AMQ International
Strategic Asset Management

Issue 23, November 19 1999

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Watermain Rehabilitation and Renewal Program—Canada

Aging Assets? Financial Constraints?

Then consider the successful two stage approach of the Region of Ottawa- Carleton.

- Stage 1: MACRO (Establishing the budget)
- Stage 2: MICRO (Prioritising/optimising)

The entry by Fattah Hashem-zadeh of the Engineering Division, Transport & Environment, Region of Ottawa-Carleton, contains elements that could be adapted by Asset Managers in any agency. So don't be put off by the fact that Fattah is talking about watermains – the principles and practices equally apply to schools, to roads, to anything.

The key elements are:

- Intelligent database construction
- Macro level planning – forecasting renewal
- Prioritising asset activities with screening, evaluation, and an established decision-making process
- Choosing the optimum technique – taking related assets into account

Winner of the

GHD
Assets & Facilities Management Group

Award for Asset Management Excellence

Intelligent database construction

The Central Water Supply System of the Region of Ottawa-Carleton serves over 11 local municipalities with a serviced population of over 680,000 via a watermain network of over 2,400 kilometres of pipes of various materials, ranging in age from just installed to over 125 years. In the late 1980s the Regional System experienced a sudden increase in watermain failure rate. This even raised concerns; at that time the Region had only limited knowledge about the physical integrity and hydraulic conditions of its system.

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Manual records only

Pipe characteristics and maintenance data were recorded manually with no mechanism to keep the system data up to date.

Databases projected to cost $1.8 m

A major study recommended databases should be constructed and contain geographical, geometric, physical characteristics, soil properties, and historical pipe break data, at a minimum projected cost of 1.8 million dollars.

In-house development

The Region at this time did not have provisions to spend this much to determine the recommended databases so the Engineering Division decided to develop them by making use of the internal staff part-time and hiring a university student to work full time on the project. In 1996 the Division completed its task of 5 major databases containing over 450,000 fields of data on pipe, node, pipe break, fire flow, and soil characteristics. Furthermore these databases have been integrated into a relational database management system and added to the Regional Geographical Information System.

Available General Database System

In 1997-98, the Region took advantage of the latest development in the field of infrastructure asset management as the American Waterworks Research Foundation (AWWARF) made the KANEW model available for all the North American member utilities.

Professional Calibration

The KANEW model is a user friendly computer software developed by Roy F Weston Inc of the USA and Dr Raimud Herz of Dresden University of Technology, Germany. It is used as a forecasting tool to assist water utilities in planning long term water network rehabilitation and replacement programs. In 1997, the Region retained Weston to calibrate the model for their conditions.

The advantage of the model was its ability to handle lage amounts of data, using Microsoft Access, no cost for the software (provided free by AWWARF), ability to forecast for any specific planning period, output provided in graphic as well as tabular form.

Modelling Process

The modelling process for using the KANEW is:

1. categorize watermains
2. develop watermain inventory
3. define watermain life expectancies
4. run the model
5. review the model output

Categorizing watemains

In categorizing the watermains, the following characteristics were used: pipe material, pipe diameter, lined versus unlined, soil classification. All of these are likely to impact the expected life of the pipe.

Life Expectancies

Life expectancies were defined on the basis of probabilities. In a typical model application, the user estimates the life span, in years, for pipes within each category that 100%, 50% and 10% of the pipes are expected to reach without rehabilitation or replacement, although minimal spot repairs may be necessary.

Runs of the model (optimistic, cautious, likely) are matched against recent break experience.

The models look at replacement over the next 50 years and establish the appropriate level of the annual budget for watermain rehabilitation.

SECOND STAGE MICRO PLANNING

Decisions are then made at the micro level:

- Which assets and
- Which techniques (eg cathodic protection, pipe cleaning and relining, or replacement)

To determine how best to spend the annual rehabilitation budget, a screening model was developed that rated all watermains and ranked them in descending order. (see table)

Micro Level Planning

The computer model described in the table below is used as a screening tool only, final rehabilitation decisions are made by the Committee formed to oversee the program after a thorough evaluation process on a case by case basis.

Watermain Rehabilitation & Renewal Program
Screening Criteria for Priority Setting (MicroLevel)
(for small diameter watermains – 400 mm andsmaller)

1	**Age of Pipe**	**Rating Points**
	Over 80 years	4
	51-80 years	3
	21-50 years	2
	0-20 years	1
2	**Diameter of Pipe**	
	Divergence from minimum (152mm)	
	Less than 152	2
3	**Depth of Pipe**	
	Divergence from standard (2.4m)	
	1.5-2.0 m	1
	less than 1.5m	2
4	**Service Connection**	
	Lead service	1
	Asbestos main	3
5	**History of Leaks/Breaks**	
	(1 to 5 year data only)	2 per break
	(6 to 10 year data only)	1 per break
6	**Hydrant Flow @ 20 PSI residual**	
	500-1000 US gallon/minute (USgpm)	
	less than 500 USgpm	3
		5
7	**Coordination with Road Work/ Sewer Installation**	
	Yes	5
8	**Type of Development/ Land Use**	
	Commercial/Industrial	1
	Residential High Density	2
	Total Rating	…..

Note: Rating is used for priority setting, as follows:
20 or more – immediate need
15-19 (needed within 2-5 years)
11-14 (needed within 6-10 years)
6-10 (no need)

Positive Results from Co-Ordination with Road and Sewer Works

"The Committee gives utmost attention to insure that the watermain projects are coordinated with road and sewer works.

This is important for two reasons: first it saves about 50% of the cost, second, installing watermains on roads that have just been overlaid or constructed causes serious public and business dissatisfaction."

Opportunities from integrated works program

"We have been experiencing positive results from the installation of cathodic protection on the metallic watermains, as it significantly contributes to contain watermain failure rates in the central system. The cost of installing cathodic protection is about 5% of installing new pipe and it adds approximately 20 years to the life expectancy of the watermains. Therefore, it is a cost-effective way to increase the useful life of the system.

Every year, the Committee reviews the scheduled road projects for the next 5 years, as these are available electronically from the GIS system. If the pipes on these roads are physically sound and hydraulic capacity is adequate then they will be selected for cathodic protection program in conjunction with the road works.

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UK Councils – A Survey of Property Asset Management and Performance Measurement

Winner of this year's

Southbank Systems' SBS UK Award

in the International Asset Management Competitions 1998-1999 is the Survey conducted by DTZ Pieda Consulting for the Department of Environment, Transport and Resources and submitted by David Purdey, DETR.

The project objectives were:

- To obtain information on the current forms and methods of asset management and performance indicators in local government;
- To develop recommendations for a central framework of universal and comparable measures of performance for capital allocation;
- To set the research in the context of the new 'single pot' for capital allocations and the best value regime;
- To highlight good practice in property asset management and present appropriate examples;
- To develop guidance for local authorities in property asset management

The report presents research findings relating to the first four objectives. The guidance takes the form of a separate document and covers the good practice examples in more detail.

Introduction

This summary discusses the findings of research on the current forms of asset management and performance measurement used in local government.

A postal questionnaire survey was sent to a random sample of English local authorities, selected from categories based on type, population and deprivation. 193 local authorities received a questionnaire and 163 (85%) replies were returned.

The questionnaire sought to gather information on asset management and property performance, in particular seeking to establish:

- The extent to which councils currently undertake asset management and planning at an authority-wide level;
- The range, depth and accessibility of information held by authorities of information held by authorities on their land and property assets;
- The extent to which authorities measure the performance of their property assets;
- How local authorities use or prioritise their capital expenditure.

Qualitative research was also carried out through a series of twenty five case studies, aimed at identifying best practice. This involved structured interviews with representatives from each of the case study authorities to discuss the five main areas identified: asset management; asset management planning; capital management; performance measurement; and data management. The survey findings are representative of English local government and the case study data provides in-depth information on specific issues in particular contexts.

What is asset management?

Asset management in the context of this project is the strategic management of land and building assets in terms of the portfolio as a whole. We have defined asset management as **'optimising the utilisation of assets in terms of service benefits and financial return.'**

There is a difference between this type of asset management and day-to-day property and project management, and property services. Asset management is concerned with the long term view of all the local authority's assets, including those held and used by individual service departments, as well as those held by a local authority but used by an external organization, such as a community organization or a tenant of an industrial unit.

Survey and Case Study Findings.

- **Extent of asset management**

The findings show that there is limited authority wide strategic asset management being undertaken in local government, with little consensus on the asset planning process and no consistent structure of an asset management plan across local authorities. However, there is a strong case for asset management to encourage efficient and effective use of property and to enable property asset performance to be measured and compared.

- **Allocation of Asset Management Responsibilities**

Our view, based on public and private sectors, is that best use of assets is achieved with co-ordinated asset management and clear identification of roles and responsibilities. The findings from the case study authorities identify the structure of an authority as a significant influencing factor on its approach to asset management, with strong departmentalism within an authority seen as one of the main barriers to achieving co-ordinated asset management. The findings also show that the most effective asset management occurs when asset management responsibilities explicitly rest with a separate strategic property unit reporting to a specific committee with corporate-wide terms of reference.

- **Variation between authorities**

There was no significant differences in the findings between one type of authority and another, with some authorities being more active than others irrespective of type.

- **Asset rents as an asset management tool**

From our investigations we found little evidence that asset rents were being used as a direct asset management tool. Where they were being used, there were a variety of practices in terms of budgeting and incentives.

- **Capital Projects**

There was evidence that capital planning is well managed in many authorities, although the achievement of planned changes to the portfolio less often evaluated, particularly in terms of meeting overall project and service objectives.

- **Performance Measurement**

The findings of both the survey and case studies indicate there is limited performance measurement being undertaken, limited target setting or comparison and few performance management systems in place. This is unsurprising at a time when little emphasis has been placed on performance measurement. However, this is an area being reviewed by a number of authorities in light of Best Value. Where performance measurement is being undertaken, the links between objectives and performance measurement often do not appear to be made, and most attention is being concentrated on cost-based measures with limited interest in effectiveness and process measures.

- **Data Management**

Both the survey and case study findings showed that property data systems have received little investment in the past, leading to fragmented inflexible property data, which does not readily allow the portfolio to be reviewed as a whole. This is currently being addressed by many authorities, but comprehensive and accurate data on an authority-wide basis will be a prerequisite for co-ordinated asset

management and performance measurement.

- **Standardised categorisation of property assets**

It was evident from the survey findings that there is no consistent approach to the categorisation of land and property assets across local authorities. The use of standard categories will be essential, in our view, if performance is to be measured consistently in local authorities and benchmarked between authorities. Investigations were undertaken, and case study authorities consulted, on a proposed set of categories. These consultations suggested that it would not be a significant task to re-categorise land and property assets into the five proposed categories.

Conclusions and Recommendations

- **Variety of current practices**

The embryonic state of strategic asset management in many local authorities, the variety of current practices and the significant changes which are taking place at present, not least related to the introduction of Best Value and the requirement for continuous improvement, are factors which impact asset management planning and its implementation.

- **Central government focus on asset management for local authorities**

Central government attaches a high level of importance to asset management in local authorities. The DETR's overall objective is to ensure that councils make the best possible use of their capital assets. In this context, capital covers both capital deployed in existing land and property as well as new capital introduced either to improve or adapt existing assets or to create new assets.

- **Both new and existing capital**

Therefore the Government does not seek to limit performance measurement as part of the proposals for 'Single Pot' capital allocations to the use of 'new' capital allocated to and expended by local authorities, but rather to ensure performance measurement encompasses the use of all capital deployed in land and buildings that local authorities own or occupy, including the use of 'existing' capital deployed.

- **Performance Indicator framework established**

A framework for developing performance indicators out of this basic objective has been established, covering a range of process, output and outcome indicators.

The expectation and weightings between these indicators will vary over time, with the emphasis likely to start on process indicators and move towards an increase in importance of outcome indicators over time.

We understand that the DETR plan to propose and consult on a range of property performance indicators under a separate cover, and that, in due course, councils will be required by the DETR to submit data on these indicators on an annual basis, to be used as part of the assessment for 'single pot' capital allocations.

- **Asset Management Plans**

One of the tools used to ensure effective use of all capital deployed in land and buildings that local authorities own or occupy, including the use of 'existing' capital deployed, is an asset management plan.

Asset Management Plans should be central documents co-ordinating all activity on assets, drawing on other related documents such as service plans, DfEE's Asset Management Plans, HRA Business Plans, Local Transport Plans, community health plans and Best Value Performance Plans.

We recommend that asset management planning should be viewed as an ongoing programme of improvement rather than a one-off exercise.

- **Consistent AMP layout recommended**

To enable comparison by the DETR and to ensure better asset planning and management in local authorities, we recommend that a consistent layout for an Asset Management Plan should be introduced for all local authorities covering the following:

- ❑ Overview of property aims, objectives and strategies – the overall capital strategy;
- ❑ Statement of current portfolio;
- ❑ Summary of key areas for change;
- ❑ Preferred options for key areas;
- ❑ Implementation programme.

- **With consistent AMP process**

We recommend that, whilst there is a need to establish a consistent asset management planning process in all authorities, the extent and content of each section will vary with the amount of property assets owned by each local authority. However, even an authority with a small portfolio will need to address all the relevant issues.

- **Asset Management Roles and Responsibilities to be established**

We recommend that councils put in place appropriate management arrangements to ensure roles and responsibilities for asset management are clear and explicit. Wherever possible, we recommend strategic asset management should be separated from day-to-day property management. In smaller authorities, this separation may not be possible in terms of personnel resources, but there should be explicitly separate roles, albeit that they may be undertaken by the same person.

Whilst there are a number of benefits in extending the asset rent system, there are also arguments against it. We believe the introduction of other asset management tools such as Asset Management Plans and Performance Measurement Systems are of greater importance at this stage, and that the extension of the system of asset rents and related incentives should remain a matter for individual authorities to decide upon.

To assist local authorities to perform well, we recommend **Good Practice Guidelines** produced for local authorities should cover:

- ❑ Asset management planning;
- ❑ Capital projects;
- ❑ Performance measurement;
- ❑ Data management.

The profile of asset management needs to be raised and local authorities encouraged to use Asset Management Plans as a business tool integrated with other business and management processes. Therefore, we recommend an awareness programme is rolled out by the DETR on the following areas:

- ❑ Asset management and Asset Management Plans;
- ❑ The performance measures that will influence capital allocations;
- ❑ The Best Practice Guidelines on Local Authority Asset Management.

To enable comparison, we recommend that the following categories are adopted by the DETR and local authorities in future and that all land and property owned or occupied by each local authority should be categorised under these headings:

- ❑ Operational direct service property;
- ❑ Operational indirect service property;
- ❑ Operational office and administrative property;
- ❑ Non-operational investment;
- ❑ Non-operational surplus/vacant.

Further Information

'Measuring Performance in the Management of Local Authority Property' by DTZ Pieda Consulting priced at £29, is available from:

Department of the Environment,
Transport and the Regions
Publications Sales Centre
Unit 21, Goldthorpe Industrial Estate
Goldthorpe, Rotherham S63 9BL

Tel: 01709 891318 Fax: 01709 881673

Year 2000
International Asset Management Competitions

Designed to
- **recognise and reward excellence and**
- **promote the development of asset management across the world**

There are 6 entry categories as follows: More than one award may be made in any category. The Selection Panel reserves the right to make no award in a particular category. Entries should be received by no later than the **30th July 2000**.

1. **SOUND APPLICATION OF ASSET MANAGEMENT**
2. **MOST INNOVATIVE APPLICATION OF ASSET MANAGEMENT**
3. **BEST RESEARCH IDEA**
4. **BEST REVIEW ARTICLE**
5. **BEST CONSULTANCY PROJECT**
6. **BEST NEW PRODUCT/SERVICE**

1. SOUND APPLICATION OF ASSET MANAGEMENT

Eligibility This is open to any well-documented application of asset management that can demonstrate that it has resulted in a net (after cost of exercise) reduced cost and/or increased service delivery benefit.

Objective: **To increase the pool of 'good practice' exemplars available to asset managers**

Designed for: Asset Managers; and Consultants (but in conjunction with their clients).

2. MOST INNOVATIVE APPLICATION OF ASSET MANAGEMENT

Eligibility: This is open to any well-documented new idea or application that has potential to result in a net (after cost of exercise) reduced cost and/or increased service delivery benefit.

Objective: **To encourage innovation**

Designed for: Asset Managers; and Consultants (but in conjunction with their clients).

3. BEST RESEARCH IDEA

Eligibility: This is open to any well-reasoned idea demonstrating potential for service delivery improvement and/or cost reduction in the management of assets. This includes the development of new procedures, tools, methodologies, and new applications of existing technologies.

Objective: **To encourage research and development with a focus on practical application**

Designed for: Students, researchers, and anybody with ideas!

4. BEST REVIEW ARTICLE

Eligibility: This is open to any review that looks at the historical development and/or current state of play of any asset management related issue. Critical reviews that analyse, as well as describe, are particularly favoured.

Objective: **To enhance the body of general knowledge available to asset managers**

Designed for: Students, researchers, consultants (in conjunction with their clients)

5. BEST CONSULTANCY PROJECT

Eligibility: This is open to any consultancy project report that demonstrates the best of professional initiative, rigour and presentation.

Objective: **To encourage and recognise good professional practice**

Designed for: Consultants. (Awards will be made to both Consultant and Client Company in recognition of the key role that the client plays in designing the brief and managing the project.)

6. BEST NEW PRODUCT/SERVICE

Eligibility: This is open to any new product or service (substantially designed or upgraded within the last 3 years) that enhances the operations of asset managers.

Objective: **To encourage the development of tools and services for asset managers**

Designed for: Suppliers to the asset management industry

Further details: www.amqi.com