



Municipal Asset Management Toolkit

A GUIDELINE FOR LOCAL DECISION MAKERS



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DEUTSCHE ZUSAMMENARBEIT

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Schweizerische Eidgenossenschaft
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Network of Associations
of Local Authorities
of South East Europe







WHAT IS ASSET MANAGEMENT? An integrated approach to monitoring, operating, maintaining, upgrading, and disposing of assets cost-effectively, while maintaining a desired level of service and is intended for improving the overall business performance.




THE PRIMARY OBJECTIVE: to assist organizations in meeting a required level of service in the most cost-effective way.




THE MAIN GOAL: to extend the expected asset's service life, and thereby maintain its performance.




WHY USE ASSET MANAGEMENT? After a number of years with relatively stable period, degradation of asset's condition and performance starts increasing the operating costs significantly. To avoid it, multiple intervention points including a combination of repair, preventive and/or predictive maintenance activities, and even overall rehabilitation are required. With strategically timed investment the overall asset life cycle can be extended. The key is to **intervene before degradation** has reached a point that it is more economical to replace than to rehabilitate.




THIS TOOLKIT IS INTENDED FOR local decision-makers, both in Municipalities and Public Utilities (PU), who should act and focus on what is **best for the community** in providing PU services.








HOW TO USE IT? As a step-by-step following a top-down approach, with starting point a **clear assignment of roles and responsibilities** between local governments (Municipalities) and PU companies, as well as assignment of tasks within staff of both local actors.



WHY WE NEED ASSET MANAGEMENT? The current practice in managing PU infrastructure has not been satisfying. Local decision-makers should care about **managing PU assets in a cost effective manner**, while PU companies are obliged to above all, provide **continuous and undisturbed utility services to all customers**. However the **methodology or a system** for achieving aforementioned requirements is not clearly set.



The most important trigger for the implementation of asset management practices in public utility is the **concern about aging physical assets**. Without required annual maintenance and no strategic and periodic upgrade, the assets will deteriorate significantly. PUs are facing not only **lack financial resources** even for regular maintenance (not to mention bigger investments) but also **lack of basic data** on characteristics and location of assets. Finally, there is usually **no long term planning of capital investments** based on balancing risks and consequences of asset failure with costs of investments.





THE STRUCTURE OF AN ASSET MANAGEMENT (AM) SYSTEM

recommended by this toolkit should consist of the following elements:

Asset management policy

Key purpose: **Establish a clear direction** in which decision-makers want to go in planning future activities regarding provision of utility services.

Asset management strategy and objectives

AM strategy is a high level document **developed jointly** by municipality and PU. It guides the overall AM activities, **explores long term** (at least 20 years) **strategic issues** and should be aligned with the municipal strategic development goals and **cover macro activities**.

AM objectives need to **demonstrate commitment** of decision-makers to **continuous improvement** in **provision of utility services**.

Asset management plan

AM plan is a strategic document that states how a group of assets are to be managed over a period of time. It describes the **outcomes** (and timing) that result in meeting key strategic objectives and presents a **summary of all findings** during the previous phases of asset management system.


AM Plan should provide the **level of service in more detail**, indicating how the system should behave, as well as what activities should the utility provide, in order to meet the regulatory and customers' requirements.

A detailed asset management plan has the following sections:

- executive summary (overview of the plan)
- introduction (infrastructure assets and how they support economic activity and improve quality of life)
- state of the assets (asset types, size and quantity; financial accounting; asset age distribution; asset condition, performance and risk profile)
- expected levels of service (levels of service through performance measures, external trends or issues, current performance relative to the set targets)
- program of measures (planned maintenance, replacement and expansion activities)
- financing strategy (yearly expenditure, provide actual expenditure, funding shortfalls...).

Asset management human factors

The key is to have **clear understanding of the responsibilities** for those implementing AM (the role of municipality: developing AM Policy and AM Strategy; the role of PU company: asset management techniques and development of AM plan). Crucial element is to **establish a clear accountability** for asset management at top level.



Asset management techniques

It is critical that decision-makers have a **clear knowledge of the condition** of their assets and how they are performing (e.g. age or ability to provide the required level of service).

Many municipalities and PU companies usually lack information about owned assets and their location. Such **lack of detailed data inventory is not a barrier** to develop an initial asset management system.

The next step is to **identify the risk of asset failure** (to help prioritize the most critical assets and make more informed decisions on the use of the budget). Always take into consideration the likelihood that a given asset is going to fail, this should include: asset age; asset condition (failure type and cause, mode and behavior); general experience with the asset.

When **determining the consequence of asset failure** take into consideration: cost of repair; social costs related to the loss of the asset; repair/replacement costs related to collateral damage caused by the failure; environmental costs related to the failure; reduction in level of service. **Always** apply a **simple scoring system** (e.g. grades from 1-5).

Asset valuation is crucial for the real/remaining value of the assets and could be defined as the value of the remaining useful life of assets and requires a **periodic revaluation**.


The infrastructure **life-cycle AM** approach comprises on the following phases: planning of the full asset life cycle; establishment/creation of the infrastructure asset (design, procure and construct); operation and maintenance of the infrastructure asset; rehabilitation/renewal of the infrastructure asset. Always **include all phases in planning process** however keep the budget constraints in mind.

All previously undertaken AM techniques should indicate options for interventions:

- which asset need normal/regular maintenance and those that require certain capital investments;
- the priority of undertaking specific measures.

Properly operating and maintaining assets is critical to the effectiveness of the whole company. The primary goal of maintenance is to avoid or mitigate the consequences of failure of assets, which can be costly. Both operational (standard, alternate and emergency) and maintenance (preventive and reactive) **procedures should be standardized**. It is important to have a work order for every maintenance activity as such data can be very helpful for further analysis.

Still, when a failure occurs, the asset can be repaired (restoration beyond normal periodic maintenance), rehabilitated (replacement of a component to return the asset to the level of performance above the minimum acceptable level), or replaced (substitution of an entire asset with a new asset). Interventions can be: routine repair and replacement (in periodic intervals) and major rehabilitation and replacement (minimum of 5 years planning period).



Asset management monitoring and improvement

In order to determine whether the AM system has been implemented and maintained, asset managers should periodically monitor performance of the AM practices in **meeting strategic goals and objectives**. Gender issue in the framework of the AM should also be taken into consideration.

Asset information management

Without good information it is impossible to make good decisions concerning the AM. Asset information is a combination of data on physical assets used to inform decision-makers about how the assets were managed and also has a **very valuable and very important role** in the efficiency and performance of organizations.

The infrastructure asset management (the ISO 55000 series) is based on: owning the data, information and knowledge concerning the property.

Asset information management strategy **includes systematic approach** to managing asset information and needs to define how an organization intends to assure collection, organization, maintenance, use and analysis of asset information in order to effectively support processes of both strategic and operational execution. Information management strategy includes objectives that need to be specific, measurable, achievable, realistic and timed.


Information required for the effective AM can be grouped as: strategic, tactical and operational. Always keep in mind that user groups require information that is different in their purpose and level of detail; nevertheless **consistency** of information must be preserved both within and outside of the organization.

It is essential to provide **information about the condition and performance of assets** (assets age; current condition; actual assets value; assets location; maintenance, repairs, and replacement records for assets...).

Classification of information is usually hierarchical and can be based on assets' function or type and directly shapes decision-making in asset management processes. Assessment information cannot be reduced only to "yes" or "no" answers.

It is necessary to **continue with the assessment of data quality** as this is a key element of effective AM. Without confidence in the accuracy of information, there is no effective AM system. Even in circumstances when an organization does not have sophisticated information systems, it is possible that adequate asset information exists within the organization. Assessment should be carried out before deciding on AM information system in order to deduce which systems are appropriate for the organization.

Conventional AM information system comprises of two principal components: relational database with asset data, and software tools for analysis and decision support. In terms of the coverage of AM scope, software can be categorized as general purpose and asset specific purpose.





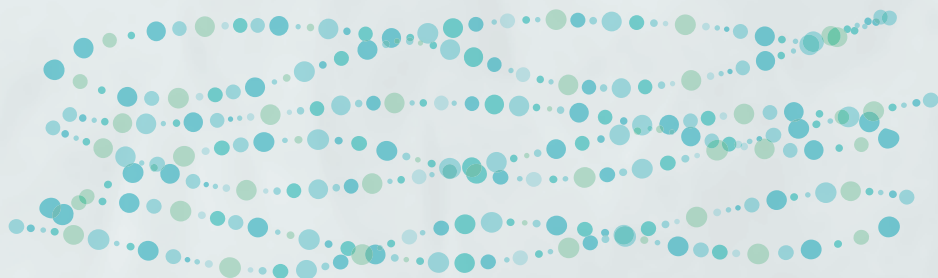
The most important information systems used for asset management are:

- ▶ **Enterprise Resource Planning System (ERP)** – used for maintaining and analysis of general accounting ledger, tracking accounts payable/receivable, budgeting and fixed assets depreciation.
- ▶ **Customer Information System (CIS)** – used for gathering, management and analysis of services rendered to consumers and relevant consumed quantities (e.g. water consumption).
- ▶ **Computerized Maintenance Management System (CMMS)** – designed to handle planning, logging and monitoring of preventive and corrective maintenance of organization's assets.
- ▶ **Geospatial Information System (GIS)** used for visual presentation and analysis of assets on geo-referenced maps.

Asset-specific software manages sub-sets of assets they are designed to support. They include:

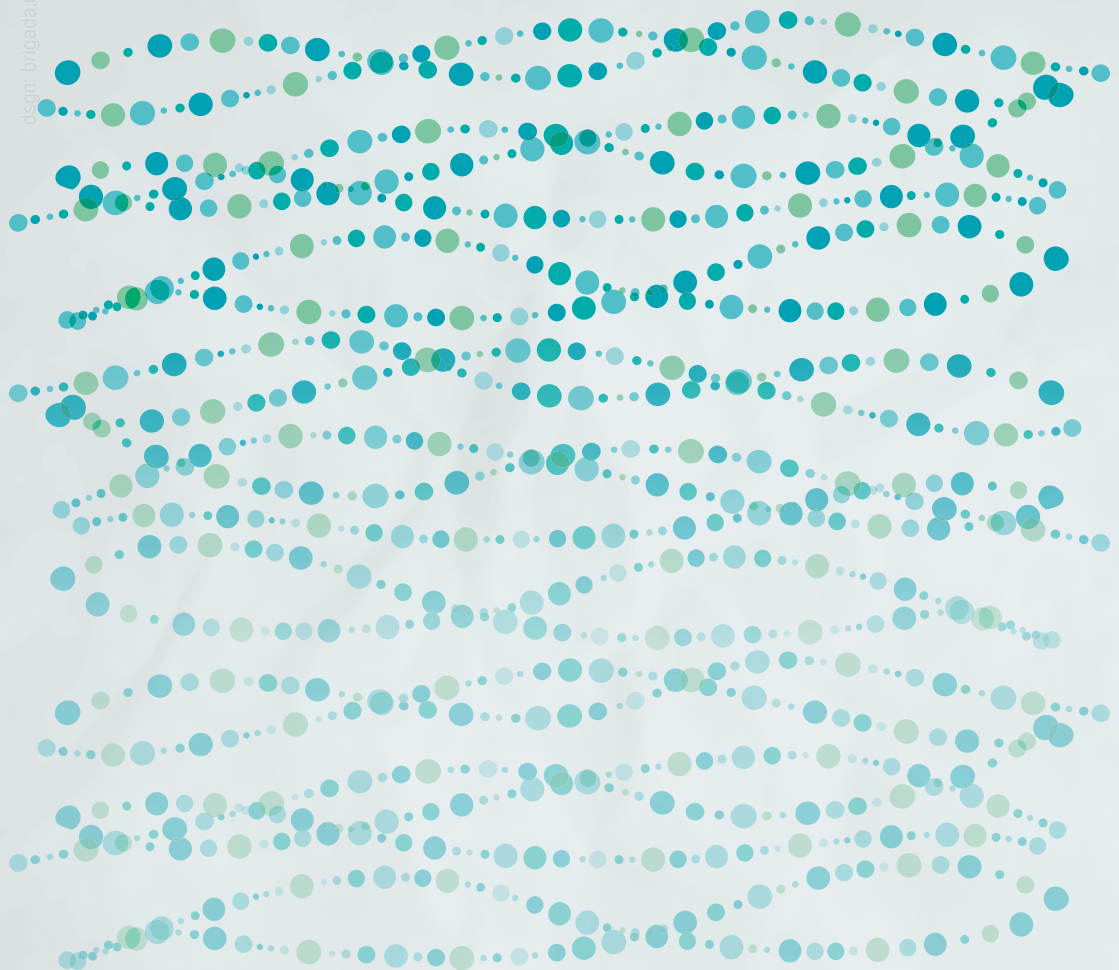
- ▶ **Supervisory Control and Data Acquisition System (SCADA)** – Systems aimed at automatization and remote surveillance and control in real time
- ▶ **Capital Program Management Software (CPMS)** – Systems intended for planning, monitoring and control of capital projects related asset management
- ▶ **Engineered Management Systems (EMS)** – Information systems for evaluation of asset conditions in terms of performance levels and tool for assessment of requirements for maintenance

Such systems and their information can contribute to improving capabilities for improve efficiency of systems through system modeling process and assessing effectiveness of investment and maintenance policies.



The Municipal Asset Management Toolkit was developed within the project “Asset management for water and sanitation sector in South-East Europe” during the period June – November 2014. The project is funded by the German Ministry of Economic Development and Cooperation (BMZ) and the Government of Switzerland, is implemented by GIZ (ORF MMS) and the Network of Associations of Local Authorities of South-East Europe (NALAS). The main role in the implementation of the project activities is designated to the Local Government Associations from Western Balkans countries, coordinated by the Standing Conference of Towns and Municipalities from Serbia.





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