

# Implementation of a Demand Management System in Port Elizabeth, South Africa



**Implementation of the EDAMS Demand Management System by the city of Port Elizabeth (Nelson Mandela Bay Metropolis) has created an integrated environment for the planning, implementation and monitoring of conservation and infrastructure programs. The system acts as a bridge across the great divide that separates the Council's commercial and technical functions. It has facilitated the merging of town commercial and network data with engineering standards and town planning data, and provides the demand models forming the basis of interactive and dynamic conservation and master planning.**

## Port Elizabeth

Port Elizabeth is located on the south-eastern coast of South Africa and is the fifth largest city in population and the second largest in terms of area it covers. The Metropolitan Council is responsible for both municipal services as well as for Utility services. It has recently implemented an integrated Demand Management System to help the engineering department embark on a conservation planning program for reducing non-revenue water and a sensible infrastructure upgrading program to improve service delivery.

The system was implemented by EDAMS Technology's South African regional office and is comprised by the integrated EDAMS Demand Management, EDAMS Assets Management and EDAMS Network Analysis sub-systems.

## The Water supply system

Total production is 70,000 Ml/year, unaccounted for water approximately 30% of production and non-revenue water about 68% of production due to the low debt recovery (42%). Approximately 18,000 properties are served by public

taps, whilst a large number of informal settlements exist with about 300,000 people served from isolated connections. At the commencement of the project a computerised billing system and GIS were in use at the council.

## Implementing the System

Implementation of such an integrated Demand Management system required cutting across interdepartmental boundaries and integration of all forms of relevant data. This integrated approach not only facilitated the seamless amalgamation of different management functions in the Utility, but also improved general data integrity and quality. The implementation of the system was executed in six steps.

## Data Modelling

An accurate network model of the extensive distribution network of more than 3,500 km was built using the EDAMS Network Asset Management system.

The EDAMS Demand Management system was used to link into the existing billing system and related connections to the town planning data and to the network.

## Commercial Data Analysis

Utilising a holistic and intelligent methodology commercial data were evaluated, validated and reconciled with field surveys over a period of 12 months. The initial fourteen thousand discrepancies identified were reduced to less than three hundred through a systematic approach of identifying and correcting the problems. During the process many problems were also identified with the town planning data.

## Technical Data Analysis

Network data quality was improved through network field surveys guided by the data evaluation routines of the model identifying suspect areas through connectivity and zone analysis. Problem areas were highlighted and subsequently investigated out in the field. Through the field surveys a rehabilitation plan was also drawn up addressing problem areas. The system was subsequently used to rezone the network into 90 Districts with only 20 of the existing districts meeting the zoning requirements of water balancing and equitable pressure distribution.

## Demand Analysis

Integration at billing and GIS level ensured the use of live, current data, including consumption and bulk supply meter readings. This made it possible to link actual consumption to discrete network elements so as to generate the design flows necessary for demand analysis, demand forecasts and monthly and real-time mass balancing. Demand Analysis included consumption analysis, demand standard evaluation, generation of design flows for network analysis and capacity sizing of major components.

## Conservation Planning

The system is used to address the most critical facets of conservation planning – such as water system audits, unaccounted for water, leakage management, cost analysis and system-wide pressure management. The system is currently used to assist in the formulation of various conservation programs and in monitoring performance on a district level.

## Infrastructure Planning

As a next step the system will be used to address network optimisation, including minor upgrades for maximising the capacity of the current network and network upgrading for improving service delivery to un-served consumers and consumers receiving water from public taps

## An ambitious program

The Nelson Mandela Metropolitan Council has embarked in an ambitious exercise to improve its performance through the reduction of non-revenue water and through the smart deployment of funds for expansion. Implementation of the Demand Management system formed a most valuable tool in serving this purpose.

