staff who have consistently performed well in the new environment is a critical success factor.
- Ensuring appointment of the correct IT service provider to develop and adapt the WMIS system was critical in achieving the final outcome.
- Implementation of an effective WMIS should follow a phased approach inclusive of the following key elements:
 - Communications
 - Hardware and network establishment
 - Software and basic training of staff
 - Implementation of management software
 - Establishment of a comprehensive customer care system
 - Automation of job cards and training of staff in use of the system
 - Effective management
 - Ongoing development and maintenance of the system
 - Costs and financing mechanisms.

5.2 Support for Municipalities

Mr Cowley has indicated that the team in Buffalo City would be prepared to provide support to other municipalities wishing to establish an integrated water and sanitation management system. He is of the view that other municipalities wishing to embark on this 'road' could potentially be 'up and running' in a shorter period of time than Buffalo City, dependent upon size and complexity of the water sector in these municipalities.

Mr Cowley notes that, "Owing to the success that Buffalo City has experienced in integrated water management, our Electricity Department has decided to convert to this system in order to provide a more cost efficient service to the consumers of the Municipality."

FOR MORE INFORMATION CONTACT

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FOR YOUR NOTES

FOR YOUR NOTES



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Our mission is to ensure the body of knowledge in the sector is well managed, readily accessible and applied, leading to improved decision-making and performance, especially of local government.

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