

DWA: WATER SERVICES ASSET MANAGEMENT STRATEGY: INTRODUCTION AND GUIDELINE ON DEVELOPING AN ASSET MANAGEMENT PLAN

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ABSTRACT

Managing Infrastructure assets to meet people needs has existed since humans first began building infrastructures to meet the need intended by those particular infrastructures.

Water services infrastructure cannot be allowed to deteriorate to crisis levels, impacting and affecting national government's growth and poverty reduction targets.

The work by the Department of Water Affairs (DWA) and others in assessing and documenting the state of water services infrastructure, served to underline the need for a Water Services Infrastructure Asset Management (IAM) Strategy, and the importance of it being programmed, budgeted for, and implemented without delay.

The development of this Strategy is a key milestone signalling determination on the part of DWA as sector leader, and its partners, that increasing attention be paid to water services IAM. It is part of a broad set of initiatives to improve IAM at all levels of government.

It is written as a road map of commitment and intention for DWA and its partners at national level; a statement of the rationale for and a specification of the high-level actions required to empower and guide Water Services Institutions (WSIs) in practicing sound IAM practices. It is also written to inform WSIs on the support they can expect, and will also be useful in holding national government and its partners to account, and to contribute to a shared vision of appropriate support.

To compliment the Strategy, the Department has also written a Guideline document to assist Municipalities in developing an Asset Management Plan. This Guideline will be presented with copies being distributed at the conference together with the Strategy.

1. DEFINITION OF INFRASTRUCTURE ASSET MANAGEMENT

Infrastructure Asset Management (IAM) is an integrated process of decision-making, planning and control over the acquisition, use, safeguarding and disposal of assets to maximise their service delivery potential and benefits, and to minimise their related risks and costs over their entire life.

Thus IAM includes operation of infrastructure assets, and also planned maintenance and repair, refurbishment and renewal, and provision for replacement of the infrastructure.

This definition indicates that IAM:

- Takes an organisation-wide perspective and draws upon applicable principles and techniques in the management, engineering, accounting and social sciences (including human resources).
- Has an outcomes focus (i.e. a focus on outcomes such as maximisation of service delivery potential, protection of the ability of the infrastructure network(s) to deliver services, cost effectiveness and efficiency).
- Confers a custodianship role on the managers of infrastructure and their political leaders – i.e. that they are the “custodians”, responsible for the lifelong sustainable operation of the infrastructure, and for service delivery not only to the current users of the infrastructure, but to future users as well.
- Must take into account both consumer expectations (including levels of service, and cost of the service) and the legislative environment

(e.g. financial and environmental legislation, including any regulatory regime (e.g. regulation of drinking water quality).

2. PROBLEM STATEMENT

South Africa has progressed well with legislating for IAM in the water services sector, and many WSIs deliver infrastructure services reliably, without unscheduled interruption, and according to specification. These WSIs have skilled staff, and the management of infrastructure assets and services is sufficiently budgeted for.

However, where WSIs are not prioritising IAM, where there may be insufficient political will, and where skilled staff and budgets are not available, there has been failure of service provisioning which, in the worst cases, has resulted in total collapse of service provisioning.

A key requirement of water services legislation is for WSIs to develop and apply IAM through their Water Services Development Plans (WS-DPs) and water board business plans. To date these plans have focused more on the development of new infrastructure to address the basic services backlog, and less on the IAM requirements over the life of existing and new infrastructure.

3. VISION, AIM, OBJECTIVES AND PRINCIPLES

3.1 Vision

The vision, the Strategy has for the sector is that proper life cycle management of water services assets are fully integrated into the water services business of all WSIs in South Africa.

3.2 Aim

The aim of this Strategy is that DWA and its partners will empower and guide WSIs to practice sound IAM, aimed at ensuring optimal utility from public investments in water services infrastructure, and the reliable and sustainable meeting of service delivery obligations.

3.3 Objectives

The objectives of this Strategy are to:

- Create a platform for coordination of principal role players to support WSI IAM as a matter of national priority.
- Address water services infrastructure failures in targeted WSIs in the short term, and effect improvements that can be publicised in order to demonstrate the benefits of IAM.
- Develop in the water services sector in the longer term a culture of sustained improvement in the management of infrastructure.

3.4 Principles

The following principles underpin this Strategy:

- **Systems approach.** IAM planning must look at the entire delivery chain (i.e. delivery of water services), identify the constraints within the system as a whole, and then methodically address these, prioritising the most serious constraints.
- **IAM is an integral part of ongoing service delivery.** As an integral part, IAM is a continuous process, not a once-off project or an event. It is a process firstly in the sense that improvement must be planned, and improvement must be progressive. It is a process secondly in the sense that improvement is not static – demands, performance objectives, technologies all change with time, and infrastructure is subject to wear and tear and to obsolescence. And it is a process thirdly in the sense that infrastructure management and improvement in infrastructure management is, or should be, a day in and day out duty of the owners of that infrastructure.
- **Water services focus.** This Strategy addresses improvements in the practice of water services IAM, as opposed to the management of water resource infrastructure or other municipal infrastructure such as roads and stormwater, electricity, solid waste facilities or public amenities.

- **IAM focus.** Numerous challenges are encountered in IAM, such as the lack of technical expertise. This Strategy recognises the broad array of challenges with which infrastructure managers are presented, but concerns itself with the formulation of priority actions to address IAM-specific issues.
- **Recognition that water services delivery is both a human right and commodity-based.** Water services infrastructure is utilised to treat, transport or store a commodity – i.e. water. The quality of water services is directly linked to the protection of water as a scarce resource, the quality of potable water and its impact on health and safety, and the quality of discharge into river systems.
- **Outcomes-based.** Each priority must be outcomes-based and measurable.
- **An appropriate mix of short term successes and long term sustainability.** Properly managed infrastructure assets have life spans that can be measured in decades, and thus the full benefits of IAM are felt over successive generations. Whereas this Strategy recognises that the full establishment of IAM practices has a medium to long-term horizon, it also recognises that short-term successes are not only possible but are required to establish credibility, harness support and to improve failing service standards.
- **Promotion of an integrated, inter-disciplinary and inter-sectoral approach.** IAM operates at the interface of several functional disciplines, some of which include accounting and finance, town and regional planning, and engineering. The role of communities and of political leadership is also important – the latter sometimes of overriding importance. This Strategy promotes appropriate inter-disciplinary and inter-sectoral alignment, and thus an integrated approach to IAM.
- **Focus on the key challenges, and prioritise.** Numerous challenges present themselves in the management of water services infrastructure. The Strategy recognises that only a select group of challenges can be addressed at any one time, and that the key challenges that impede the adoption and practice of sound IAM must receive priority attention.
- **Adoption of the Pareto (80/20) Principle.** This Principle states that a small proportion of the full effort required to achieve a particular result generally achieves close to the desired result. And that further efforts are often subject to diminishing returns. This is sometimes stated as “80% of the full result from 20% of the full effort”, or the 80/20 Principle (or rule). It is usually valid for IAM. (Extending this thinking, a “scan” effort, to determine as quickly as possible where the most critical problems lie, followed by the first steps of what would be a longer improvement process, would often be worthwhile. This effort can, quickly and cheaply relative to a more thorough effort, both bring about some rapid incremental improvement and also ascertain the extent of a problem and how much further effort would be required.)
- **No one size solution fits all.** While the general principles of IAM remain valid for all institutions, the priorities differ from institution to institution, and also change with time – as do the techniques, the technological and non-infrastructure options and other factors.
- **Start with the basics, and get them right.** The approach must be incremental. Do not attempt to progress further until the basics are right. Address the weakest links in turn – and as each is improved and is no longer the weakest link, attend to the new weakest link. Where there is strength, support it, and build on it.
- **Political, management and operational focus.** All levels must commit to IAM in order for it to be successful – from politicians who ensure political will, legislative compliance and community requirements, to planning by management, to implementation at the operations level.

4. BENEFITS, SCOPE AND PROCESS OF IAM

4.1 Benefits of IAM

It is internationally recognised that the application of IAM practices has numerous benefits for asset owners, the beneficiaries of infrastructure services and other stakeholders

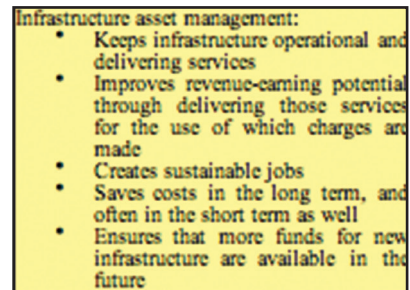


Figure 1 – Benefits Summary

Effective management of infrastructure is central to public sector institutions that seek to provide an acceptable standard of services to the community. Infrastructure impacts on the quality of living environment and economic health.

Not only is there a requirement to be effective, but the manner in which the institutions discharge their responsibilities as public entities are also important. They must demonstrate good governance and consumer care, and the processes adopted must be efficient and sustainable. Councillors and officials are custodians on behalf of the public of infrastructure assets, the replacement value of which, even in a small municipality, can amount to several hundred million Rand, and in larger ones, to several billion Rand.

An integrated IAM process and programme will have a very significant positive impact. It will:

- Assist public sector infrastructure owners to improve decision making about their capital plan requirements.
- Change cultures, with the aim of instilling an integration of information and decision making across all owners of public sector infrastructure (including through different spheres of government).
- Provide an environment for more productive relationship with government stakeholders and consumers.
- Provide a cradle-to-grave picture of their IAM that will guide owners in their planning and sustainable implementation of IAM.
- Focus institutions on providing services that will improve in quality over the short, medium and long term.
- Enable institutions to identify and maintain key assets, which will lead, among other things, to fewer instances of non-compliance with national standards (e.g. drinking water quality regulations).

The business model for IAM must focus on minimising the lifetime total costs of infrastructure assets, while still achieving service goals with respect to:

- Delivering those services, and meeting goals with respect to reliability.
- Complying with statutory requirements with respect to, for example, quality and resource usage.
- Buying new capital assets.
- Operating current assets.
- Maintaining current assets.
- Refurbishing and renewing assets.
- Replacing aged assets.
- Disposing of non-functional assets.

5. SCOPE AND PROCESS OF IAM

IAM is not a once-off or external intervention. It must become integrated into the operations of the institution owing or managing the infrastructure.

Furthermore, it must be a process that involves continuous improvement. However good or bad the IAM of an institution currently is, the performance cycle must be upwards. For example, knowledge of assets might be minimal to start with, but improved asset O&M will lead to improved performance and more effective service delivery, and all the time knowledge of assets will be improving. If knowledge of assets is good to start with, then attention might focus on improving demand prediction, risk analysis, and identifying optimum technological solutions.

In brief, the scope and process of IAM constitutes:

- Assets can only be managed if they are known about. Thus, at minimum, there must be knowledge of at least those assets most critical to service delivery – what they are, where they are, to what extent they are still working, and their capacity.
- The level of service of each infrastructure facility or component must be known, including its capacity, and relationship to demand – how much spare capacity is there?
- There must be knowledge of current demand and prediction of demand; and whether an asset is still required, whether an asset needs its capacity supplemented, etc.
- Finance is of fundamental importance. Can the infrastructure owner afford to manage the assets, given the costs of operation and of maintenance, and of renewal and recapitalisation? If the costs cannot be afforded, what are the consequences? To what extent is finance dependent on revenue derived both directly and indirectly from provision of the service? And to what extent is the overall viability of the owning institution dependent on that revenue? Then – can the owner afford not to manage the assets, given the loss of revenue, loss of amenity, and other losses were the infrastructure to deteriorate and the service delivery to be hampered?
- Planning is also of fundamental importance. How will the infrastructure be managed, and the service provided – bearing in mind that IAM involves people, processes, systems and finance? This needs to be set out in an IAM plan (which can be very simple to start with).

Improved service delivery leads to improved finances, then to better IAM planning (which is the current focus of implementation of the strategy), better knowledge of the assets, and so on, leading to improved service delivery – and the cycle of improvement continues.

6. GUIDE TO IMPLEMENTATION OF WATER SERVICES ASSET MANAGEMENT STRATEGY.

6.1. The Asset Management Plan

'Getting Started' Guideline Document has been written to support the Asset Management Strategy produced by the Department of Water Affairs in 2012. It has been written to provide a starting point for those Water Service Authorities that have little or nothing in place, so that they may 'get off the starting block' in terms of becoming compliant. The guideline acknowledges that there are many excellent documents already written which will go into far more detail as your organisation progresses in line with the strategy. This guideline has been written in an informal basis to drive home the basic requirements necessary, in particular the Asset Register, in order to get started and succeed in having a basic Asset Management Plan in place. The structure of your Asset Management Plan (AMP) will then be in place and the foundations will be set to take the process forward and to a level of detail that is necessary for your organisation.

An AMP is a critical management tool that introduces discipline and logical processes into the planning of an organisation's activities around the infrastructure that falls within their responsibility. And once again it is a legal requirement just like a driving licence!

The consequences of a good AMP are numerous and these will be highlighted in the "Getting Started" guideline document, however it will include sustainability of the infrastructure that you are responsible for, effective operation and maintenance of the equipment which will lead to a better quality of product (working towards or maintaining Blue and Green Drop status) with fewer breakdowns, continuity of service delivery as the needs of the consumers change over time, greater understanding of what is required to continue effective delivery, prioritising interventions, and across the board there will be massive cost saving because of efficiency, reduced leakage, productive staff, unnecessary replacement of equipment, good planning to ensure the most appropriate delivery of services, and so it goes on...

6.2. What Are The Key Ingredients?

There are five key ingredients identified below that are essential for developing an effective Asset Management Plan. These are as follows:

- The first ingredient is the **Scope** of what you are responsible for. In the case of a Municipality – what is your area of jurisdiction, how many people do you have, what level of services is existing and what is planned for in the future – if the Scope was a cake – it is the size of the cake, how many it will feed, now and tomorrow and whether it is basic sponge cake or a glitzy cheese cake. To use the cliché of "You can't manage what you don't know" may be a little tacky to apply, but at the same time, it is so true.
- The **most important ingredient** in your Asset Management Plan, around which everything else is subservient, is the **Asset Register** – it is the flour in the bread, the grape in the wine, it is the players in the soccer team. The Asset Register provides a logical approach to establishing the 'know' within the quote above – once you know what you have, then you can start applying management principles.
- The next ingredient is **Money** or finance!! What are the funding requirements to make this all happen, how much will it cost to maintain the infrastructure that is presently under your control, how much will it cost to expand infrastructure to new areas where consumers want a higher level of service? How much will it cost to replace existing infrastructure in the future and what plans are being made now to ensure that money is available at the time the replacement is needed and to ensure continuity of supply?
- Next is the methodology or Asset Management **Practices** – how do we bake this cake? This is the 'How' component rather than the 'What' – how do we **operate** the infrastructure we have? What structures do we need in place to ensure effective operation and **maintenance** continues in the future? What type of personnel do we need to employ to make this happen? Do we have the required moveable assets – the tools, the vehicles, the spare parts to make it happen?
- The fifth key ingredient, with equal importance to the Asset Register and without which nothing else will happen, is **People**. Each and every stage of the Asset Management Plan development is driven by people. Monitoring, reporting, reaction and accountability is all driven by people.

6.3. Steps to developing an Asset Management Plan

The guideline has identified Six steps which culminate the ingredients detailed above and these steps must be ascended to achieve the goal of having an AMP in place. The six steps incorporate the Technical Assessment, the Financial Assessment and the Asset.

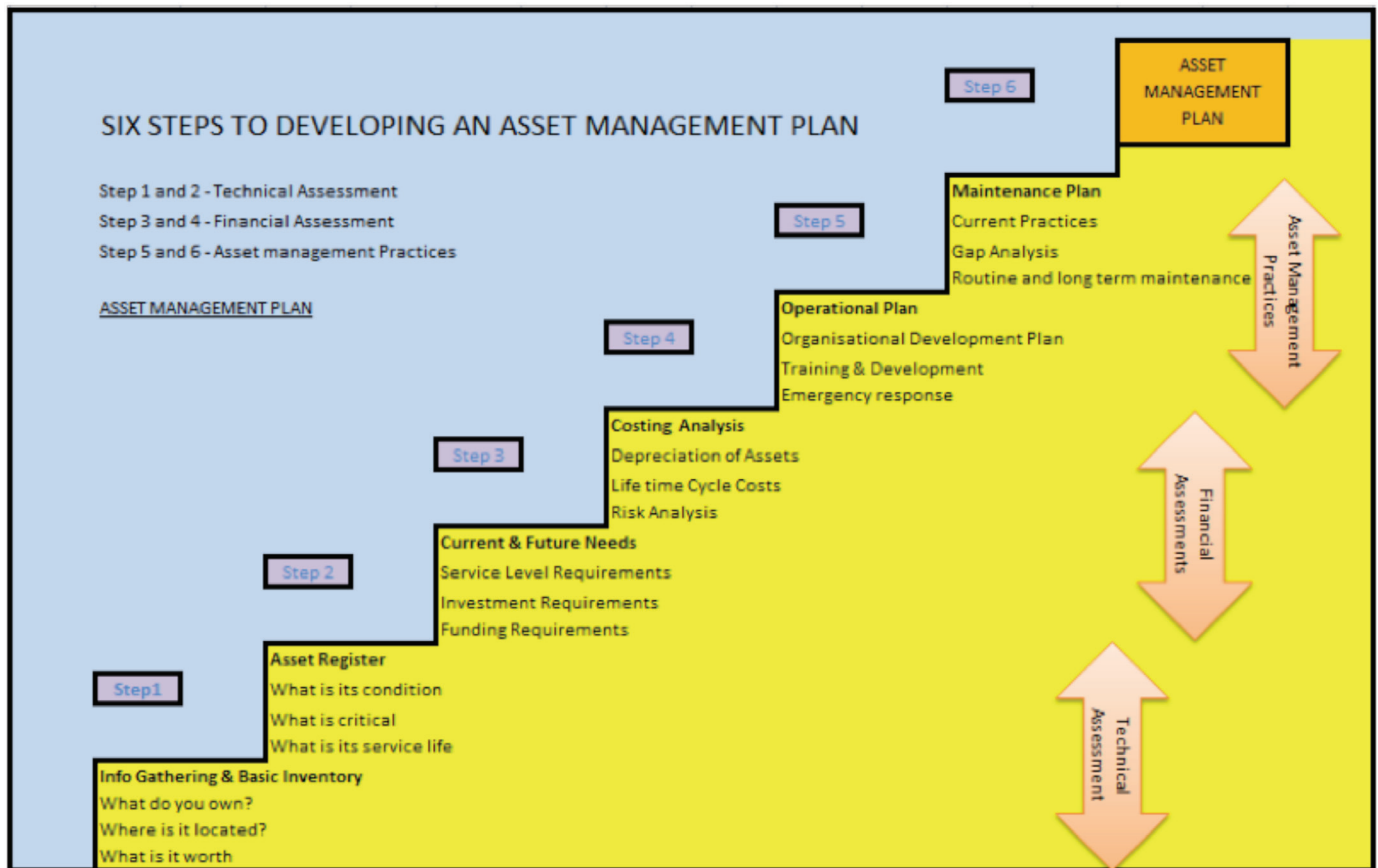


Figure 2 – Six Steps to an Asset Management Plan

7. CONCLUSION

- In terms of the Water Services Asset Management Strategy outputs, DWA will lead the actions within each output, taking responsibility for those within its power to do so, and working closely with other national government departments where responsibility for the envisaged action is statutorily with those departments. DWA will cooperate with all stakeholders, including national government departments, local government and other sector role players.
- Guideline – ‘Getting Started’ has been developed with the intention of complimenting the Water services Asset Management Strategy. The guideline document is to be used by WSAs and WSIs to support those that have nothing or very little in terms of an Asset Register or an Asset Management Plan, and to get them off the starting block in this regard. The guideline document has provided a step-by-step guide as to how Municipalities can actually make it happen. Even if Municipalities currently have nothing in place, if they follow the steps provided, it will give them the foundations on which to build upon. There has been a particular focus on the Asset Register since this is the most important component, without which an Asset Management Plan cannot be developed. As mentioned earlier, there are many excellent documents in the sector Management Practices.
- The provision of an AMP is a legal requirement for every Municipality in the country. Without an AMP owned by the Municipality, the law is not being adhered to. The DWA has identified DWA AM Champions in each Province of South Africa and trained all of these Champions to roll out the strategy and guideline document to the WSA’s in their area of responsibility. The training they provide will inform the WSA of the strategy, and present the guideline document so that they have the knowledge and tools to create, or develop further, their own AMP into a suitable product. However, the support that DWA provides, if indeed

required, does not remove the obligation of the WSA to develop it themselves. It is their responsibility to deliver and DWA will guide and support the process as necessary.

- These Water Services infrastructure assets represent a huge investment from the community, which has been built up over a long period of time. These are the reasons why management skills must be applied to ensure that those infrastructure networks are resilient and are provided in a sustainable way to meet people needs. DWA also entails looking forward to manage emerging issues, such as climate change and the need for accessibility and environmental sustainability, so that Water Services Infrastructure remains able to meet public needs through the 21st century and beyond.

8. REFERENCES:

SOUTH AFRICA. Department of Water Affairs. 2011. Water services infrastructure asset management strategy. Strategy.

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