

E-BOOK

TECHNOLOGY-ENABLED MAINTENANCE MANAGEMENT IN TIMES OF PROMISE AND PERIL

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SUMMARY

The future of the city is defined by inequality, vulnerability and risk. In a context of population growth, urbanisation and aging infrastructure, the principles of infrastructure asset management must be fused with technological innovation to enable organisations to turn great peril into promise. In this eBook we emphasise the need for a greater focus on the periodic maintenance of public infrastructure – i.e. maintenance management - to bolster the ability of cities to meet the needs of growing populations in uncertain times.

We start off by outlining the relationship between infrastructure and human security; a problematic relationship due to a global infrastructure gap that sees some populations being more vulnerable than others. Contrary to popular practice, a key solution to bridging this gap is not more capital investment in new infrastructure, but rather a holistic approach to infrastructure asset management that places a greater focus on maintenance management.

The eBook proceeds to offer a solution to current maintenance obstacles in the form of the IMQS Maintenance Management Module. The software solution enables more efficient planning and management of engineering and financial components of operations and maintenance. It does so by harnessing cutting edge technology to support proactive and cost-effective maintenance practices. Two short case studies serve to briefly illustrate how IMQS has gone about working with city governments in South Africa to build its products in order for clients to achieve smarter maintenance management systems.

This book is of value to city managers as well as C-suit executives who are looking for ways to make greater inroads into solving service deliver challenges through comprehensive project control and financial management. It offers its reader some insight into the current challenges faced by city governments in their endeavor to meet the needs of growing populations and, moreover, presents a tangible solution to overcome challenges by empowering people through technology.

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INFRASTRUCTURE AND HUMAN SECURITY

In South Africa, people take to the streets every day in “service delivery protests”. They are intimately aware of the relationship between city infrastructure and basic socio-economic security. They are willing to put their lives on the line to be heard and to fight for what they believe to be a human right – the right to basic services supported by working infrastructure.

The view that many people only start to take note of infrastructure when it fails, serves to accentuate our reactive relationship with city infrastructure. Infrastructure failure means different things to different people, depending on their socio-economic vulnerability. For the more fortunate, infrastructure failure translates into squandered taxes. For the most vulnerable, it could mean the difference between a newborn child dying of a waterborne disease or not.

When one considers the relationship between infrastructure and human security, the global numbers are shocking:

- An estimated 746 million¹ people live in extreme poverty
- 1 billion² people lack access to safe water
- Nearly 1.1 billion³ people lack access to electricity
- A woman will walk an average of 3.7 miles⁴ (55 football fields) every day to collect water
- 1.5% of home-births⁵ involve safe water, proper sanitation and hygiene
- 1 child dies every single minute⁶ from diarrheal disease caused by contaminated water and poor sanitation (more deaths than HIV/AIDS, tuberculosis and malaria combined)
- 1 in 5 infants die⁷ in their first month due to lack of clean water in unsanitary environments

1 General Assembly of the United Nations. 2017. “Challenges of Infrastructure Investments and the Role of MDBs” Statement delivered by Mr. Peter Thomson, President of the 71st Session of the General Assembly, at the Global Infrastructure Forum. Online: <https://www.un.org/pga/71/2017/04/22/2017-global-infrastructure-forum-challenges-of-infrastructure-investments-and-the-role-of-mdb/>.

2 Ibid.

3 Ibid.

4 OneDrop. 2017. Campaign Facts. Online: <https://www.onedrop.org/en/campaign/#campaign-facts>.

5 Ibid.

6 Ibid.

7 Ibid.



It is vital to put infrastructure in this global context of inequality, vulnerability and risk. Across the globe, population growth, rapid urbanisation, aging infrastructure and constrained public budgets are placing ever-greater demands on city governments.

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1. General Assembly of the United Nations. 2017. "Challenges of Infrastructure Investments and the Role of MDBs". Statement delivered by Mr. Peter Thomson, President of the 71st Session of the General Assembly, at the Global Infrastructure Forum. Online: <https://www.un.org/pga/71/2017/04/22/2017-global-infrastructure-forum-challenges-of-infrastructure-investments-and-the-role-of-mdbs/>.
2. OneDrop. 2017. Campaign Facts. Online: <https://www.onedrop.org/en/campaign/#campaign-facts>.

INFRASTRUCTURE MAINTENANCE INVESTMENT

As noted by Peter Thomson⁸, President of the 71st Session of the General Assembly, at the 2017 Global Infrastructure Forum:

Investment in sustainable and resilient infrastructure is fundamental to achieving long-term sustainable economic growth ... [i]n short, improving the livelihoods of those in greatest need.

Infrastructure lies at the base of achieving the Sustainable Development Goals; however, the global infrastructure gap⁹ is a pressing issue. The gap was estimated to be around US\$1 trillion a year in 2014. At the same time, annual global demand lay at US\$3.7 trillion, while investment lagged behind at only US\$ 2.7 trillion.

Infrastructure investment more often than not translates into funding expensive new capital projects. However, constraints on public budgets, inadequate project implementation and corruption negatively impact new ventures, with dire consequences for vulnerable populations. This political bias towards funding new assets results in a neglect of maintenance and asset resilience, which leads to unnecessary user costs, as well as negative environmental and social externalities.

In uncertain economic times, according to the World Economic Forum¹⁰, authorities need to make the most of their existing asset base to increase asset productivity and longevity. In other words, the sustainable approach in the current economic climate would be to invest time and money into optimising existing infrastructure assets through effective maintenance management.

⁸ General Assembly of the United Nations. 2017. "Challenges of Infrastructure Investments and the Role of MDBs". Statement delivered by Mr. Peter Thomson, President of the 71st Session of the General Assembly, at the Global Infrastructure Forum. Online: <https://www.un.org/pga/71/2017/04/22/2017-global-infrastructure-forum-challenges-of-infrastructure-investments-and-the-role-of-mdbs/>.

⁹ Woetzel, J., Garemo, N., Mischke, J., Hjerpe, M., and Palter, R. 2016. Bridging Global Infrastructure Gaps. Report: McKinsey Global Institute. Online: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps>.

¹⁰ World Economic Forum. 2014. Strategic Infrastructure : Steps to Operate and Maintain Infrastructure Efficiently and Effectively. http://www3.weforum.org/docs/WEF_IU_StrategicInfrastructureSteps_Report_2014.pdf.



THE DANGER OF NEGLECTING MAINTENANCE.

The authors of Strategic Infrastructure: Steps to Operate and Maintain Infrastructure Efficiently and Effectively¹¹, maintain that authorities need to make the most of their existing asset base to increase asset productivity and longevity. As mentioned before, the existing political bias towards funding new assets results in:

- Neglect of maintenance and asset resilience
- Unnecessary user costs
- Negative environmental and social externalities

The GAC Infrastructure Chair and Managing Director of the European Bank for Reconstruction, Thomas Maier, emphasises the need for cities to harness the economic value locked away in their existing asset base. According to Maier, “O&M is part and parcel of high-quality service orientation for users” that “drives their willingness to pay for services and thus underpins funding sustainability”. Moreover, it is imperative to extract this value over the entire planned life of an asset.

In a bid towards more holistic infrastructure lifecycle asset management, the WEF report highlights three broad strategies that enable a sustainable maintenance environment:

1. INCREASE THE UTILITY OF INFRASTRUCTURE:

- Apply demand side management
- Reduce downtime
- Apply a customer-centric approach
- Use smart technologies to enhance user experience and refine asset performance

2. DECREASE THE TOTAL COSTS OF INFRASTRUCTURE:

- Implement lean automated processes
- Optimise procurement and outsourcing
- Conceptualise and embed sustainability into routine operations
- Enhance stakeholder communication and cooperation

¹¹ Woetzel, J., Garemo, N., Mischke, J., Hjerpe, M., and Palter, R. 2016. Bridging Global Infrastructure Gaps. Report: Mckinsey Global Institute. Online: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps>.

3. INCREASE VALUE OF INFRASTRUCTURE OVER ITS LIFETIME:

- Invest in preventative and predictive maintenance
- Control excessive asset consumption and stress
- Enhance disaster resilience
- Prioritise life-cycle management approaches
- Enhance efficiency of project delivery

In times of uncertainty, innovation and technology can support more efficient and effective asset management to turn risk into opportunity.

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1. General Assembly of the United Nations. 2017. "Challenges of Infrastructure Investments and the Role of MDBs". Statement delivered by Mr. Peter Thomson, President of the 71st Session of the General Assembly, at the Global Infrastructure Forum. Online: <https://www.un.org/pga/71/2017/04/22/2017-global-infrastructure-forum-challenges-of-infrastructure-investments-and-the-role-of-mdbs/>.
2. Woetzel, J., Garemo, N., Mischke, J., Hjerpe, M., and Palter, R. 2016. Bridging Global Infrastructure Gaps. Report: McKinsey Global Institute. Online: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps>.
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IMQS'S MAINTENANCE MANAGEMENT SOLUTION

Municipal engineers are responsible for the periodic implementation of normal, generally minor, actions that ensure longevity of infrastructure assets in line with their design and operational requirements –i.e. maintenance. The efficient management of this maintenance is a crucial component of successful infrastructure asset lifecycle management. Well-maintained infrastructure serves consumer needs and underpins economic production, employment, taxes and rates.

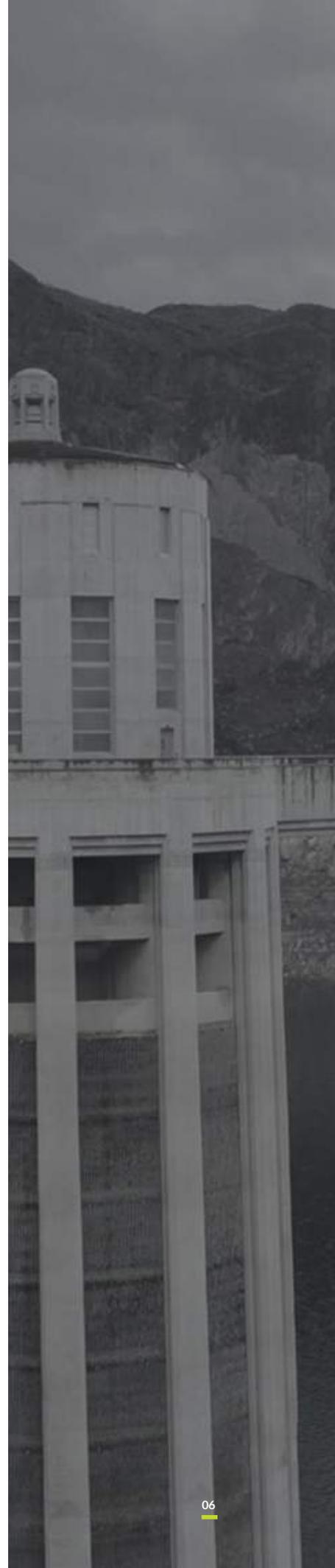
Rapid urbanisation and population growth is placing ever-greater pressures on city infrastructure and the engineers tasked with managing these assets in cash-strapped contexts. The need for systematic maintenance based on accurate and informed decision making is imperative as without it:

- Assets are allowed to run to failure
- Important capital is wasted on continuously providing new assets
- Faults are precipitated and breakdowns hastened
- Service delivery is undermined and backlogs increase

In this complex environment, how do you make the right decisions about corrective and preventative interventions, manage stocks and work force, or more effectively schedule maintenance according to need?

IMQS Software helps overcome key Maintenance Management challenges with a geospatial, GRAP-17 compliant Maintenance Management software package. The infrastructure-management-specific software has been developed to make the every-day tasks of municipal engineers easier. From incident logging and maintenance scheduling to managing resources, time and cost, IMQS has packaged Maintenance Management into one system that links directly to a municipality's Asset Register.

IMQS integrates, automates and unifies all maintenance-related data sources, processes, and reporting, presenting information in different views on an intuitive GIS Web-interface. IMQS has packaged Maintenance Management into one system that can link directly to an Asset Register.



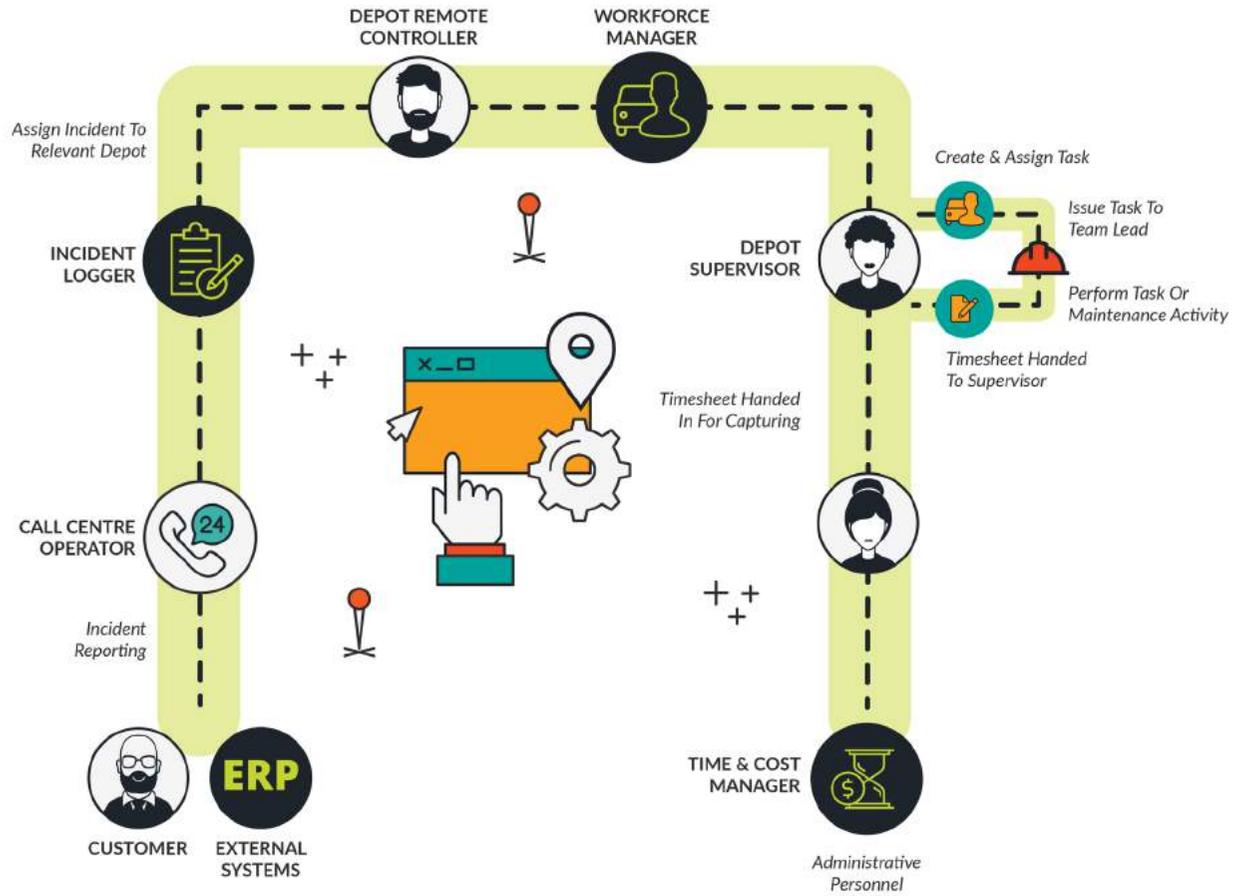


Figure 1: Integrated Maintenance Management process diagram

SOLUTION SUB-MODULES.

IMQS Maintenance Management Module consists of sub-modules that enable municipalities to overcome key maintenance lifecycle management challenges.



Figure 2: IMQS Maintenance Management sub-modules

1. INCIDENT LOGGER

An incident logger allows citizens to easily alert the municipal call centre to an incident such as a burst water pipe on a stand or street in the municipal bounds. The sub-module is an intricate component in the municipal system that empowers citizens to play an active role in their communities and ensure that transparent and good governance practices are met. Incident reporting is made efficient and transparent by automating broader processes and displaying centralised information geographically.

- A report is generated
- The incident is logged via the call centre and linked to an existing asset component in the GIS-referenced IMQS system
- The appropriate municipal authorities can view the status and authorisation history of outgoing work-orders, see what resource has been assigned to the job, and effortlessly print job cards



Figure 3: Geographically enabled incident logger

2. RESOURCE MANAGER

The Maintenance Management Modules fulfils the need for financial transparency and accountability on the Local Government level by seamlessly integrating with a municipality's preferred Financial ERP system.

The Resource Manager sub-module allows the municipality to account for all resources utilized within the Maintenance Management system to maintain:

- Employee, fleet, material and equipment lists
- Tariffs and standard-time programmes for their employees

Fleet number	Date of first registr...	Engine kilowatt	Region	Replacement amou...	Last User	Tare Mass	Last modified date	Budget	Description	Last kr
69/8/5	2/01/2003	0	51	0	1002067	0	10/02/2009	0	NISSAN CABSTAR 4...	1654
69/8/6	2/01/2003	0	58	0	1000284	0	19/01/2015	0	NISSAN CABSTAR 4...	1327
69/1243P		0	51	0		0	25/10/2012	0	NISSAN NP 300	6314
69/625P		0	52	0	1000296	0	20/03/2013	0	TOYOTA DOUBLECL...	5876
69/982W		0	52	0	1002052	0	17/04/2013	0	TOYOTA HILUX DO...	7328
69/218M		0	51	0	1002106	0	18/05/2013	0	TOYOTA D4D	6654
69/212R		0	51	0	1001915	0	17/05/2013	0	TOYOTA D4D	5956
69/41PP		0	51	0	1001860	0	28/05/2013	0	TOYOTA D4D	5374
69/138L		0	51	0	1001604	0	24/05/2013	0	TOYOTA D4D	6467
69/526GP		0	51	0	1002583	0	4/07/2014	0	TOYOTA HILUX 5IN...	8018
69/898GP		0	51	0	1001626	0	4/07/2014	0	NISSAN NP 300	8136
7ef0d9d7-fca5-9c8...		0	0	0		0	25/11/2013			0
11441728		0	57	0	1002025	0	25/11/2013	0	FORD RANGER DO...	7216
11441726		0	57	0	1001937	0	8/08/2014	0	FORD RANGER DO...	5057
11441723		0	57	0	1001933	0	8/08/2014	0	FORD RANGER DO...	8986
11441724		0	57	0	1001937	0	8/08/2014	0	FORD RANGER DO...	6176
11441725		0	57	0		0	8/08/2014	0	FORD RANGER DO...	0

Figure 4: Resource Manager sub-module

3. TIME & COST

The Time and Cost sub-module provides municipal managers the ability to automate time sheets as well as calculate overtime and cost for all skilled and unskilled labourers. Overtime and short-time reports can be exported to the municipality’s preferred Financial ERP to ensure payroll is updated accordingly.

The sub-module therefore bolsters good governance, efficiency and transparency, while preventing unnecessary expenditure.

The screenshot displays the 'TIME AND COST' sub-module interface. At the top, there are navigation tabs for 'HOME', 'MAINTENANCE MANAGEMENT', and 'TIME AND COST'. The user is logged in as 'v8-admin@imqs.co.za'. The main section is titled 'TIMESHEET' and contains a table of timesheets and a 'General' information panel.

Reference Number	First Name(s)	Surname	Employee No.
T1705260022	Tshepo Israel	NYEMBE	10015654
T1705265064	WINNIE	HLUNWANI	10026329
T1710167915	LUCIA	WORST	600258
T1710256065	LUCIA	WORST	600258
T1710122372	LUCIA	WORST	600258
T1705264508	JOHN	MHLANGA	10011456
T1710306580	NDALA COLLEN	MASHEGO	10009935
T1710300507	NDALA COLLEN	MASHEGO	10009935
T1709119757	LUCAS	SEEMA	10008567
T1710246952	NDALA COLLEN	MASHEGO	10009935
T1711060524	Trevor	RUBBISH	1000000

General

Reference Number	T1705260022
Sheet Date	May 02, 2017
Employee No.	10015654
First Name(s)	Tshepo Israel
Surname	NYEMBE
Start Time	09:00
End Time	18:00
Timesheet Cost	230
Date Captured	-
Date Modified	-
Captured By	-

Figure 5: Time & Cost Sub-module

FUNCTIONALITIES.

1. PREVENTATIVE MAINTENANCE

The IMQS Maintenance Management Module supports Preventative Maintenance by enabling a user to:

- Query an asset, or asset-component's status
- Identify and maintain critical functions before asset failure
- Identify asset faults that could lead to the loss of critical functions
- Sweat test prevention

Municipal engineers are therefore able to proactively schedule and specify maintenance at repeat intervals, according to asset components, and in relation to procedures and tasks that need to be performed.

In the case of water demand management, for example, Maintenance Management and the IMQS Water Module integrate in order for the municipality to extract comprehensive and complex reports that will inform managers about problem areas, and thus further feed the preventative maintenance system.

2. METER MAINTENANCE

The Maintenance Management Module provides managers with an up-to-date, spatial view of all water-connection and meter-maintenance-activity history in the municipality's boundaries. By querying meter-related information, leveraged from the IMQS Water Demand Management Module, engineers can schedule maintenance according to accurate information. The module, moreover, enables a municipal manager to generate detailed reports that offer insight into completed or on-going work.

3. REPORTING

Reporting is integrated directly into the Maintenance Management system. Users can generate a wide range of reports – e.g. Trend Analysis, Full Detail, Performance and Executive Summary reports - relating to all maintenance activities and costs. Payment Certificates for all contract work undertaken can effortlessly be generated and printed on demand.

As an integrated and spatially enabled solution for Incident Reporting, the IMQS Maintenance Management Module helps municipalities overcome challenges and extract the most value they can from each asset they maintain.

ESTABLISHING LESEDI'S MAINTENANCE MANAGEMENT SOLUTION

The similar challenges faced by local authorities with regards to maintenance management leave them vulnerable to similar risks. Lesedi Local Municipality (LLM), together with IMQS, has taken an inclusive and pragmatic approach to reducing the potential risks of maintenance management challenges through harnessing the power of software.

MAINTENANCE MANAGEMENT CHALLENGES AND RISKS.

Many local authorities share similar challenges within their operations and maintenance (O&M) departments with regards to maintenance management, especially preventative maintenance.

CHALLENGES:

- Limited available budgets
- Inappropriate skill levels
- Under-capacitated staff
- Little or no information on the current location, state and cost of existing assets



THE LESEDI SOLUTION.

LLM and IMQS committed to an inclusive and pragmatic approach to reducing the potential risks of maintenance management challenges:

- **Inclusive** - following a process whereby the relevant stakeholders and their particular interests are considered in the design of the solution
- **Pragmatic** - the system-solution considers and emphasises existing processes that work effectively support the O&M team's process in a lean, efficient and non-intrusive manner

By conducting process workshops with LLM's key stakeholders, IMQS gained a proper understanding of the most important challenges in the Lesedi context and identified the required processes to address them. A preventative maintenance workflow process was developed for LLM on the IMQS platform. The solution takes the form of a browser-based application that allows users to:

- View relevant attributes of their asset data
- Import the appropriate scheduled tasks by asset type
- Receive scheduled task notifications
- Easily use feedback mechanisms to update the system of completed tasks

A boon to the operation was that LLM's Asset Register data already resided on the IMQS platform. The advantage of only having to rely on one platform architecture allowed the project team to create the preventative maintenance process on top of the already existing IMQS Asset Register module. Deployment, configuration and maintenance of the system were therefore quick and simple.

WHAT FUNCTIONALITY HAS BEEN MADE AVAILABLE?

The platform-independent application runs on any device that has internet connectivity, integrates with asset register data and is easily configurable:

Workflow setup & execution	Data	Map View	Grid View
Policy sheet import	Capturing and input	Asset Layout	Sort & filter tasks
Work team allocation	User Interface validation	Layer-themed maps	
Job card issuing & printing	Document linking	Standard GIS operations	

A UNIFIED VIEW

With a simple deployment, configuration and maintenance, LLM has been offered one unified view on all its asset information. This reduces the risk of making decisions based on dissimilar data sets. All matters related to preventative maintenance tasks and asset-location have become visible. Asset information is readily available to assist with decision-making and enable coordinated workforce execution, which saves operations costs in the long run.

IMQS is committed to helping municipalities achieve their business objectives through integrated, spatially enabled, Infrastructure Asset Management software solutions.

OPTIMISED O&M TO CURB WATER- INSECURITY AT RUSTENBURG

On 30 January 2017, Rustenburg Local Municipality officially launched IMQS's Maintenance Management system as part of a broader drive to manage its water-insecurity. This chapter briefly illustrates how IMQS has helped to optimise Rustenburg's operations and maintenance in a specific area: water.

WATER-INSECURITY AT RUSTENBURG.

Effective operations and maintenance (O&M) supports the provision of services and bolsters sustainable economic development. In order for this to take place, authorities need to make the most of their existing asset base to increase asset productivity and longevity.

In South Africa, the management of water resources and infrastructure accentuates the need for South African municipalities hard-hit by drought to change-step in their infrastructure asset management approach. Rustenburg has been no exception. Variable rainfall, intersected by exponential population growth and huge mining operations, makes the North West Province highly water-insecure.

In light of its hydro-vulnerability, Rustenburg identified the need for the improved management of its water and sewer infrastructure and related processes with a focus on improving operations and maintenance. Rustenburg appointed GLS and IMQS, both from the EOH Smart Government division, to establish a smart-water solution that could provide:

- Easy access to infrastructure information
- System performance results
- A plan to accommodate anticipated future growth within the municipal boundaries



DIGITALISING RUSTENBURG'S WATER NETWORK.

A first step towards smart-water management is to establish electronic water and sewer hydraulic models from numerous sources. Models provide a sense of the reliability of the information and help indicate what improvements could be made. GLS was put to the task of digitalising Rustenburg's water-network and developing a water master plan for the municipality.

To load the hydraulic models with real world demands, municipal water billing information was analysed, converted to water consumption, and spatially distributed within the models using GLS' Swift software. A number of projects identified as a result of the analysis are already being implemented, including a major rezoning project, as well as an upgrade to and optimised distribution of the Bospoort WTP. Mid- and long-term projects form the master plan to accommodate a potential doubling of the present water demand over the next 45 years.

VISUAL ASSET INFORMATION MANAGEMENT.

With Rustenburg's entire water system mapped, the IMQS Web platform has become the central node in managing Rustenburg's asset information geographically.

The IMQS Web platform allows for the latest network models and treasury data to be displayed on a number interactive map layers. A user-friendly environment facilitates rapid access to and interrogation of municipal infrastructure and treasury data at a pipe-by-pipe and stand-by-stand level of detail.

Up-to-date information, as well as the capacity for the platform to host real-time data from the field, allows Rustenburg municipal staff to easily monitor system performance and identify the need for timely interventions. The updated models and master plans are uploaded to IMQS regularly to ensure that current information is always accessible.

IMQS'S MAINTENANCE MANAGEMENT MODULE.

IMQS's Maintenance Management Module, launched on 30 January, was developed as part of a broader drive towards holistic infrastructure lifecycle asset management at Rustenburg. IMQS developed a GRAP 17 compliant Maintenance Management system for Rustenburg built on the back of a fully integrated living Financial Asset Register.

As an “engineering solution for engineers”, all engineering and financial asset information is consolidated on one GIS-centric web platform that assists managers to:

- Determine risk and performance profiles across different asset classes
- Make informed decisions
- Act decisively
- Communicate information across engineering and financial departments

In addition to increased accountability and improved decision-making, the new system has allowed for more effective resource utilisation, proactive maintenance, and enhanced resilience to crises. One of the project’s greatest achievements has been the continuous reduction of overtime from R1,5 million in 2015 to R328,000 in 2016. In terms of water, the IMQS Maintenance Management system has enabled Rustenburg to:

- Reduce water leaks
- Identify problem areas in space and time
- Resolve problems efficiently according to actionable information
- Reduce illegal connections
- Reduce the number of faulty meters

At Rustenburg, technology has become a driver of innovative change to overcome service delivery challenges whilst also satisfying infrastructure-related demand.

TURNING PERIL INTO PROMISE

The urban sociologist Robert Park¹² describes the city as “man’s most successful attempt to remake the world he lives in after his heart’s desire”. The evolution of the city has been intimately tied to technological revolutions that have:

- Helped humankind to become less reliant on animal power
- Enabled mass production
- Afforded digital capabilities and long-distance connectivity to billions of people

We are currently in the midst of a fourth revolution, where new technologies are “fusing the physical, digital and biological worlds”, resulting in what the Founder and Executive Chair of the World Economic Forum, Professor Klaus Schwab¹³ calls “a time of great promise and great peril”.

Technology is an enabler or catalyst of change, but not a solution in itself. IMQS is in the business of developing software to help organisations better manage all facets of city infrastructure (roads, water, electricity, etc.) - the business of turning peril into promise.

As a proudly South African company, we have spent over a decade focusing on enabling our clients through technology. Municipalities in South Africa work in an environment where innovation is stifled by challenges¹⁴ that include:

- Skills shortages
- Complex regulations that prioritise compliance
- Spending priorities torn between social and economic infrastructure

¹² Woetzel, J., Garemo, N., Mischke, J., Hjerpe, M., and Palter, R. 2016. Bridging Global Infrastructure Gaps. Report: McKinsey Global Institute. Online: <https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/bridging-global-infrastructure-gaps>.

¹³ United Nations. 2014. World Urbanization Prospects: Revision 2014. Online: <https://esa.un.org/unpd/wup/Publications/Files/WUP2014-Highlights.pdf>.

¹⁴ Harvey, D. n.d. “The Right to the City”. Online: <https://davidharvey.org/media/righttothecity.pdf>.



Within this challenging environment, IMQS's aim is to ensure that the engineers and accountants in charge of using taxes to plan, build, operate and assess city infrastructure have a complete view of their asset landscape. Our intuitive, GIS-based Web platform forms the base of a broader integrated software product suite that has been developed in accordance with international infrastructure asset management best practices.

We work closely with our clients so that our solutions reflect their business processes. In the case of Rustenburg Local Municipality, that has struggled to conserve water amid drought, population growth and budgetary constraints, the ability to record, structure and leverage asset data has helped save over R300 000 in areas of operations and maintenance in just one year. We are proud that our software promotes communication and transparency across all departments and stakeholder groups, and contributes to the fight against corruption that plagues public offices the world over.

With the right information at hand, and transparent systems in place, municipalities, utilities and city governments in South Africa, and beyond its borders, can make informed decisions, and be held accountable for their actions by the populations they serve. All this is done with one goal in view - to enable the development and management of smart, well-governed, honest, secure and inclusive cities that represent the sustainable human habitats of tomorrow!

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OUR SOLUTIONS.

The consequences of not managing infrastructure assets proactively can lead to unnecessary costs, infrastructure failure as well as health and safety issues.



To address the various problems that Infrastructure Asset Management presents, IMQS offers a modular set of solution operating independently or in an integrated manner.

A summary of the various modules, categorised by infrastructure type, are as follows:

INFRASTRUCTURE TYPE

KEY CAPABILITIES & FEATURES



ENERGY

- Plan more effectively and proactively for existing and future energy demands
- Report on results produced during a master planning process
- Interfaces with treasury or other meter reading databases
- View / present utilisation, revenue, electricity demand / loss data on an area-by area basis



ROADS

- Web-based, spatially-enabled Pavement Management System
- Monitor road networks
- Communicate information and maintenance needs
- Identify, quantify and prioritise maintenance and rehabilitation needs
- Analyse and model the condition of road segments



WATER

- Transition from a purely supply-based focus to a proactive demand management focus
- Improve the ability to reduce expenditure on new infrastructure because demand management initiatives can be effectively implemented
- Develop plans to progressively ensure efficient, affordable, economical, and sustainable provision of water and sanitation services

INFRASTRUCTURE TYPE



SOLID WASTE

- Web-based, spatially-enabled Solid Waste Management Service Infrastructure application
- Capture base data related to Solid Waste Management site infrastructure
- View fixed assets contained within the Solid Waste Management sites
- Document linking, searching and retrieval



PROPERTY & BUILDINGS

- GIS based viewer and reporting tool
- Technical site assessment
- Financial modules



SEWER PLANNING & ADMINISTRATION

- Development of Water and Sewer Master Plans
- Population of water and sewer models' databases
- Sewer tariffs can also be billed according to water consumption
- Calculate the income and tariffs for sewage discharge



STORM WATER

- Web-based, spatially-enabled Storm Water Management System
- Provides data necessary for improving safety and reducing damage
- Optimise funding towards storm water management
- Prioritise problem areas, risks management and projects

FUNCTION



ASSET MANAGEMENT

KEY CAPABILITIES & FEATURES

- Provides a structured approach for the development, coordination and control of activities relating to infrastructure assets by an organization over the lifecycle of its assets
 - Access and integrate asset management data seamlessly
 - Supports the identification and management of risks throughout the lifecycle of infrastructure assets
-



PROJECT CONTROL SYSTEM

- Allows infrastructure projects to be planned and managed with excellence
 - Provides the following minimum functions:
 - Project Creation
 - Project Planning
 - Program Management
 - Spatial Representation
 - Budget Management
 - Project Reporting
 - Provide complete control over costs and effective monitoring
 - Increase real-time visibility into key performance indicators
 - Ensure compliance with corporate governance, laws and regulations
 - Provide best of breed 'construction project' functionality
-

IMQS IN NUMBERS



100% GRAP Compliant



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