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NAME OF ASSET				
General information				
Description		Manufacturer		**Asset picture or AutoCAD drawings**
Brand name		Model		
Location		Category		
Department		Warranty type		
Warranty Expire		Asset number		
Section		Condition		
Status		Assigned to		
Current value		Replacement cost		
Serial number		Quantity		
Insured by		Policy		
Size		Shape		
Number made		Year made		
Made of		Colour		
Group		Taxable/Insured		
Code		Lease Description		
Lease begin		Lease end		
User		User currency field		
User date				

Sample picture

Basic Asset Documentation Guidelines (Draft Version)

Hanoi, April 2007

Ministry of Construction – Hanoi

in cooperation with

Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH

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Glossary

AD	Asset Documentation
AM	Asset Management
BMZ	German Federal Ministry for Economic Co-operation and Development
CDP	Cooperation Development Plan
CV	Curriculum Vitae
DARD	Provincial Department of Agriculture and Rural Development
DBMS	Database Management System
DOC	Provincial Department of Construction
DOF	Provincial Department of Finances
DONRE	Provincial Department of Natural Resources and Environment
FA	Financial Assistance
GIS	Geographic Information System
GFA	German Consulting Group and Technical Assistance for WWM
GTZ	German Agency for Technical Cooperation
KFW	German Development Bank
MIS	Management Information System
MOF	Ministry of Finances
MOC	Ministry of Construction
MS	Microsoft
OLE	Object Linking and Embedding
O&M	Operation and Maintenance
PC	People's Committee
SOP(s)	Standard-Operation-Procedures
TA	Technical Assistance
TOR	Term of Reference
URENCO	Urban Environment Company
UWC	Urban Work Company
WS	Water Supply
WW&D	Wastewater and Drainage
WWM	Wastewater Management in Provincial Urban Centers

1. PROLOGUE

1.1 Background

The Technical Assistance (TA) project "Wastewater Management in Provincial Urban Centers in Vietnam" (WWM) is jointly implemented by the Vietnamese Ministry of Construction (MoC) and the German consulting firm GFA Management on behalf of the GTZ. The project provides technical support to six WW&D companies in provincial urban centers in Vietnam, including Bac Ninh, Can Tho, Hai Duong, Soc Trang, Tra Vinh, and Vinh (Nghe An). All six urban centers are at the same time supported through Financial Assistance (FA) programs, jointly financed by a loan of the German Kreditanstalt für Wiederaufbau (KfW) – (70% of investment cost) and the Vietnamese Government – (30% of the investment cost), comprising the construction of wastewater sewers, storm water drainage, lifting stations, and wastewater treatment facilities. The GTZ and KfW components are implemented on the bases of a cooperation agreement, mutually supported and sponsored by the German Federal Ministry for Economic Co-operation and Development (BMZ).

1.2 Overview of the Guideline

The first activities on preparing this Guideline were the survey and assessment of existing conditions of six WW&D companies (implemented at the end of August 2005). The purpose of the survey is to develop an understanding of what exists, knowing what they have, and situational awareness and on this basis formulate a plan of what should exist and prepare. The survey was in turn borne out of the recognition that there is no AD System of the companies which should have to carry out long time ago. However, the fact that AD System do not work as it should, and it is not to realize as good tool for achieving the missions, visions and values of the WW&D companies, remains a big question. Also, there is a need to look into the future, into the challenges that the companies will have to cope with both in terms of the demand of governmental agencies at all levels and the aspirations of their customer as well as community and put these to bear on how the WW&D companies gather, process, store, retrieve, and transmit their asset information while ensuring their time, obligation and responsibility. The survey thus was viewed as the initial step in the process of formulating a CDP. Once the CDP fulfilled, it will then be critically reviewed, its strengths and weaknesses more thoroughly uncovered as well as the requirements, opportunities, and constraints for improvement more clearly defined. An important element of the CDP will bring the WW&D companies following nationwide processes of equitization and autonomy.

For Asset Management, the concerned companies need to base the assessment of present conditions, the analyses of current trends, and the future projections on a broad range of asset information serving wastewater system. Such information is not only required for long-term asset planning, but also for routines Asset Management tasks. Although, there are many policies and procedures regarding the financial facet of asset which are implementing for each WW&D company, no policy or procedure for the other technical aspect of asset such as Asset Planning, Asset Investment, Asset Documentation, etc.

Different WW&D companies use different methods of information gathering, different formats for data storage, and different updating intervals. In fact, the asset information sometime did not gather among the related companies and departments which were involved in wastewater management. This practice does apply not only to the technical sectors (e.g., water supply, drainage, sewerage, pump station, wastewater treatment plan, etc.), but also to the governmental agencies concerned with many aspects of economics. It is considered a major obstacle for the integrated approach pursued by the WWM project. Only if different departments of WW&D companies use Asset Information from the same database, they would be able to integrate their planning and management endeavors effectively.

Traditional paper archives which store information in reports, tables, drawings and maps, are difficult to access and update, vulnerable to damage and loss, and inefficient with regard to data recovery and data analysis. An AD System based on standard PC-based computer technology would be capable of storing large amounts of text data, numerical data and drawing data without all these disadvantages. Such a computerized database would allow for interactive processing of these data, thereby facilitating the execution of the integrated approach. It has recognized the importance of computerized information systems and supports a number of WW&D companies in setting up the database. For this reason, the set up of an AD System which based on computerized Geographic Information System (GIS) should include in the scope of works of the WWM Project.

As indicated in the preceding discussions, the results were from a survey and assessment of functions and areas of key units/sections within the WW&D companies. Being on these, a general scheme of the AD System is established and the deficiencies and corresponding needs for improvement identified and defined.

On the basis of the foregoing, a proposed overall AD System concept is formulated and the functional specifications of its component systems are then defined. The functional specifications constitute the core as they describe the basic system components of inputs, processes and outputs. At the same time, the paper also identifies possibilities for computerization, the database requirements, and the security features that need to be incorporated.

The Guideline then puts forward an immediate action plan based on the priorities clearly defined in the aforementioned CDP.

1.3 Set-up of the Guideline

In this Guideline, the set up of the AD System with its general description including situational awareness, goals and objectives, approach and methodology, are described in part 2. In part 3, it is the setting up of the AD System including proposed organizational structure of the AD Unit, physical works and proposed procedure for gathering and continuously updating the asset information. How the AD System operates is explained in part 4. Then the Risk is defined in the part 5 during using the AS System in order to reduce them.

2. GENERAL DESCRIPTION

2.1 Situational Awareness

The term ”situational awareness” is all about having an accurate mental and physical mode of our environment, knowing what you have, fully comprehending the existing conditions in order to better situational analysis and good decision-making. To put in a nutshell, situational awareness will reduce risk, low situational awareness will only increase risk. There is a direct link between situational awareness and performance inside the WW&D company as described in the underneath figure (*Figure 1*). As levels of situational awareness increase, so does the WW&D company’s ability to process information, resulting in better performance. This can be critical in normal, as well as abnormal or emergency situations. The directors who are alert to developing situations will be more sensitive to react and aware of their implication. This will turn leads to more effective decision-making.

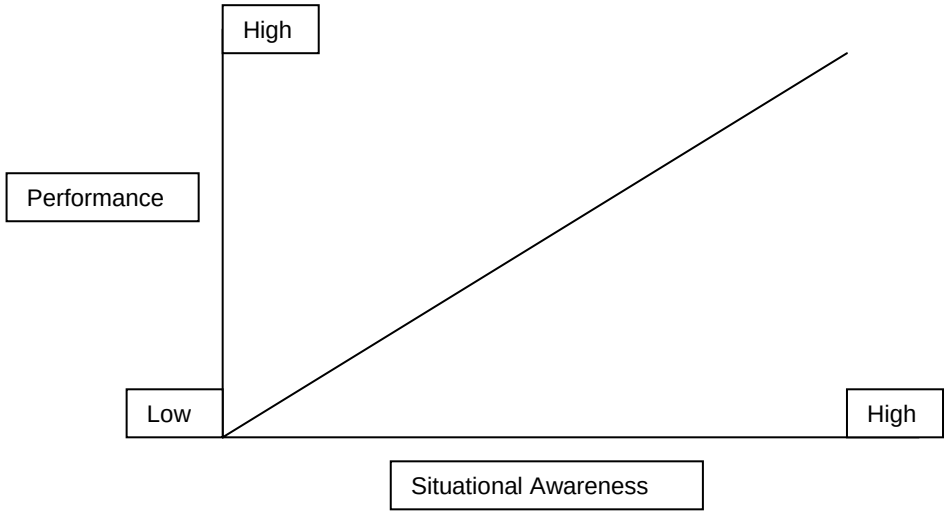


Figure 1: Relationship between Situational Awareness and Performance

2.2 Goals and Objectives of AD System

The main goals of establishing the AD System are:

- Fully situational awareness of the WW&D company;
- To enhance the formulation, implementation and review of Asset Management policies, strategies and plans;
- To facilitate the co-ordination and integration of Asset Management endeavours among different departments through sharing the information.

The specific objectives of the establishment of an AD System are:

- To set up a well structured database concerning document all fixed asset, which can be linked easily to other databases and can serve as a common source of data for companies' departments and other parties;
- To use the database in the Asset Management activities of WW&D Companies;
- To facilitate in the preparation of reports, tables, drawings and maps that result from the activities of the WW&D Companies;
- To prepare the WW&D Companies to take over responsibility for the management, update and O&M of the Asset.

2.3 Approach and Methodology of this Guideline

Documenting the asset feature with its policies and procedures that have been established which will save considerable time in the daily working. In this paper, it is necessary to provide a thorough understanding of the asset documentation process. This information should be written in a manner that will be understandable by both accountants and non-financial workers. *Therefore, the use of technical and other accounting-related terms should be kept to a minimum. Any accounting terms that are used should be defined.*

An AD System is only useful if it can be linked to other systems and is easily accessible not only for other units, departments, section, divisions, etc. within the WW&D company itself but also for other third parties or sub-constructors. It is therefore a prerequisite for success that the AD System of WW&D companies is set up in *close co-ordination with other parties*, which is setting up a system. Overlaps, gaps and inconsistencies should be avoided, and the same system and format should be used as much as possible.

Although the objective is to establish a common database, of which information is accessible to different parties, it is recognised that certain data shall be kept by the agency that collects the information because it is classified, sensitive or highly technical. The AD System analyses for drainage and sewerage system will mainly concern provision and analyses the data of drainage, sewers, pump station, pressure lines, wastewater treatment plan, household connection, septic tank, etc. at the serving area of each WW&D company.

3. SETTING UP THE SYSTEM

3.1 Proposed Organizational Structure and Staffing

The Company should establish an "Asset Documentation Unit" (AD Unit) and a Geographic Information System (GIS) for the documentation of assets and the recording of maintenance works. For this Unit, a special room should be ready, and budget was already allocated for the purchase of office furniture, computer hardware and software. The AD Unit should have some skilled computer operators, basic hardware and "off-the-shelf" software. The staff of the AD Unit works in close cooperation with the water supply and wastewater maintenance teams for planning and work recording purposes. Standard-operation-procedures (SOP) shall be established to facilitate the AD Unit work processes. Suitable staff needs to be recruited and trained for the proper application of the SOPs. SOPs shall be supplemented by "job-descriptions" and "CVs" and an overarching "quality management system" (ensuring that technical procedures are applied). Labor force, training, tools and machinery for operation and maintenance works should be adjusted in accordance to the WW&D company's O&M strategy.

3.1.1 Proposed Organizational Structure

The AD Unit should be establish with its staff come from several related professional departments in the WW&D company. There is a need of the people which are involved in financial, technical and managerial skills and experiences. Its tasks, functions and responsibilities should be defined, then put in a regulation of the AD Unit, submitted and approved by the Board of Manager in the WW&D company or by the other governmental agencies if necessary. Because asset is in closed relations with finance, the AD Unit should be directly under management of Financial Department with closed coordination of Personal and Administrative Department and Planning and Technical Department (indirectly management). Besides, this AD Unit should straightforwardly submit its report to the Director. The following figure will describe a simple organizational structure of this AD Unit.

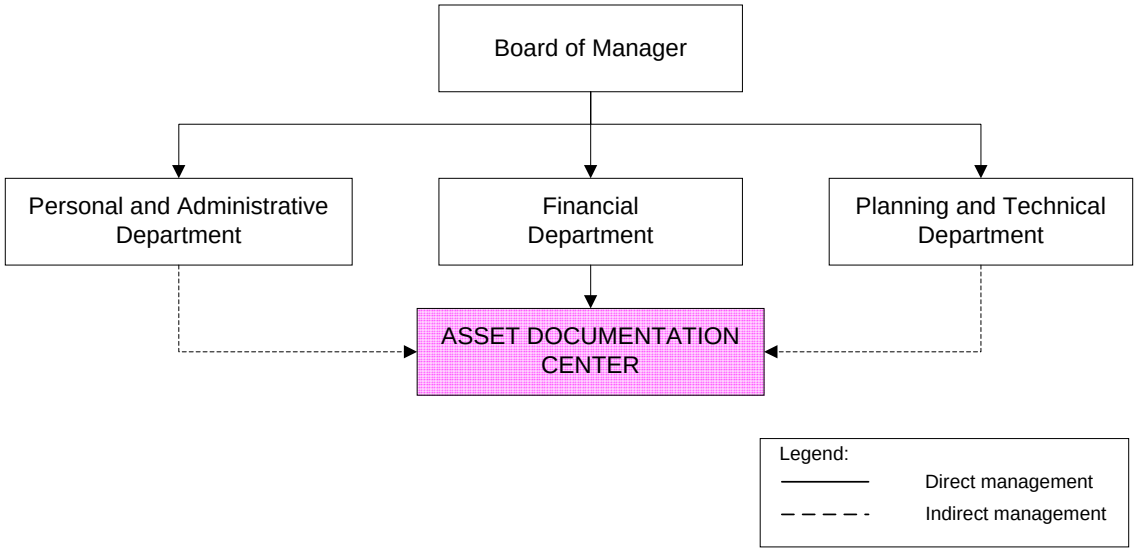


Figure 2: Organizational Structure of Asset Documentation Unit

3.1.2 Staffing

As mentioned-above, the staff of the AD Unit would consist of some experts from WW&D company. The specific Term of References (TOR) for this AD Unit has to prepare in combination of related professional departments in WW&D company then get approvals by the Director. On the other hand, these experts should be recruited, who should be good experienced in GIS, CAD, technique and database programming and finance in some required positions. At present, as GIS is still rarely used in Vietnam, chances is very small for finding available experts in GIS, and recruiting a database specialist then training for available staff of the WW&D company seemed the best choice.

The WW&D company should establish a Training Need Assessment and prepare a Training Plan including a training program and budgeting annually. This budget has to be included in O&M costs.

Field staff
Depending on the scale of service area as well as the WW&D company itself, they should establish a surveyor team who have to do field work everyday. These persons have to gather all information around their WW&D company's asset. Their works should be to implement field survey, measure on/under the street, check tools, equipments, machines and facilities, etc. They, also, need to be trained how to measure in/under the field, classified asset's priorities and defined their time schedule on out-door working. As the result of that, the WW&D company will have a lot information about everything which need for their business's activities.

Office staff
Each WW&D company needs one or two experts implementing all in-door works which includes choosing, inputting and preliminary analyzing data of Asset. The experts will receive information from field staff, select the best one then put it in the database. After that, the experts could propose their key findings and initial recommendation directly to the Director and other related units/divisions/sections for their decision-making.

Staff Recruitment and Job Description
At least two local experts are hired, besides a main operator of the GIS system, who is responsible for all maintenance and back-up of the computers. In all Asset Documentation activities, the experts of WW&D Company have to works together closely with many departments outside the company, such as: DoNRE, DOC, DOF, and other third parties and constructors, etc. especially with the head of the GIS section of DoNRE. Also part of the work may be subcontracted to DoNRE or other GIS solution providers.

A more detailed recruitment policy in line with exact and detailed job descriptions for every post in the AD Unit need to be developed to improve the suitability of new assignments and thus reduce future training needs. Job/Position descriptions can avoid overlaps in implementing duties and help the staff to understand roles and responsibilities and thereby increase effectiveness and productivity. Job/Position descriptions have to depend on tasks, functions and responsibilities of each position who work as a staff member of the AD Unit. Job/position description for typical AD Expert/Staff which need to elaborate by related departments inside WW&D company and approve by its Director. The Job/Position Description could be finding in the *Annex 1*&2 as example.

3.2 Implementing Physical Works

3.2.1 Office

The company should prepare an office for this AD Unit with some shelves for storage asset documentation which are arranged in order so that each staff could find the information

easily. Furniture consisted of two desks with chairs, a drawer table for the maps, and one bookshelf for arranging documents, small printer and utensils or office stationery.

3.2.2 Paperwork

It should require preparing unique form in order that the filed and office staff could fully understand each other when they hand over their work. It, therefore, need an approval of Director of the WW&D company to the form formulation of Asset Documentation.

3.2.3 Hardware

The hardware purchased was based on a two-person full time occupation of the system.

The computer hardware purchased consisted of the following items:

- Two computers: The capacity processor will prove its use when analyses with extensive databases are being done, a large hard-disk capacity will be needed for the data storage, and the big size monitor is especially useful during digitising.
- One A1 size colour printer: This plotter/printer will be mainly used for the printing technical drawings.
- One A3 size colour printer: This printer will be used for smaller drawings, maps, reports and other routine print jobs on A3 and A4 size. The A1 printer is not very suitable for that kind of jobs because it is merely designed for printing from the roll feed.
- One External ZipDrive for backups: The ZipDrive will be used for regular data backups of the whole office.
- One serial lap link cable for easy data exchange, and printer sharing.

During the preparation, the purchase of a scanner was also considered. The main use of the scanner would be the scanning of the drawings and maps, as basis for the digitising of the base map and drawings.

3.2.4 Software

The purchase of the software to be used for AD System was strongly dependent on the system already in use at each WW&D company and the format of their data so that the unique format should be designed for each WW&D company. It will gradually find out in the AD Manual which will prepare then.

As MapInfo software is very common and cheap so it seemed that the best choice is to use MapInfo software for base map. Also, for easier data integration and experience exchange, and a quicker start of the digitising. Besides the software, database management software and other supporting software is needed. Below follows a list with a short description of the main software installed on the system:

- Microsoft (MS) Windows XP, a common operating system already in use at many offices.
- The recently released newest version of MapInfo. MapInfo itself already integrates all the functions of a GIS system, like digitising possibilities, geographical analyses, database management and map production and reporting.
- MapBasic, a supporting software for MapInfo meant for automation of analyses and the development of application programmes.
- MS Office, an integrated software package, providing most of the software normally needed in office use, including database management systems. The programmes from MS Office mainly used by the GIS section are:

- MS Access, the database management programme, integrating possibilities of relational databases, application building, full Object Linking and Embedding (OLE) support (which make map integration possible), reporting, etc… MS Access mainly becomes useful when big amounts of data are involved, needing routine processing and reporting.
- MS Excel, a spreadsheet based calculation programme, with also some database functions integrated. Also here maps can be integrated via MS Map, an OLE application.
- MS Word, a word processor for the preparation of reports.
- MS Photo Editor, for the scanning and preparation of maps, and eventually pictures.
- Vietware, a special software to support Vietnamese writing.

3.3 Proposed Procedure on Asset Documentation

After the organizational structure, staffing and physical activities fulfilled, the following procedure is prepared for continuously gathering and updating data of Asset Documentation.

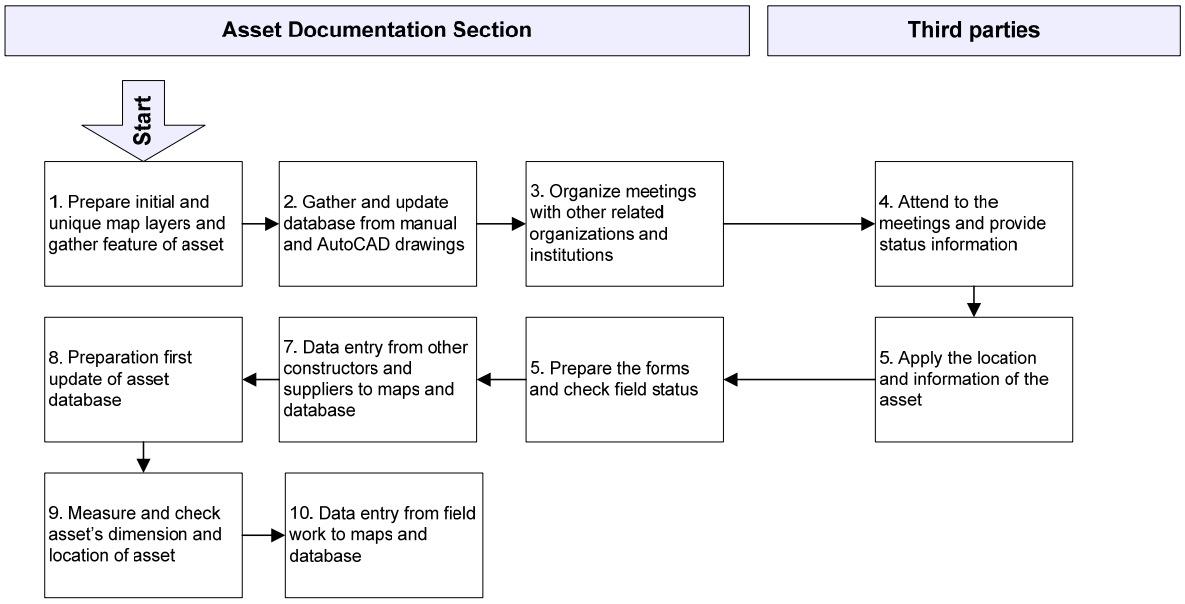


Figure 3: Proposed Procedure on Asset Documentation

In brief, all procedures on Asset Documentation could be described as five actions as follows:

Action 1: Initial preparation of data
Transfer of the asset database to the companies, in case they possess computers. This step will be implemented in-door which based on GIS software. A schedule, equipment and staffing plan will be designed.

Action 2: Update based on existing information
Based on the information of the manually or AutoCAD drawings, and the information stored in the archives of related bureaus and departments, other constructors, etc., a first update of the database will be made.

Action 3: Meetings
Some of the constructions are done "unofficially", meaning without reporting to the administrative institutes. Therefore a meeting should be organized to gather information on the latest state. Information gathered during the meeting should again be used to update the database or to serve as input for the next step.

Action 4: Field work
Check of the accountability of the database in the field. Again the data should be used to update the database.

The following figure is described the procedure on Asset Documentation. In order to perfect working of the procedure, it is assumed that (i) the staffs who carry out the AD tasks are good capacity and their skills and experiences meet the tasks' requirements and (ii) the equipment facilities which serve this tasks are available. After the procedure completed, the next activities will be described as next part in this guideline regarding to set up the AD System and its working activities in practice.

Action 5: Introduction of Continuous Update Procedures
After the digital database has been achieved for the WW&D Company, its continuous update should be safeguarded. This is the moment to introduce the streamlined procedures for updating the database.

Because this procedure includes harmonizing activities with other governmental agencies, there is a need of fully understanding the key functions and result areas of each external State body. The *Annex 3 w*ill describe the quick outlooks of them.

4. SYSTEM OPERATION

4.1 General System Operation

The proposed AD System design basically retains the existing system and practically all the information clusters comprising it. What the proposed concept does, however, is to put the various AD System elements in a more logical relationships pattern. The advantage of AD System is that future users are already familiar with it, such that, if ever, orientation and training will be reduced to the minimum. And the outputs of the AD System are expected sources for the activities which are the orientation and sources for long-term and medium-term development plans and programs.

In addition, the foregoing plans and programs then serve as basis for the operation of the Financial Management activities, whose basic outputs are the annual, quarterly, monthly and routine budgets of the activities, which shall henceforth be based on clearly benchmarks as much as the amount of money that are available. These budgets will then serve as interim monitoring and control instruments for the performances of the other works. The final, overall monitoring and control mechanism will be integrated with the SOP, as will be discussed later in other Guideline and Manuals.

The following figure will describe information processing at AD Unit.

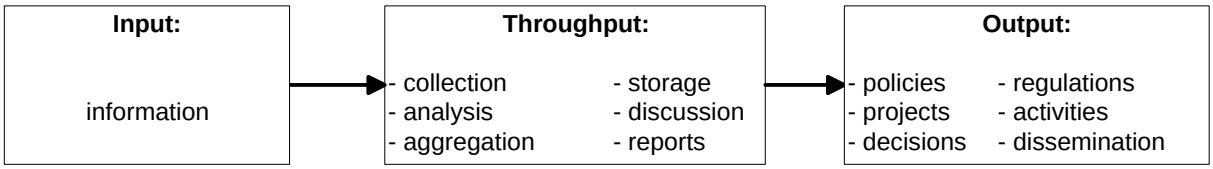


Figure 4: Information Processing

Together with other inputs, such as budgets, human resources, office facilities, etc., the performance of the organization depends on *the effectiveness and efficiency with which it is able to collect, process and distribute information*. The collection, storage, analysis, discussion, aggregation and reporting of information is an internal matter. But for the collection of data and information as well as further disseminating the information, the organization has to be in touch, communicate with many organization and people.

4.2 Input

In order to input the information in a database, the following data should be gathered:

4.2.1 Basemap

Main purpose of the basemap is to serve as a common geographic reference for asset management, thematic maps, ledgers, maps of master plans, etc. If all institutes use the same base-map exchange of data will be much easier. Therefore it is very important that all the institutes have access to the base-map, and that the information in the base-map is accurate and up-to-date. It will be a major job to keep the basemap up-to-date, and provide all concerned institutes with the latest version.

Next step in setting up of an AD System is the preparation of a basemap which covers the location and service areas of WW&D company. The basemap should be prepared by the AD Unit and together with other third parties such as DoNRE at its provincial level which was considered desirable to avoid double work and incompatible databases. Therefore, close co-ordination with other third parties has been of major importance. After finalisation of the base-map a start will be made with the preparation of asset ledgers and integration of data, and data available via the newly started co-operation effort. And each company itself also had plans to start digitising the base-map.

The base-map consists of at least four layers. Below a short description of each layer is given, including update needs:

- Topography: This layer consists of contours and several kinds of elevation points. Topography is not expected to change rapidly. New information on topography could be available at the DONRE.

- Administration: This layer consists of administrative boundaries up to the level of the wards/communes, polygons for districts/city and communes/wards and locations and names of administration offices. Changes in this layer are very rare, and easily updateable. Problems will arise with data connected to this layer, in case of a change, because many data are stored on administrative level. It also is advisable to introduce a standard official identification number for each administrative union.

- Hydrology: This layer consists of rivers, ponds, moats, irrigation channels and water management structures. Changes for this layer will mainly include disappearance and appearance of lakes, and changes in the irrigation system. Update would involve close coordination with the DARD and WW&D Companies themselves.

- Transportation: Main features of the transportation layer are roads, rail and supporting facilities (bridges, terminals). In fact the transportation layer can be seen as a summary (same items, less information) from the road ledger of Department of Transportation and Bureau of Transportation. Update of this layer would mainly involve requesting the final summary from above mentioned department.

4.2.2 Existing Wastewater Asset

The existing wastewater asset of WW&D company include their current asset which are serving for wastewater services. It includes:

- Septic Tank
- Connection
- Drainage and Sewerage
- Manholes

the information should gather:
- Dimension
- Location
- Age
- Condition

4.2.3 New Wastewater Asset

New wastewater asset is newly-build by the KfW project's investment. This information is very easy to gather from other construction company. It including:

- Interceptor
- Sewers
- Pumping Station
- Pressure Lines
- Wastewater Treatment Plan

the information should gather:
- Dimension
- Location
- Age
- Condition

4.2.4 O&M

The O&M information is the information about the staff's activities on operation and maintenance the asset. It Include:

- Operation
- Maintenance

the information should gather:
- Real-time schedule of activities for O&M
- Level of O&M
- Human Resource for O&M

4.2.5 Asset Ledgers and Records

The asset ledgers and records developed by the WW&D Company include ledgers and for Transportation and record for Drainage and Water Supply. Institutes closely related to these ledgers are the DOC, WS Company, Department of Transportation, Bureau of Transportation and the URENCO. The WW&D Company will be responsible for overall coordination.

Asset ledger should be gathered in unique form which have to approved by the Director of the WW&D Company. If any codification already exists for the wastewater facilities elements, it should be integrated in the ledger and following four layers as mentioned above.

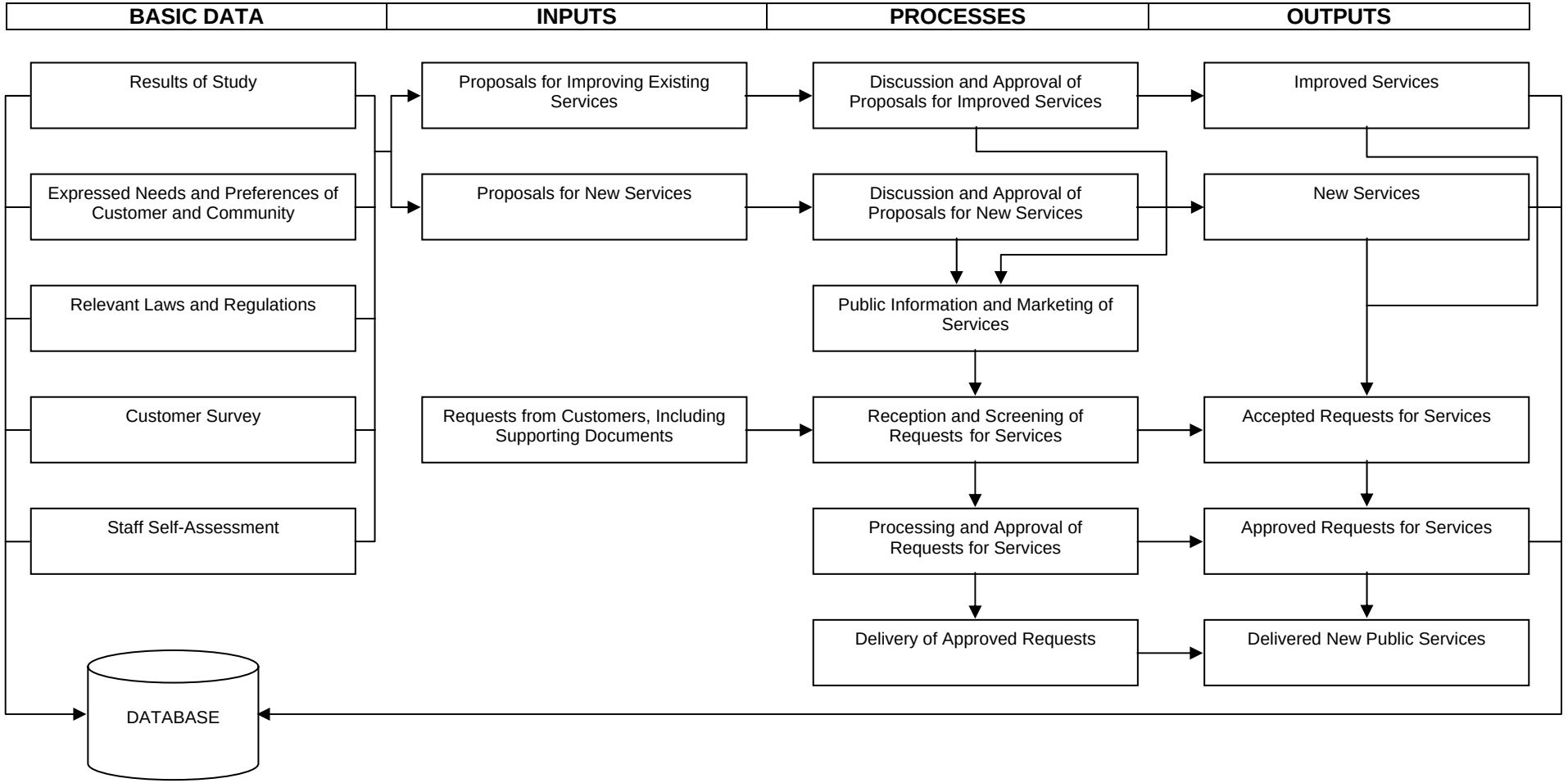
4.3 Information Processing

4.3.1 New Wastewater Asset

The service delivery of new wastewater asset has likewise been identified as an important public service. This service will be described later, and should accordingly be designed. The service delivery is also not presented as a separate system because it has already been integrated into the CDP and can therefore be treated as part of public services delivery or on the other hand, is integrated with the Public Service Delivery.

An overview of the system is presented in *Figure 5*.

Figure 5: The Information Processing of New Wastewater Asset



The basic data used as basis are:

- Results of study
- Needs and preferences of customers and community
- Laws and regulations pertaining to the delivery of services

The foregoing data were then processed and packaged into a proposal for the establishment of this Guideline and submitted to and approved by the Director and WW&D company. The proposal included the institutional arrangement for the management of the AD Unit and identified the services to be offered, the criteria and requirements for the approval of each type of service based on applicable laws and regulations, the fee, and the length of time for processing. All these were further articulated in a Manual for each WW&D company.

Under the circumstances where the AD Unit is already operational, the foregoing basic data may still be used. In addition, important sources of basic data would be the following:

- Customer Survey
- Staff Self-Assessment

Combined with the other basic data, an office form approved by the Director is the basis for proposals for the improvement of existing services or the inclusion of new services.

The inputs are as follows:

- Proposals for improving existing services
- Proposals for new services
- Requests from customers, including supporting documents

The processes involved are as follows:

- Discussion and approval of proposals for improved services
- Discussion and approval of proposals for new services
- Public information and marketing of services
- Reception and screening of requests for services
- Processing and approval of requests for services
- Delivery of approved requests

The outputs are as follows:

- Improved services
- New services
- Approved requests for services
- Delivered administrative services

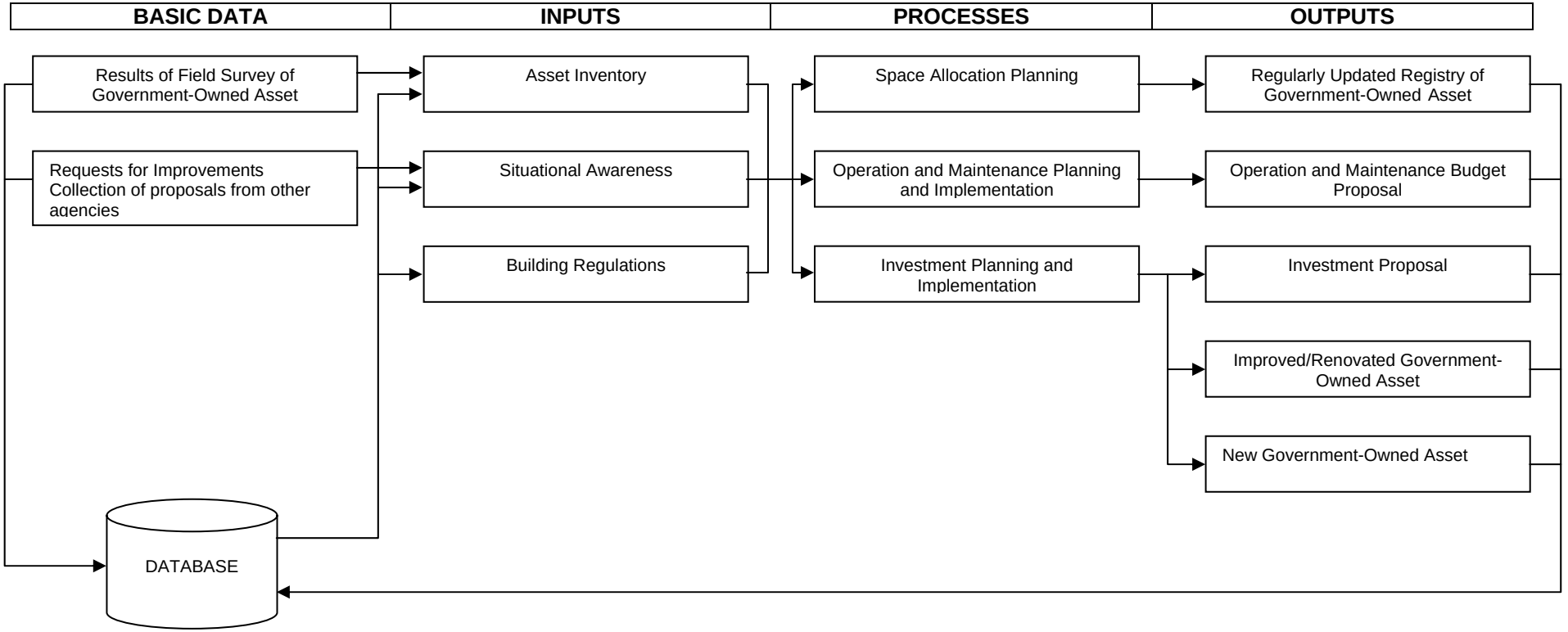
4.3.2 Existing Wastewater Asset

Existing wastewater asset is Government-owned constructions refer to the premises used by the City People's Council and City People's Committee, as well as bureaus and other offices. The administration of these constructions, as mentioned, is under the Office of the People's Council and People's Committee. Proposals for maintenance, renovation, and construction of new buildings prepared by the said office are however subject to the technical review of the related professional departments and bureaus before these are elevated to the People's Committee and subsequently included in the yearly budget proposal.

The main purpose of the system is to ensure that all government-owned buildings are properly accounted for, their uses are in accordance with laws and regulations, are generally fit for occupancy, and are used optimally. Another concern is to see to it that all city government bureaus and offices are allocated adequate space with reasonably conducive physical working conditions.

An overview of the system is presented in *Figure 6*.

Figure 6: The Information Processing of Existing Wastewater Asset



Following are the key functional features of the system.

The basic data needed by the system are:

- Results of field survey
- Requests for improvements from all level of State hierarchy
- City population distribution

The inputs are:

- Situational awareness
- Asset inventory
- Building regulations
- Service demand
- Inventory of existing facilities, tools, and equipment
- Historical investment cost
- Historical operation and maintenance expenses
- Registry of existing customers
- Service demand

The processes involved are:

- Space allocation planning
- Operation and maintenance planning and implementation
- Investment planning and implementation
- Service coverage planning
- Public information and marketing
- Operation and maintenance planning and implementation
- Investment planning and implementation
- Tariff setting
- Billing and collection

The outputs are:

- A regularly updated registry of government-owned asset, with details on location, design, present conditions, uses, users, ancillary facilities and equipment
- Operation and maintenance budget proposal
- Investment proposal
- Investment budget proposal
- Improved/renovated asset
- New asset
- New customers and updated customer registry
- New/improved facilities and expanded services
- Service coverage area
- Tariff structure
- Bills and revenue

4.3.3 Data Sharing

As a starting point, the database of WW&D Company is being used. The objective is to improve the accessibility and quality of data by clarifying and if necessary adjusting the data entered, the data definitions and the sources of the data.

An assessment of the available data will be made, and after that a more detailed plan will be made. Roughly it can be expected that the database will provide digital information in order to assist Asset Management activities, including:

- Asset Planning
- Asset Investment
- O&M the asset
- Quality Management

4.4 Output Specification

Output of an AD System, besides raw analysis results, normally consists of drawings, maps and tables. Although the MapInfo software has a simple reporting feature, for printing database information, it is normally necessary to use database software, like MS Access or MS Excel. The rest of this part will concentrate on the printing of different kinds of drawing and maps.

4.4.1 Asset Location Maps/Drawings

Standards should be made for the printing of maps/drawings on different paper sizes (A0, A1, A2, A3 and A4). For all the sizes a portrait and a landscape setup should be prepared. Saving of these standards can be done in special workspaces, only containing “empty” layouts.
Each standard should already contain the following items:

- An empty main frame for the location of the map;
- On the bottom next to each other two boxes containing:
- The title, and eventually the subtitle;
- The legend
- A north arrow
- A scale-bar, or a scale indicator
- Name of the project task for which the map is meant
- Filename
- Date of the print
- Etc.

In Mapinfo, it is difficult to place scale bar (should be in map) and legends next to each other. It is probably best to create a standard legend also for base-map items, which will normally serve as the background of the thematic maps.

Automatisation of date and scale indicators can be done with MapBasic.

Different types of maps/drawings that will be printed include:

- Check plots
- Base-map prints
- Thematic maps
- Drawings

Check plots will normally include of maps with only digitised lines, for the checking of the digitising work. As these are internal plots, no sophisticated layout will be needed.
After the base-map is finished, the result should be reprinted per map sheet/drawing, and stored in the drawer table.

Thematic maps are in fact base maps printed in softer colouring as a background, with the themes of the map in bright colours. Each thematic map will have its own specific legend.

4.4.2 Asset Data Form

Following table is proposed form for the output data of Asset. It should revised by the staff of the newly-established AD Unit, then submit and receive approval by the WW&D company's director.

NAME OF ASSET				
General information				
Description		Manufacturer		**Asset picture or AutoCAD drawings**
Brand name		Model		
Location		Category		
Department		Warranty type		
Warranty Expire		Asset number		
Section		Condition		
Status		Assigned to		
Current value		Replacement cost		
Serial number		Quantity		
Insured by		Policy		
Size		Shape		
Number made		Year made		
Made of		Colour		
Group		Taxable/Insured		
Code		Lease Description		
Lease begin		Lease end		
User		User currency field		
User date				

Sample picture

Purchasing information	
Date purchased	
Total cost	
Depreciation information	
Business use (%)	
Depreciation method	
Life (in year)	
Placed into service	
Salvage value	

Depreciation data (straight-line)			
Year ending	**Depreciation for year**	**Total depreciation**	**Remaining book value**

Table 1: Asset Data Form

4.4.3 Storage and Reports

For storage of all the maps/drawings, it is important that from the beginning a storage system should be setup already, and all the maps/drawings should be given its own code. It would be most perfect, if a database system would be created immediately to organise the storage.

4.5. Database requirement

4.5.1 Approach to Database Development and Management

Whatever can be gleaned from the summarized functional specifications of the proposed AD System is that some of the clusters and even systems within some clusters are for the use of the WW&D company, to some extent, should even be accessible to the general public. It is thus proposed that the AD Sysetm for WW&D company adopts a core-periphery approach to

management information systems development and correspondingly to database development and management.

Under the approach, generic data (those that will be used across all or most of the WW&D company) are stored in a 'core' database that is centrally located and accessible to all. Publicly available data, such as population, customer or community statistics, would fall under this category, and so are procedures for availing of the wastewater services, ledgers, approved plans and programs, decisions, and the like. Specific data, those for the use of a limited number of organizational units or are sensitive, are then developed and managed in peripheral databases.

A simple representation of the approach is presented in *Figure 5*.

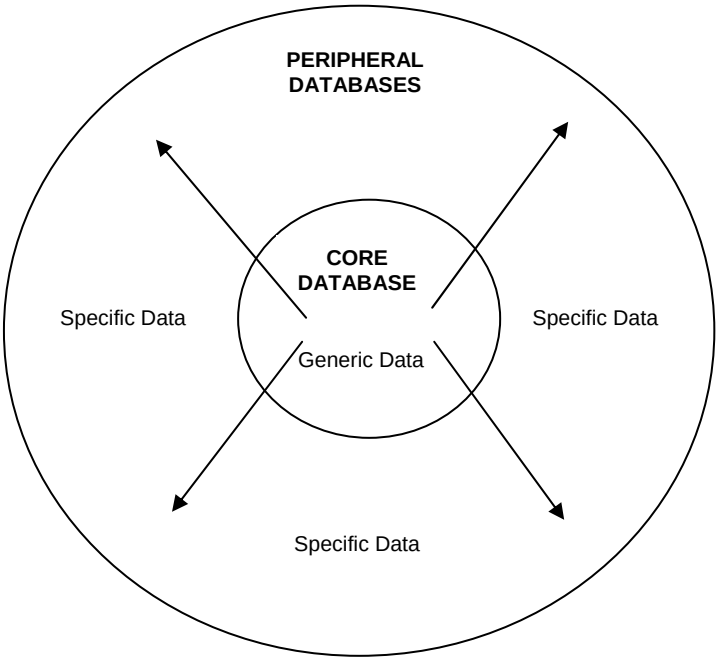


Figure 7: A Core Approach to Database

The roles of Peripheral Databases are as follows:

a. Make use of the generic data in the Core Database
This is not an option but a must for all the systems to refer to generic data in the core database. .

b. Alter/update the generic database
This should be done according to pre-defined scope of authority and protocols agreed to by all concerned.

c. Provide inputs to the generic database
Also, this should be done in accordance with government-approved information disclosure policies and Guideline. Continuing from the preceding example, the WW&D company is then expected to provide the Core Database with the updated wastewater ledgers.

d. Serve as a back-up to the Core Database
As original sources of some information, peripheral databases are expected to replenish lost or compromised data in the Core Database. Following access protocols, they should be able to serve as substitutes when the Core Database is down.

e. Control specific data items
Data items that are not for the use of everybody or are sensitive are expected to be protected within the designated database.

4.5.2 Core Database

Following the foregoing concept, the key features of the Core Database are presented in this section.

a. General Description
As mentioned, this database will contain generic data that will be used across the city government organization. Its development, however, shall initially focus on the following:

b. Support to CDP
The database shall serve as the repository of all the data and information as well as interim and final results of the ongoing CDP process and shall therefore focus first on supporting the CDP cluster as described in this paper.

c. AD Unit computerization
Application/request forms, processes and procedures, requirements, and fee schedules of administrative services offered in the AD Unit will be stored in this database and made accessible to the public through the proposed city web site.

4.5.3 Administrator

The AD Unit is proposed to act as administrator of the Core Database. The main rationale is that this office is neutral and it acts as the link between governmental departments and bureaus and other organizational units and the People's Committee. Also, it has been proposed to manage the database on a day-to-day basis, and the said information is foreseen to be mainly dependent on the Core Database.

An information specialist attached to this office may be designated as the day-to-day database supervisor with the following functions:

a. Database planning
This will involve working with other government officials to formulate the schema or description of data that should be stored in the database. He/she will also be involved in selecting the database management system (DBMS) software and hardware.

b. Database implementation
This refers to the process of creating the database to conform to the specifications of the DBMS, as well as establishing policies and procedures for database use.

c. Database operation
This will include orienting database users and providing assistance in the use of the database when needed.

d. Database security
This will mean safeguarding the integrity of the contents of the database.

The database supervisor may also be involved in the development of the Peripheral Databases.

4.5.4 Access

Access to the database will be unrestricted. The database may even be made available to the general public through the proposed city web site. Governmental departments, bureaus and offices and other third parties as well as sub-constructors, etc. will be connected to the database through a local area network.

4.5.5 Security

For safeguarding the integrity of the database, entry of new information or alteration to existing information shall be done only by authorized parties and done through pre-established policies and procedures.

5. RISKS MANAGEMENT

The main risks/deficiencies may be happen which detected in the existing AD System that needs to be addressed in the proposed new setup is as follows:

5.1 Database fragmentation
There are indications that various information systems mentioned in the preceding section are segregated, following strictly what might be called the boundaries of organizational 'boxes'. As a consequence, each system generates its own basic data and maintains its own database, even if for reasons of efficiency and effectiveness a common database for certain systems are not a matter of choice but a necessity. One reason is to avoid duplication, another is to achieve synergies so that one form of assistance reinforces rather than negate or lessen the beneficial impact of others.

5.2 Information overload
Some WW&D companies, by virtue of their functions, are expected to maintain several types of unrelated information. This is an issue that a new AD System setup may not be able to adequately address as it is more under the purview of organizational rather than information-system design. The first step in finding a solution to the problem, therefore, would probably be to separate the two unrelated functions of organization, on the one hand, and social affairs, on the other.

5.3 Inadequate feedback loop
The feedback loop is generally defined as the path for signals from the system to a control mechanism, and from a control mechanism back to the system. The control mechanism is a device that uses the feedback signals to evaluate system performance and determine whether corrective action is necessary. Some component systems of the AD System already incorporate a appearance of both the feedback loop and the control mechanism. A case in point is the financial management system, which, according to existing procedures, should generate annual, quarterly, and monthly budgets. Thus, in so far as the preparation of the next budget proceeds from a review of the implementation of the one preceding it, then this should already serve the need for feedback and control. All these could prove inadequate, however, if the review process only focuses on quantitative variances, such as under- or over-disbursement of budget allocation, and not on the extent of accomplishments of the higher, more often qualitative objectives for which budget items have been allocated in the first place.

5.4 Absence of information integration
Ultimately, the effectiveness of an AD System will be based on whether it helps the WW&D company's director in making the right decisions and taking the right actions. Issues requiring decisions or actions are however almost always multi-dimensional, their proper appreciation

needing of several perspectives afforded by different types of information coming from different sources or generated by different systems, which separately may not have any significance. At present, there are no indications that there is a level in the existing AD System that provides for routine and automatic information integration to support the decision-making functions of the directors.

Annex 1: Detail Job/Position Description

JOB/POSITION DESCRIPTION

Started date: …/…/…
Ended dated: …/…/…

POSITION TITLE	**Asset Management Officer**
WORK AREA	
PPOFESSIONAL	**Technical Services**
CARIEER LEVEL	
POSITION NUMBER	
RELATIONSHIPS	
RESPONSIBLE TO	**Head of Asset Management Unit**
RESPONSIBLE FOR	**No subordinate staff**
INTERNAL LIAISON	
EXTERNAL LIAISON	

PURPOSE OF POSITION:

The purpose of the position is to contribute to the effective management of a particular class of assets within the wastewater systems such that the assets deliver their required levels of service over the long term, at an appropriate level of risk, for the lowest possible whole-of-life cost. This will be achieved by monitoring the performance of the assets and implementing effective operations, maintenance, condition monitoring and renewal strategies.

EXTENT OF AUTHORITY:

DELEGATIONS:	Nil
ORGANISATIONAL RELATIONSHIPS	(This refers to the level of independence of the role and may include wording such as - "When dealing with complex matters, the position has independence in decision making, however for more complex issues, the position is subject to general supervision with considerable freedom to interpret stated Guideline in order to achieve clear objectives as set down by Council policies and procedures" – DELETE if not applicable)

CORPORATE VALUES AND ACCOUNTABILITIES:

Our strategic directions and day-to-day activities are guided by the following values and accountabilities:

- Customer service
- Respect for others
- Responsiveness and accountability to the community
- Commitment to ecologically sustainable development
- Honesty and fairness
- Equity and access
- Open communication
- Cooperation and understanding
- Economy and efficiency
- Excellence, innovation and leadership

• Recognition of the skills and commitment of others

Ensure all work is performed to meet the safety, environmental and legislative requirements and responsibilities
Efficient and effective utilisation of resources as allocated under the level of responsibility for this position.
Provision of quality customer service.

VALUES:

- Working as a team
- Enjoying our work
- Respecting one another
- Communicating openly
- Acting with integrity

POSITION SPECIFIC ACCOUNTABILITIES	OUTCOMES EXPECTED
To assist in monitoring the performance of the assets in terms of a number of social, environmental and economic parameters including quality, quantity and reliability of service, safety, environmental impact and cost. The position would need to have: • A thorough knowledge of the assets with a comprehensive asset register including all necessary attribute data to facilitate analysis • An appreciation of the operability and maintainability of the assets. To assist in developing and implementing an operations strategy that ensures effective and efficient service delivery. To assist in developing and implementing an effective inspection, maintenance and condition monitoring strategy. To assist in developing and implementing an effective renewal strategy to ensure the long-term sustainability of GCW's service delivery.	A range of relevant measured and reported on a monthly basis with performance issues addressed in the relevant strategies. A documented operations strategy with all activities budgeted. A documented maintenance strategy with all activities budgeted. A documented renewals strategy with all renewal expenditure. Monthly capital expenditure forecasts at Cost centre / Function level to facilitate works program management.

Note: The accountabilities and outcomes shown above are limited to the particular class of assets to which the Officer is assigned. Reporting, strategy documentation, Service Level Agreements, financial projections, project management documentation and capital expenditure forecasts shall be conducted in accordance with Quality Management System procedures

KEY SELECTION CRITERIA:

1 A tertiary qualification in engineering (or equivalent).

2 A high level of knowledge and experience in the design, operation, maintenance and renewal of water and wastewater infrastructure.

3 A sound knowledge of asset management principles with an ability to develop robust asset management strategies through analysis of performance data, local conditions, business needs, alternative solutions, benefits and costs.

4 A high level of motivation and initiative with a willingness to investigate and resolve issues proactively and with limited supervision.

5 Excellent interpersonal skills with an ability to communicate with team members, field staff, administrative staff, management, and customers as required.

6 Excellent written communication skills with an ability to produce reports, project plans, and letters to a high standard.

POSITION DESCRIPTION ACCEPTANCE

This position description is subject to change from time to time as WW&D company may be developed or restructured. Any such adjustment of duties shall be the subject of discussion with the position incumbent.

Occupant:_____ Date: _____
(To be signed by occupant upon appointment to position/amendment to Position Description)

Annex 2: General Job/Position Description

Function:	**Asset Documentation Expert**
Tasks:	• Technical Proposal preparing on Asset Documentation • Involved in all aspects of GIS software solution implementation • Involved in GIS database establishing and related mapping issues • Etc.
Required Skills/Experience	• Computer using, GIS, Survey, mapping or related degree • Excellent in GIS software such as MapInfo, ArcInfo, ArcGIS • Knowledge in Database • Etc.

Annex 3: Key Functions and Result Areas of Units Comprising the City People's Committee

Name of Unit	Key Functions	Key Result Areas
Office of the People's Council and People's Committee	• Set up the annual, quarterly, monthly, and weekly work program of the People's Council and People's Committee. • Follow-up on the implementation of city plans and programs. • Collect information and assess problems requiring the attention and decision of the People's Council and People's Committee. • Maintain the city archives. • Manage all documents received and issued by the People's Council and People's Committee. • Review all documents submitted for decision of the People's Council and People's Committee. • Organize the meetings of the People's Council and People's Committee. • Manage the emulation and rewards program of the city. • Provide day-to-day supervision to the One-Stop Shop	• Annual, quarterly, monthly, and weekly work program of the People's Council and People's Committee • List of issues/problems that need attention of the People's Council oand People's Committee • Final draft of proposals and decisions for approval by the People's Council and the People's Committee • Systematic and organized compilation of documents received and issued by the People's Council and the People's Committee • Well-maintained, up-to-date city archives • Systematic and organized compilation of minutes of meetings of the People's Council and the People's Committee
Bureau of Planning and Finance	• Prepare long-term, medium-term, and annual economic development plans • Prepare investment programs. • Coordinate and monitor development activities. • Implement state policies on finance, price, and commerce. • Prepare annual, quarterly, and monthly city budgets. • Guide state agencies on matters pertaining to the implementation of laws and regulations pertaining to financial management and accounting. • Conduct training courses in financial management for its own staff, wards and communes.	• General Plan for Social and Economic Development • Medium-Term Economic Development Plan • Annual estimate of revenue and expenditure • Annual budgeting Guideline • Annual development and investment programs • Consolidated annual city annual budget proposal • Quarterly budgets • Monthly budgets • Training courses • Competent city, ward, and commune finance and planning staff
Bureau of Organization and Social Affairs	• Recommend appropriate organization structure of all city government offices, wards, communes, state-owned enterprises. • Conceptualize and implement institutional strengthening measures for all the foregoing offices and agencies. • Recommend working relationships between wards and communes, on the one hand, and city government agencies, on the other. • Define the administrative boundaries of wards and communes. • Organize elections. • Organize training programs for city government, ward, and commune officials and staff. • Settle issues on labor and employment. • Prepare plan for labor distribution or use. • Provide guidance on the development and implementation of labor employment programs.	• Organizational development plans, programs, and annual investment budgets • Human resources management plans, programs, and investment budgets • Labor employment/deployment and productivity statistics • Systematic and organized compilation of labor laws and regulations • Decisions on labor disputes • Social welfare plans, programs, and annual budgets • Statistics on household income, employment, and poverty incidence • Poverty-reduction plans, programs, and annual budgets

Name of Unit	Key Functions	Key Result Areas
	• Coordinate the implementation of resolution of violations of labor laws and regulations. • Provide guidance on the implementation of policies, regulations, and criteria for recipients of social benefits. • Recommends to the People's Committee the issuance of certificates and decisions on levels of subsidy to various types of beneficiaries. • Exercise control on the list of dead soldiers. • Maintains the heroes' cemetery. • Coordinate the implementation of social welfare programs covering health, education/training, housing, tax exemption, and employment. • Implement policies and programs for the handicapped, orphans, and elderly persons. • Implementation of poverty-reduction programs. • Coordinate the preparation and implementation of the plan for preventing and fighting social evils and negative values.	• Plans, programs, and annual budgets for combating negative values and social evils
Bureau of Economics	• Prepare and implement programs for the development of the city's industrial sector, especially handicrafts. • Prepare and implement programs for the development of the agricultural sector. • Manage the city's irrigation system. • Plan new agricultural settlements. • Plan new residential areas in rural areas. • Develop/obtain and disseminate appropriate technologies for the development of the city's industrial and agricultural sectors.	• Agricultural land-use plan • Plans, programs, and annual budgets for industrial development • Plans, programs, and annual budgets for agricultural development • Irrigation system development and maintenance plans, programs, and annual budgets • Industrial technology sourcing and dissemination plans, programs, and annual budgets • Agricultural technology sourcing and dissemination plans, programs, and annual budgets
Bureau of Urban Management, Land Administration and Housing	• Investigate, assess, and classify lands for various uses; prepare land-use plans. • Enforce laws and regulations pertaining to land use. • Administer land transfer, land lease, and appropriation of land for development. • Settle land disputes. • Coordinate with the province on the formulation of Urban Master Plan. • Coordinate the implementation of the Urban Master Plan. • Formulate detailed urban plan. • Prepare and coordinate the implementation of environmental management program. • Supervise the Team of Urban Rule and Order Enforcement.	• Urban Master Plan • Detailed urban plans • Infrastructure master plans • Status of urban land use • Urban land use plan • Status of implementation of Urban Master Plan • Systematic compilation of records of land ownership • Land management plans, programs, and annual budgets • Environmental management plans, programs, and annual budgets
Team of Urban Rule and Order Enforcement	• Publicize and educate the public on laws and regulations on land-use, construction, environmental protection, housing development, and proper use of urban infrastructure.	• Public information campaigns on land-use, construction, environmental protection, housing development, and proper use of urban infrastructure

Name of Unit	Key Functions	Key Result Areas
	• Assist individual citizens as well as public and private entities in conforming to the aforementioned laws and regulations. • Detect and investigate any and all forms of violations of those laws and regulations. • Recommend sanctions, including the imposition and amount of penalty, on violators to the Chairman of the People's Committee of the city. • Recommend new regulations and/or revision to existing regulations to improve the performance of its functions. • Perform such other functions as may be entrusted by the People's Committee of the city.	• Inspection reports on land-use, construction, environmental protection, housing development, and proper use of urban infrastructure • Proposed resolution of violations of laws pertaining to land-use, construction, environmental protection, housing development, and proper use of urban infrastructure • Proposed revisions of existing regulations or new regulations on land-use, construction, environmental protection, housing development, and proper use of urban infrastructure
Investment Project Management Board	• Assist bureaus and other city government units in preparing investment proposals. • Conduct feasibility studies and detailed engineering design. • Administer the tendering of construction projects within the scope of authority of the city. • Recommend to the People's Committee the winning bidders. • Prepares construction contract documents for the signature/approval of the People's Committee. • In coordination with the concerned bureau, supervise project implementation/construction. • Verify and certify project progress monitoring and evaluation reports as basis for progress payment. • Verify and certify project completion reports. • Arrange for the hand over of completed investment projects.	• Guideline for preparing investment proposals • Feasibility studies • Detailed engineering design • Bid documents • Bid evaluation reports and recommendations for awarding of contracts • Certified true and correct project progress reports • Certified true and correct project completion reports
Urban Works Company	• Market the company's construction services. • Prepare detailed engineering designs for construction works for the government and the private sector. • Supervise and execute construction works of the government and the private sector. • Prepare and implement investment programs for the development of the city's solid waste management, wastewater management, drainage, street lighting, roads, and public parks. • Collect and transport solid waste. • Operate and maintain the city's solid waste final disposal site. • Maintain the city's drainage network. • Render desludging services. • Operate and maintain street lighting system. • Maintain the city's road network. • Maintain public parks.	• As built drawings/ledgers of public infrastructures for solid waste management, wastewater management, drainage, roads, street lighting, and public parks • Annual update of the foregoing records • Inventory of tools and equipment used in operation and maintenance of the foregoing infrastructures • Annual investment programs and budgets for the improvement or construction of new infrastructures • Public information plans, programs, and annual budgets • Accomplishment reports on the delivery of solid waste collection and transport and desludging services

Name of Unit	Key Functions	Key Result Areas
	• Procure, operate, and maintain tools and equipment needed to perform the organization's functions. • Promote sound health and sanitation practices. • Promote community participation in the delivery of public infrastructure services.	