



# **assetic system overview**

Asset Management for LG, NFP, Ports and Utilities

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# SECTION 1

## Asset Management Frameworks

### 1.1 What is Asset Management?

**Definition:**

Asset Management in essence is “the planned alignment of physical assets with service demands”. Service Delivery underpins the essence of providing and maintaining assets. Assets are a means to achieve an end, i.e. not an end to themselves. There are numerous definitions for Asset Management which may be accessed from the websites of various State based Local Government Associations. In general terms, from a Local Government perspective, all these definitions lead to the same conclusion: Asset Management is a structured decision making framework, using available data and information, to achieve desired services at the least cost.

**Principles of Asset Management:**

The principles of Strategic Asset Management include those listed below.

- Assets exist only to support the delivery of services.
- Asset planning is a key corporate activity that must be undertaken along with planning for human resources, information and finances.
- Non-assets solutions full life-cycle costs, risks and existing alternatives must be considered before investing in built assets.
- Responsibility for assets should reside with the agencies that control them.
- The full cost of providing, operating and maintaining assets should be reflected in agency budgets.
- The rates of consumption of service levels (asset potential) must form the basis of calculating depreciations.

Asset management is an evolving discipline that combines the essences of engineering, economics, social sciences and accounting. In more recent times it is increasingly being adopted by organisations for the management of all major infrastructure including but not limited to, roads, drainage, water, sewerage, buildings, parks, open spaces, footpaths, ports and properties.

It is therefore critical that Asset Management Practitioners develop a service level focus for asset management delivery. Assets are a means to an end, the end being service desired by the community. Assets should not exist for the sake of having assets, rather they should exist to provide services. The level at which services are provided should determine what types of assets are required, where they should be located, what their minimum condition and functional characteristics ought to be.

## Asset Management Frameworks continued...

### 1.2 Elements of Good Practice Asset Management

An organisation that is living and breathing good practice asset management is able to:

1. Clearly articulate its current position in relation to asset stock.
2. Clearly articulate the relationship between level of service and asset stock.
3. Clearly quantify the current standard of the asset – condition, functionality and safety.
4. Clearly quantify the cost of service delivery at present and in the future (20 years plus).
5. Clearly identify for its stakeholders where resource and financial gaps exist in relation to funding infrastructure renewals and maintenance.
6. Clearly define how assets are consumed and reflect this consumption in its annual reports as depreciation (annualised costs of providing future services).
7. Accurately track maintenance and capital to provide representations of how the funding was spent.
8. Clearly produce for its stakeholder's performance reports that demonstrate how the asset portfolio condition and serviceability performed – return for investing in asset maintenance and renewal.

#### Asset Management Meeting – Balancing Budgets for Fiscal Year



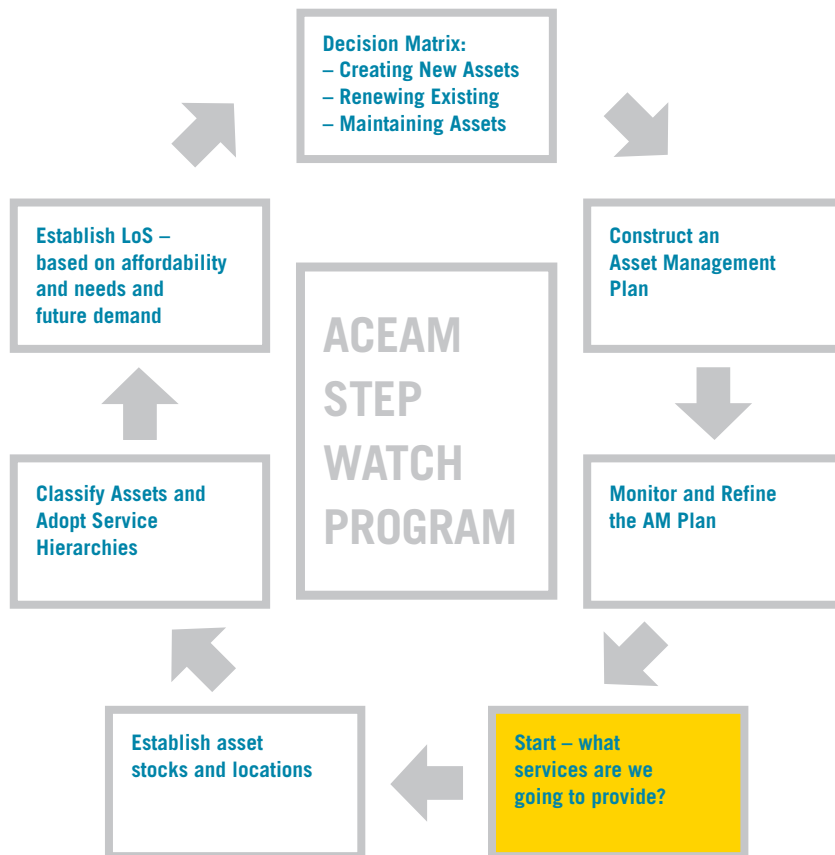
"Our figures are the same as last year's, except that there are minuses where the pluses used to be."

## Asset Management Frameworks continued...

### 1.3 STEP-WATCH Asset Management Planning

#### Journey

The implementation of Assetic Systems are based on the proven Service Centric STEP-WATCH model. The STEP-WATCH journey begins with development of corporate service levels. The adoption of corporate decision making criteria is the key ingredient of asset management decision making. Assetic systems which predict financial projections, predict future Capex projects and develop long-term planning scenarios are all based on corporate decision making frameworks. The implementation is organisation specific, stems from corporate level of service identity and therefore the financial and engineering plans are a robust outcome.



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1.4 The Systemic Framework of AM Development

**Life Cycle Plans**

**Twenty Year Financial Plans**  
Funding needs, best way to spend money, how much do we need and why, what will happen in five, ten, twenty years time...

**Annual Work Plans**  
Reseal prog, rehab prog, pipe upgrades, building repairs, parks upgrades, 3 year programs in advance.

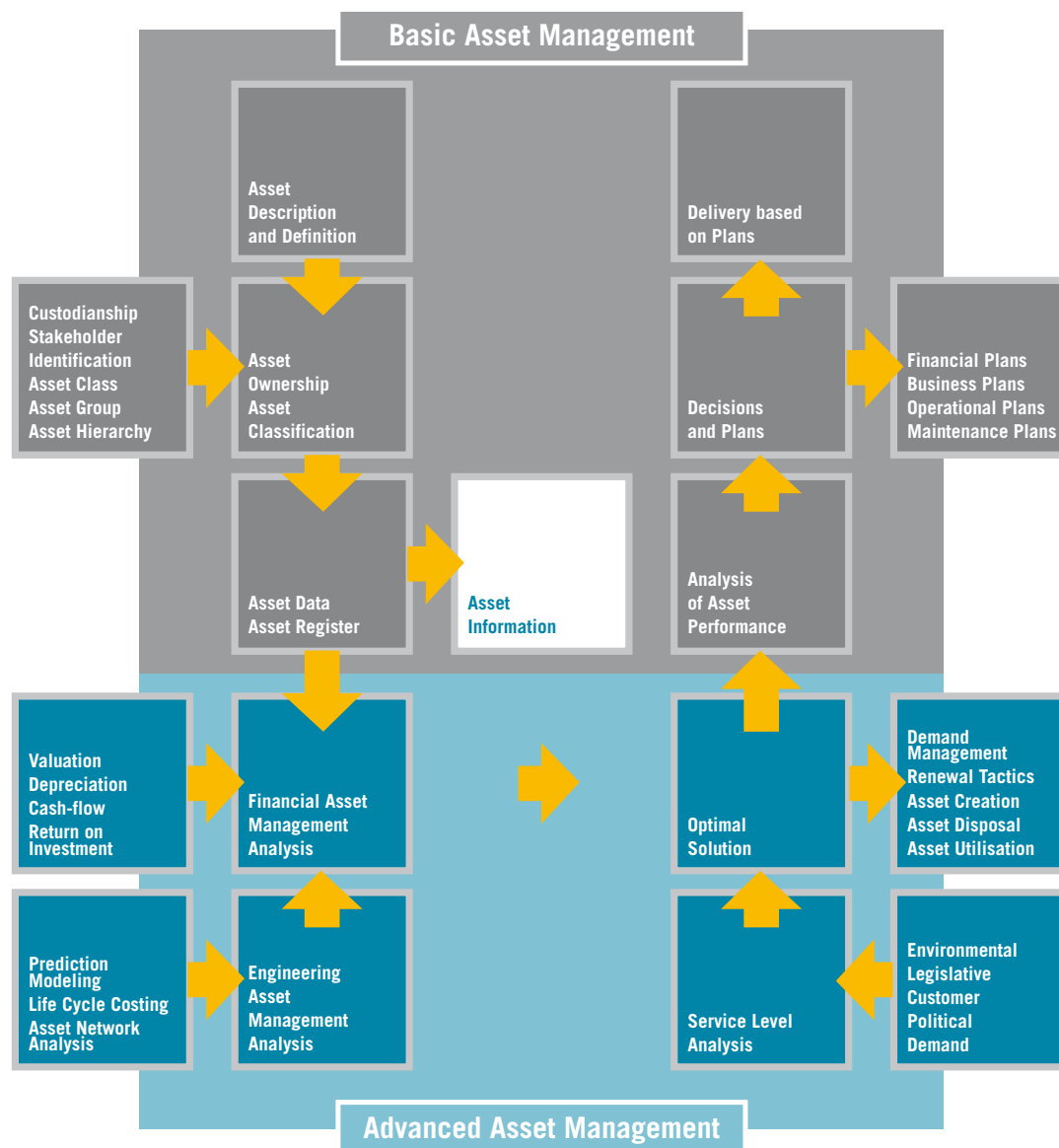
**Day to Day Maintenance**  
Work orders, customer requests, work close off, pinkys...

**Asset Accounting and Valuations**

**Asset Data - Central Repository Inventory, Condition, Capacity, Functionality Data**

# Asset Management Frameworks continued...

## 1.5 The Asset Management Planning Journey



Based on International Infrastructure Management Manual

# SECTION 2

## Asset Inventory and Asset Attributes

### 2.1 Inventory Management

**Definition:**

Asset inventurisation is the process of recording and accessing asset information to measure and report on the performance of assets in the delivery of services. The asset database provides information for strategic planning and operations management by asset custodians. Information categories include:

- Physical details (e.g. location, condition, dimensions)
- Management of Priority – Asset Hierarchies
- Operational Breakdowns – Asset Classification
- Financial details (e.g. service potential, risks and liabilities)
- Asset performance details – returns on renewal and maintenance spending
- Service performance indicators –

**Objective:**

The objective of the asset inventurisation process is to facilitate ready access to relevant information so as to answer questions such as:

- What assets are in the agency's custody?
- Where are the assets located and what are their dimensions, material and brand?
- What is their condition, capacity and functional characteristic?
- What is the appropriate maintenance strategy based on risk analysis?
- How do these assets contribute to the agency's mission, or what is the correlation between assets and services?
- What is the service potential of these assets?
- What are the past transactions and events associated with the control of the assets?
- What are the future benefits and risks associated with the assets?
- How are assets performing compared with set service delivery indicators?

Asset inventory and attributes are the fundamental sets of data that will allow organisations to account for their assets and plan for their systematic maintenance and replacement. After all, knowledge of what assets we own and where they are located is fundamental to our ability to manage them in future and determine the costs of maintenance and renewal. When the Accounting Standards were released in Australia, the first job on hand for Government Agencies, Ports and Defence was to collect and collate

## Asset Inventory and Asset Attributes cont...

meaningful inventory. The recently introduced DVC surveys in Victoria, Grants commission requirements, Local Government Inquiries in NSW and SA, STEP programs in Queensland and Tasmania, various state legislations and the annual local government financial audits are all probing into accurate asset stock information:

1. How much stock do we have?
2. Where is it located?
3. What size, dimensions – width, length, volume, capacity, area is the stock?
4. What types of hierarchies can we categorise the asset stock into?
5. Are there sub-asset types?
6. How do we identify asset location – GIS, GPS, local descriptions based on offsets.
7. Are different assets servicing differing needs
  - a. Load limits or special mass limits on roads.
  - b. Useage criteria with halls, buildings and libraries.
  - c. Passive recreational facilities within an active recreation reserve.
  - d. Pipe capacities to cater for a growing locality or suburb.
8. Are some assets able to be disposed?
9. Is there a legislative standard applying to the asset?
10. Is the asset shared with neighbouring Councils or entities?
11. Are any assets impaired?
12. When was it built, commissioned or made public?
13. What is its maintenance and capital history?
14. What level of public useage occurs on the asset?
15. Special coding e.g Road of Regional Significance, Heritage Building or Migrant Resource Hall.

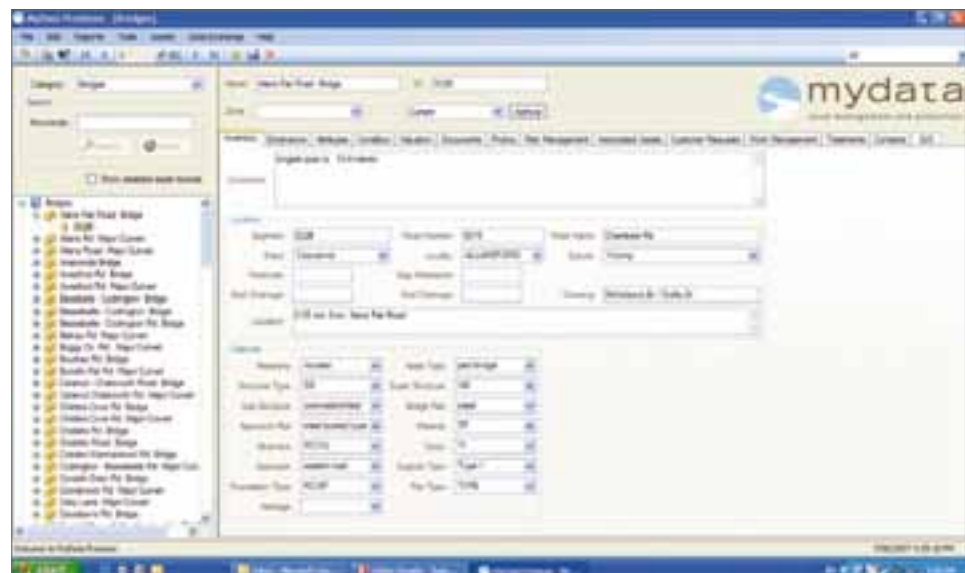
The task of collecting and recording inventory is by no means a small task, but at the same time it is not a complex task. Most attributes for local government are well defined and accepted. There are accepted manuals and guidelines for data collection in various states e.g Austroads and ROCOND for roads, The Queensland Roads Manual, Building Code of Australia, International Infrastructure Manual, Water Industry Guidelines etc

## Asset Inventory and Asset Attributes cont...

### 2.2 Assetic System – Inventory Management

Assetic is setup for:

1. Recording inventory attributes specific to local government guidelines. Audit trails (processes & reporting).
2. Importing inventory data from Council's field PC-Tablets or hand-helds.
3. Customised reporting of asset inventory and stock for typical local government reporting:
  - a. Grants Commission reports.
  - b. NSW reporting guidelines, TAM plans in NSW and Tasmania, SA Asset Management Templates.
  - c. STEP plans in Vic, Queensland, WA and SA.
  - d. Australian Accounting Standards and the new IFRS.



Asset inventory/condition

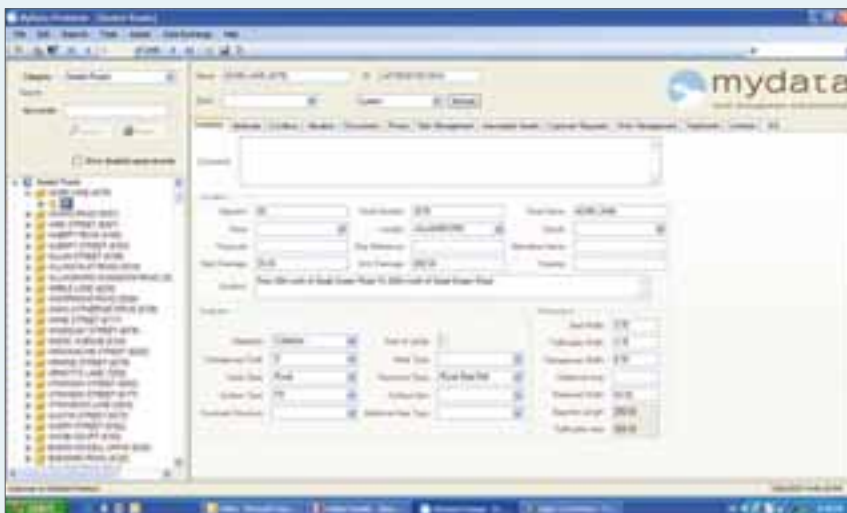
## Asset Inventory and Asset Attributes cont...



User defined navigation for asset identification



Sewer inventory

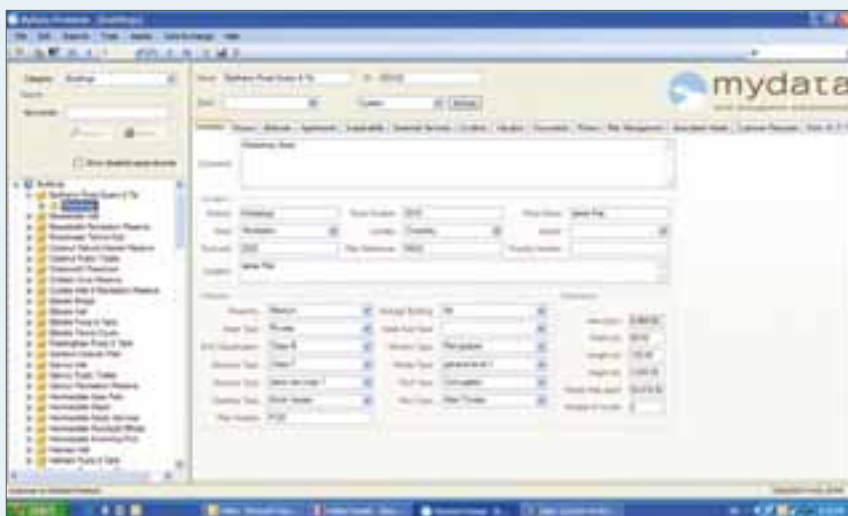


Roads inventory

## Asset Inventory and Asset Attributes cont...



Location of assets



Building inventory

# SECTION 3

## Asset Condition, Functionality and Capacity

### 3.1 Asset Standards – condition, functionality, safety

#### Definitions:

The best definition of asset standards is *'an acceptable level of asset condition, functional characteristics and safety features that will provide a satisfactory service in line with community expectations and affordability'*.

The fundamental requirement is to use a systematic method designed to produce consistent, relevant and useful information. The objective of asset assessment is to provide sufficient information to allow informed strategic asset planning and management decisions to be made.

Assessment results, together with utilisation and cost considerations, can be used by agencies to support a wide range of asset decisions, particularly in relation to the following:

- Maintenance Management
- Maintenance strategic planning
- Asset review and analysis
- Disposal planning
- Life cycle planning

The condition assessment process for built assets should, as a minimum, rate asset condition, determine the risks associated with letting an asset remain in that condition, and identify maintenance work needed to store to and retain an asset in its required condition.

Condition has been the predominant data-set that many local governments have collected over the years. Asset condition has been used to determine work programs, capital upgrades, renewal programs and maintenance. However, asset functionality – i.e. the suitability and capacity of the asset to service a perceived need is also a very important aspect of asset standards. For example, a library might be in perfect physical condition but its ability to deliver an intended level of service may be compromised because it does not have enough seating capacity for the actual usage and it does not provide access to internet facilities or it does not have adequate parking facilities.

The important task for Local Government is to determine how to measure condition, functionality and safety in a manner that will be meaningful in articulating the following:

1. What is the present standard of our buildings, reserves, roads, footpaths, drains and sewerage.
2. What is an acceptable standard from the community perspective.
3. What proportion of our asset stock is below community expectations.
4. What proportion of our asset stock is due for renewal based on desired standards.
5. How did our asset stock perform in the last 3, 5, 10 years – what was the change in the standards in relation to our expenditure on maintenance and capital.

## Asset Condition, Functionality and Capacity cont...

Therefore in determining how to measure condition or functionality, the following items are analysed:

1. **Criteria** relevant to the asset:

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  - a. Visual characteristics like structural capacity (bridges), surface deficiencies (roads), ambience and layout (buildings), structural disjoints (pipes).
  - b. Touch, hearing and feel characteristics like temperature of valve or plant item in a waste water treatment plant, irregular sound patterns in a mixer pipe.

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2. **Severity** of criteria:

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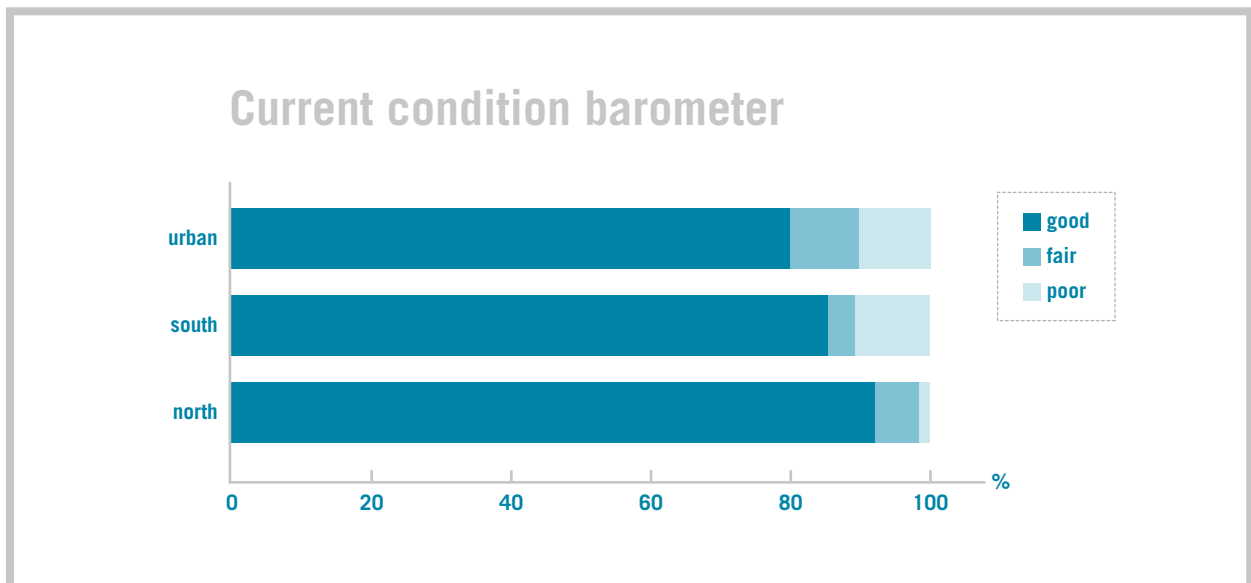
  - a. Depth of a pavement depression, width of a structural beam crack, depth of softfall, size of a fatigue crack on a reservoir wall.
  - b. Lack of ambience or space in buildings specific to a functional use.

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3. **Extent** of condition:

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  - a. Is the measured criteria affecting a small component of the overall asset or a predominant component of the overall asset.

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Graph shows the current standard of Council's total infrastructure asset stock. The standard has been represented by % of the stock in good, fair and poor state for condition, functionality and safety aspects of the asset.

## Asset Condition, Functionality and Capacity cont...

Shown below is a sample condition measurement matrix for visually assessing structural fatigue cracking in a concrete beam.

Sample condition matrix table			
0			
S1	S2	S3	<b>0 = no cracking</b> <b>S = slight severity &lt;1mm wide</b> <b>M = moderate severity &lt;3mm wide</b> <b>X = extreme severity &gt;3mm wide</b>  <b>1 = less than half beam length affected</b> <b>2 = less than 75% beam length affected</b> <b>3 = &gt;75% beam length affected</b> <b>X3 = unsafe – repair immediately</b>
M1	M2	M3	
X1	X2	X3	

An example of a 1-5 rating scale is shown below:

Roads Condition Rating	Rating
No observation of cracking, shape-loss, deformations	0 (excellent)
Defects affecting up to 5% of segment area	1
Defects affecting 5 – 20% of segment area	2
Defects affecting 20 – 50% of segment area	3
Defects affecting 50 – 80% of segment area	4
Defects affecting >80% of segment area	5 (worst)

Pipes Condition Rating	Rating
No blockage, age <50 years	1 (excellent)
No blockage ever, good soil conditions and age >50 years	2
1 blockage in 12 months	3
2 – 5 blockages in 2 years	4
Over 5 blockages in 2 years	5 (worst)



Footpath trip – >35mm step  
– safety deficiency



Disjuncted curb – >40mm  
– functional deficiency



Road edge defect – condition deficiency



Water pipe cracked – serviceability  
issue and road damage

## Asset Condition, Functionality and Capacity cont...

Most attributes for condition, functionality and safety with local government assets are well defined and accepted. Guidance is provided by the following manuals:

1. Building Code of Australia, includes essential services assessments.
2. Austroads/NAASRA – Guide to visual assessment of roads, used in all states.
3. ROCOND90 and URCOND 90 – used in most states and most predominantly in NSW.
4. Queensland Road Assessment Manual – used in Queensland, based on ROCOND.
5. WASA guidelines in assessing water and sewerage asset condition.
6. CSIRO guidelines on drainage, water and sewerage condition.



Water pipe cracked – serviceability issue and road damage



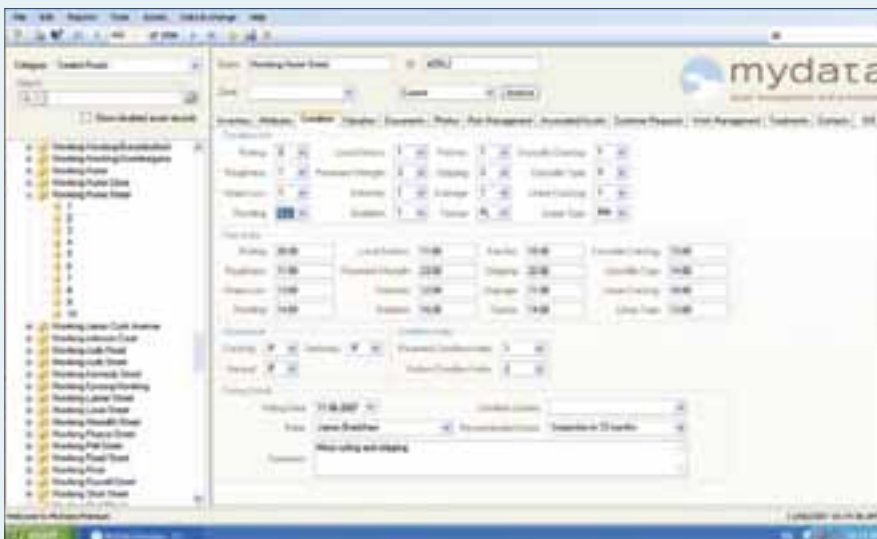
Toilet facility – aesthetic and cleanliness deficiency



Utility pit on Council asset – safety issue



Graffiti – aesthetic and cleanliness deficiency

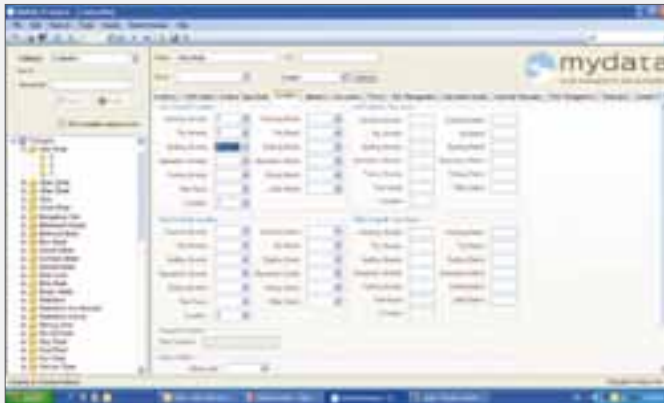


Roads condition screen

## Asset Condition, Functionality and Capacity cont...

Assetic's myData is setup for:

4. Recording condition attributes specific to local government guidelines.
5. Importing condition scores from Council's field PC-Tablets or hand-helds.
6. Customised reporting of asset condition, functionality and safety and stock for typical local government reporting:
  - a. Grants Commission reports.
  - b. NSW annual reports.
  - c. TAM plans in NSW and Tasmania.
  - d. STEP plans in Vic, Queensland, WA and SA.
  - e. Australian Accounting Standards and the new IFRS.

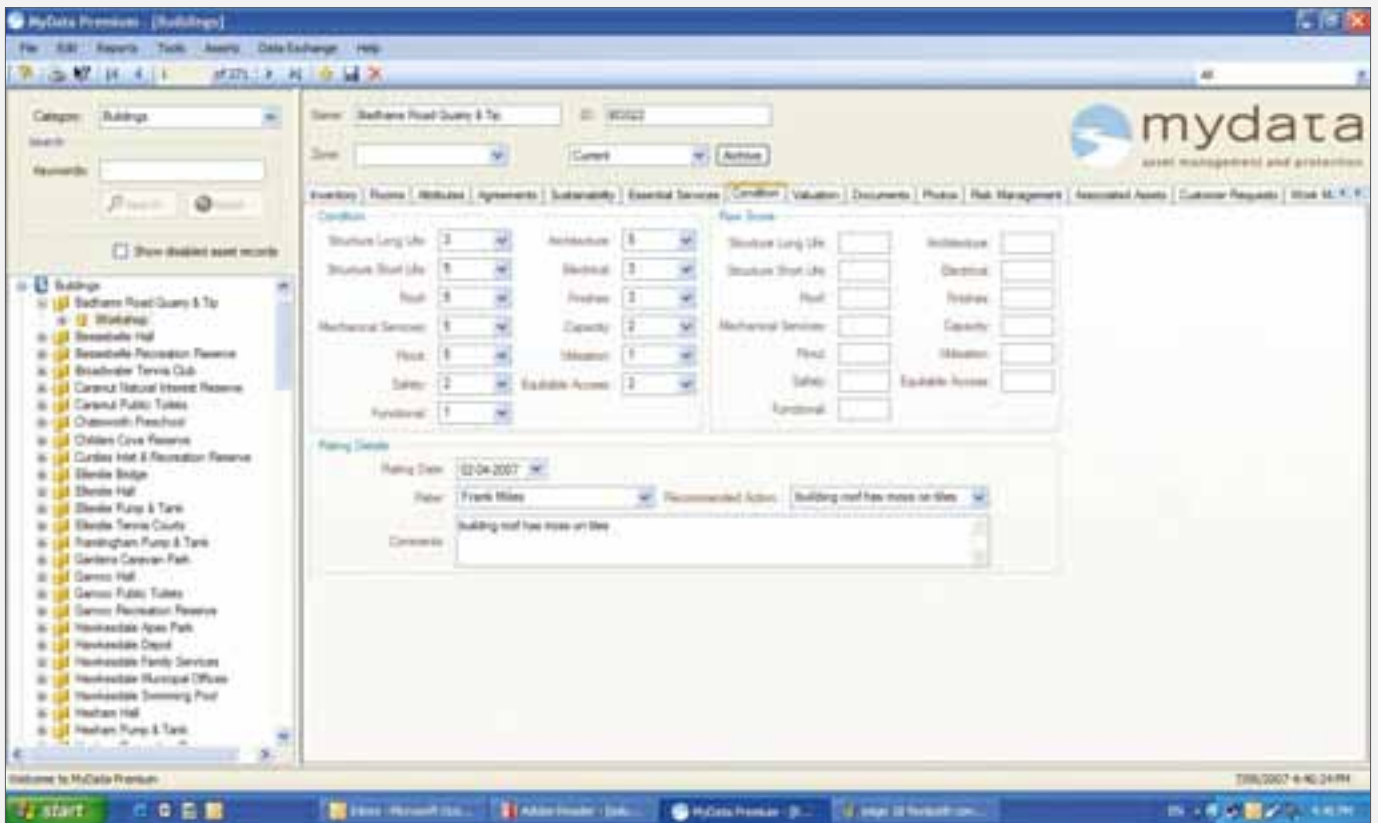


Footpaths condition screen



Condition of assets screen

## Asset Condition, Functionality and Capacity cont...



Buildings condition screen

# SECTION 4

## Asset Accounting



### 4.1 Asset Accounting Principles

The Australian Accounting Standards define assets as ‘future economic benefits’ controlled by the entity as a result of past transactions or other past events. Infrastructure assets have no market value i.e. a market price does not always exist. Therefore under accounting guidelines, an infrastructure asset is valued on the basis of its ‘replacement cost of the asset’s future economic benefits’, commonly known as fair value. This is shown in the following diagram from GAMS.

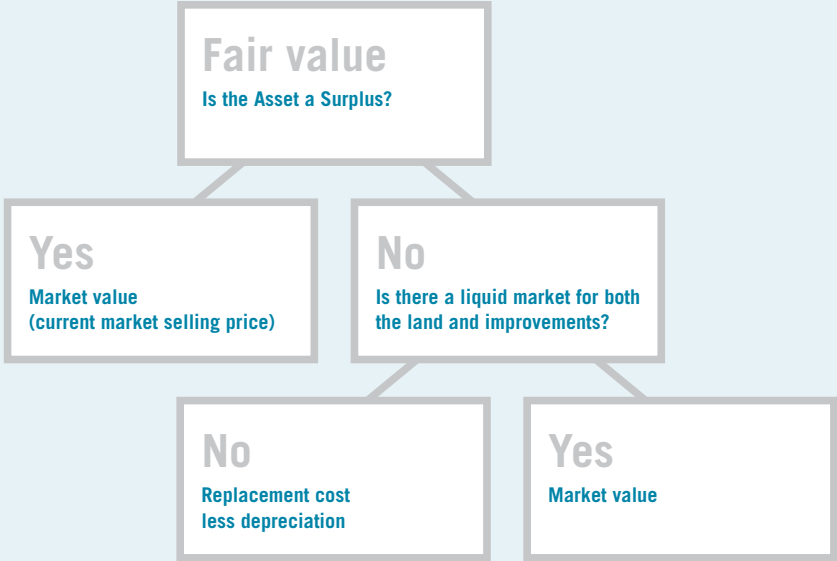
### 4.2 Why account for assets

Long life infrastructure like roads, footpaths, properties, buildings, sport reserves, water treatment plants, sewerage systems and water reticulation systems are vital to the future of our communities. It is now a recognised fact that simply providing the infrastructure in the first place is not enough. We need to be mindful of the future upgrades, renewals and regular maintenance, so that the infrastructure can continue to provide services over the next 50-100 years.

Accrual accounting has been used as a mechanism in Australia to determine the financial sustainability of an organisation to service the infrastructure in the future. In simple terms, we are required to account for our asset stocks, determine the current level of consumption of the stock and allow for a figure called **depreciation** in our annual financial reporting. It is allocated as an expense in the operating statement and has often been interpreted in part to determine the organisation’s financial viability. In basic terms, depreciation represents the consumption of the asset’s service potential.

AASB 116 clearly states that “The depreciation method used shall reflect the pattern in which the asset’s future economic benefits are expected to be consumed by the entity.”

GAMS and State Valuation Services flow chart



Source – GAMS and State Valuation Services



### 4.3 Methodologies

The new AAS116 in essence mandates that depreciation must match the real pattern of asset consumption. Predictive modeling is the only method available to simulate asset consumption patterns and develop depreciation profiles in line with accounting requirements, i.e. the asset accounting outcomes (depreciation) must be the result of **actual asset management practice**.

A methodology of asset accounting that simply determines depreciation as replacement value divided by a hypothetical useful life is not a valid method as it lacks justification of the most critical assumption which is 'the assumption regarding the pattern of consumption'.

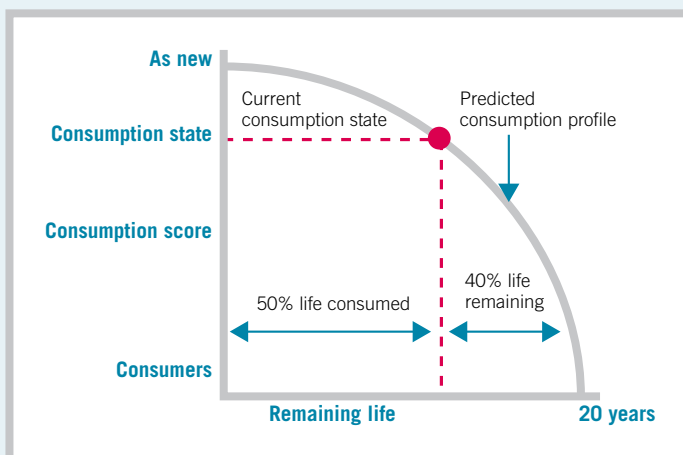
The rate at which an asset depreciates is therefore a function of where it is in its life cycle. This is shown below:

The most recommended methods of determining consumption are:

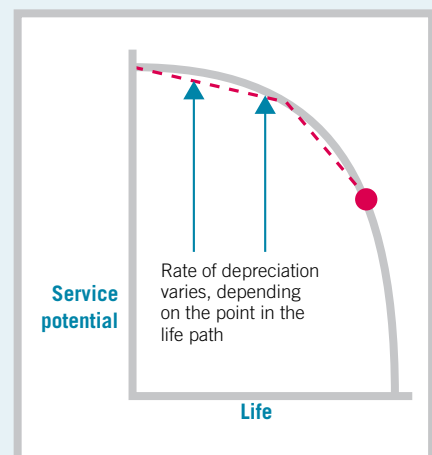
1. Real consumption based method.
2. Age based Straight-line method.

Straight line methods are generally based on age, where the current written down value is determined by the proportion of the age v/s total useful life. The biggest argument against straight-line age based depreciation methods is that it assumes that new assets will have higher values than old assets, which may not always be the case with infrastructure assets. Also, a straight-line pattern of depreciation may not be considered valid for infrastructure assets.

Consumption based depreciation assumes that condition, capacity and asset functionality data relates closely to the consumption or 'used up' proportion of the asset. Therefore it is possible to allocate a higher consumption to a relatively new asset if an assessment reveals that the asset has worn out due to higher wear/tear, in efficient maintenance or obsolescence in accordance with the standards.



Consumption graph



Condition graph

<b>Remaining Life Profile – Concrete Sewer Stock</b>			
<b>Consumption State</b>	<b>Remaining Life (Yrs)</b>	<b>Expended Life (Yrs)</b>	<b>% Consumed</b>
1	50	0	0-10%
2	45	5	10-20%
3	35	15	20-35%
4	25	25	35-70%
5	10	50	> 70%

The Department of Victorian Communities released a project paper in 2006 which clarifies the issues surrounding 'accurate depreciation reporting'. The NSW Local Government enquiry also revealed that depreciation which is not based on 'fair-value' may be at-least 30% off the mark in most cases. Most audit offices are in agreement with the principles of condition based depreciation.

It is critical to note that from an Asset Management perspective, depreciation is a very important figure. It is an accountant's measure of the annualised capital cost of the service. It is an internationally recognised method to measure the cost of 'use-up or consumption' of the asset's service potential. It is added to the annual balance sheet along with operational costs, insurances, running costs and maintenance to determine Council's financial position. Better asset management practice will mean better quality assets, which in turn should reflect as lower rates of consumption in the organisational financial statements. Similarly poor asset management practice will mean poor quality assets, which in turn should reflect as higher rates of consumption in the organisational financial statements. Therefore a shift in written down values between reporting periods must have a valid pattern of consumption based on an asset management prediction model.

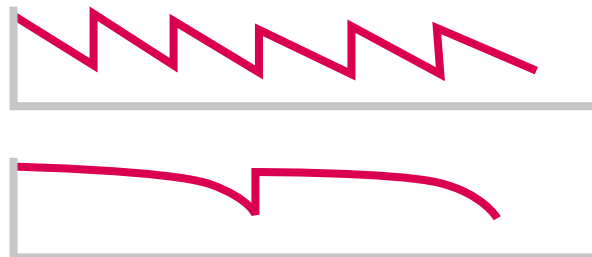
The Audit offices in various states are taking a more stringent approach to asset accounting. Queensland has taken a leadership role and presented cases of 'audit qualification' if Council's asset accounting practices are flawed. The audit office in its recent 2007 report tabled to the parliament has called for:

1. more accurate asset registers.
2. defensible consumption models.
3. more relevant justification for critical assumptions of useful life, remaining life and rate of renewal.
4. central or corporate asset accounting systems that are regularly updated for asset stock.
5. robust asset management frameworks.

### 4.4 Componentisation of Assets

Australian Accounting Standard (AAS16) requires that components of an asset that behave differently or have different replaceable patterns must be treated separately. This means that identification of components is based on:

1. Differences in useful lives - e.g a roof may last only 20 years whilst a building structure may last 100 years.
2. Differences in patterns of renewal – road surface may be replaced due to bitumen damage every 10 years but the under-lying pavement may only be renewed every 60 years.



3. Different rates of consumption.

For sample asset componentisation refer to the Queensland Audit Office website of DVC releases in Victoria on Asset Accounting Guidelines.



# SECTION 5

## Work Management and Maintenance Tracking

### 5.1 Works and Maintenance Management

**Definition:**

Maintenance Strategic Planning is the process that provides a strategic link between an agency's maintenance program and its corporate directions and core business. Maintenance strategic planning allows an agency to plan and implement a maintenance program in alignment with its capital investment, operational and disposal plans.

The process of maintaining physical assets covers all actions necessary for:

- Retaining an asset in a specified condition
- Restoring an asset to a specified condition

It requires a properly structured and professionally managed system to achieve this in a cost-effective manner. Maintenance excludes general cleaning and refurbishment to a new standard of use.

**Objectives:**

The objective of Maintenance Strategic Planning is to ensure that assets continue to support the business objectives and service delivery requirements of the agency. Maintenance itself also ensures that the capital investment in the asset is preserved, consistent with its age and market value.

The purpose of planning is to ensure that short and long term objectives are achieved in an efficient and effective manner. Planning should occur at the strategic level, as well as at the delivery level, to ensure that maintenance supports the agency's corporate and business directions, and that it links directly with programs for capital investment, management-in-use and asset disposal.

**Scope:**

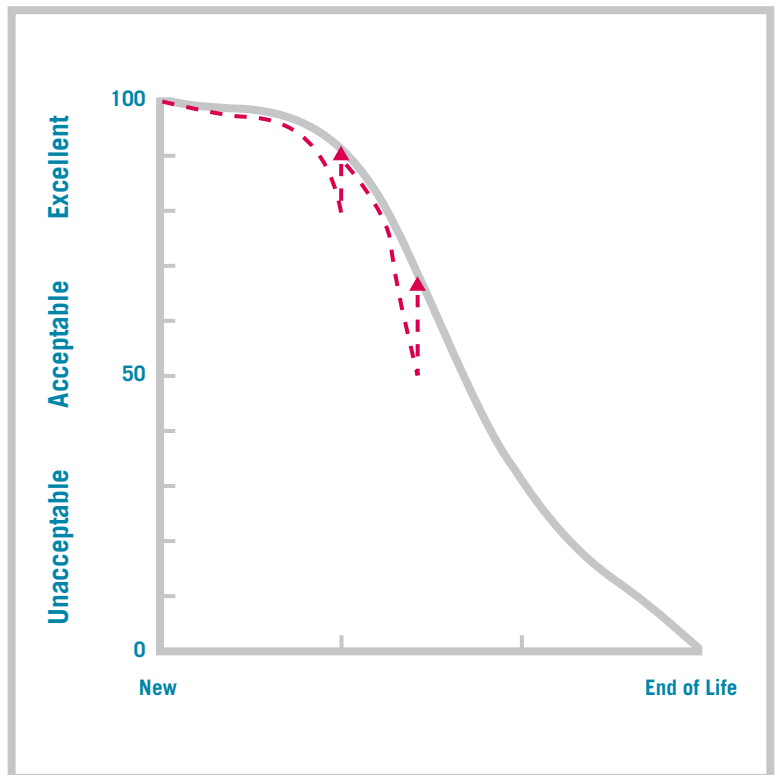
This guideline deals with maintenance planning and management considerations as they apply to non-current physical assets. Non-current physical assets are defined in the Queensland Treasury document Recording and Valuation of Non-current Physical Assets in the Queensland Public Sector as those tangible assets administered or controlled by a public sector agency having a life exceeding 12 months. The term includes assets normally classified as real property, plant and equipment.

## Work Management and Maintenance Tracking cont...

It provides guidance for those accountable officers for the development and implementation of strategic maintenance plans, and is intended to be used in conjunction with other guidelines in relation to Physical Asset Strategic Planning. As soon as an asset is placed into service, the maintenance of the asset commences. The key reason for doing maintenance is to keep the asset on its planned life path. Lack of maintenance or delayed maintenance most certainly leads to early asset failure and loss of service potential.

### 5.2 Key Elements of Good-Practice Maintenance

1. Optimal intervention – must intervene at the right time. Delayed reaction may mean the asset will deteriorate into a worse position and cost more to return to its life path.
2. Knowledge of condition – at what level of defect do we intervene and repair (intervention level).
3. Knowledge of risk – at what level of risk or safety is it best to intervene to mitigate consequences and likelihood of damage.
4. Knowledge of 'maximum action time' – how long can we leave a defect unattended before it will start to grow from a minor symptom to a more major deficiency. Maximum Response Time.



Toilet facility – aesthetic and cleanliness deficiency

## Work Management and Maintenance Tracking cont...

### Service Maintenance Standards – Playground Equipment Maintenance

Sub-Activities	Intervention Level	Repair Activities	Response Times	
Litter Removal	Reported or noted on inspection	Remove litter objects	High profile	1 day
			Medium and Low	1 week
Softfall replacement	Noted on inspection non-compliance to Australian standards	Maintain soft-ball levels	All	As required < 6 months
Equipment repairs	Reported, noted on inspection non-compliance to standards	Repair damage / vandalism rectification	High	1 day
			Medium	1 week
			Low profile	< 6 months
Signage checks	Noted, if signs are missing or in poor repair condition	Inspect and verify weekly, replace or clean	All	Inspections conducted weekly

### Service Maintenance Standards – Maintain and Replace Guard Rails

Sub-Activities	Intervention Level	Repair Activities	Response/Action Time	
Install – Maintenance works	<25m within a segment missing or damaged	AST 101	Rural Sealed	30d
			Rural Unsealed	50d
			Urban	20d
Replace lot – Capital works	>25m within a segment missing or damaged	AST 102	Rural Sealed	30d
			Rural Unsealed	50d
			Urban	20d



Maintenance on playground?



Maintenance on playground?



Road guard rail – maintenance required?



Road guard rail – maintenance required?

## Work Management and Maintenance Tracking cont...

### 5.3 Maintenance Management – Key Tasks

**Inspect the asset** – assess asset faults, risks and defects in accordance with corporate rules and intervention standards.

**Record the problem** – risk levels, types of defects and nature of faults including location.

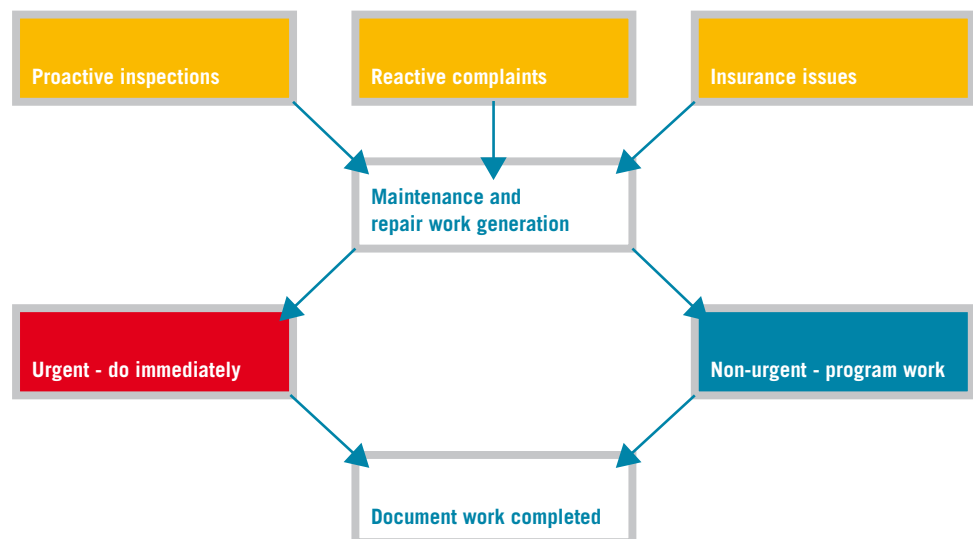
**Prioritise all outstanding work** – use time based and risk based prioritisation.

**Plan the work** – in accordance with resource availability and timing.

**Schedule the work** – using work orders with internal crew or external contractors.

**Track work** – using work orders and status of completion, response times and locations.

#### Traceability of Works, Events and Costs flow chart



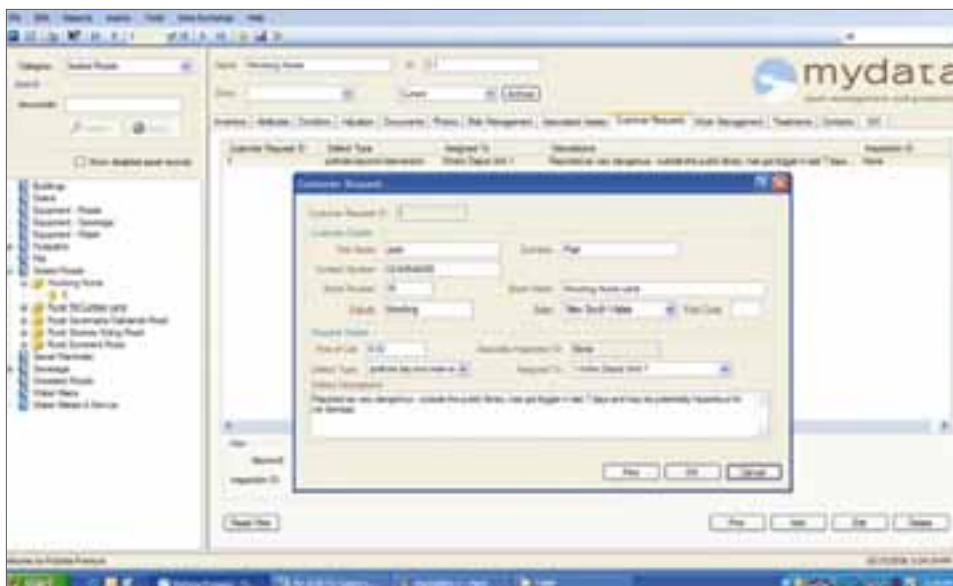
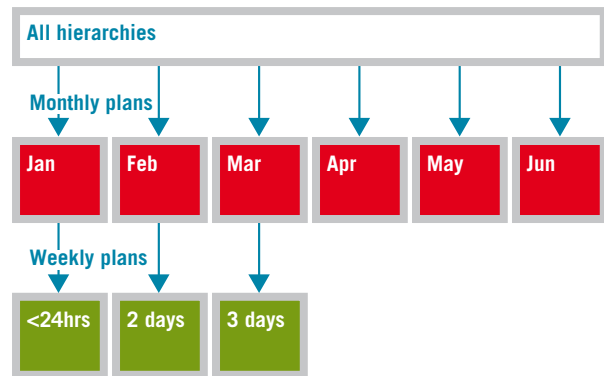
## Work Management and Maintenance Tracking cont...

### Work Planning

Assetic's myData is setup for:

1. Inspect assets in accordance with Council's Inspection Planning Regime
2. Plan work in accordance with Council standards and Asset Management Plans – service levels
3. Prioritise work in order of risk, safety and response times
4. Schedule works in accordance with available resources
5. Track works for monitoring maintenance performance
6. Report on work performance

### Work Planning flow chart



Customer Request to Track Reactive Responses

## Work Management and Maintenance Tracking cont...

**Inspect Now**

General Results

Defect Type

**Level 1**

- Air conditioning, heating and exhaust fans
- Any unauthorised work undertaken
- Doors, windows, lock, security screens and general security
- Exit, security and general lighting
- Fencing, gates and latches
- Fire extinguishers, hoses and hydrants
- Filing/Furniture
- Flooring

Item Detail

Defect Type: Flooring

Has Defect? [View Work Order](#)

Beyond Intervention?

Urgency: 5 Estimate Cost: 10,000.00

Location: Ground Floor

Comments: Water damage to ground floor carpets

Print OK Cancel

Inspect the Asset for defects and risks

**Work Order**

General

Work Order ID: 4 Status: Close

Inspector ID: 5 Purchase Order ID:

Intervention Standards

Defect: Flooring Hierarchy: High

Work Activity: Recarpeting Urgency: 5

Response Time: 15

Work Order

Due Date: 17-10-2006 Inspect Date: 18-10-2006

Schedule Date: 17-10-2006 Date Completed: 18-10-2006

Contract: Steve Chambers [Select](#)

Work Details: Replaced water damaged carpets

Costs

Contract Cost(\$): 5,250.00 Internal Cost(\$): 0.00

Quantity: 18 Cost Type: Carpet

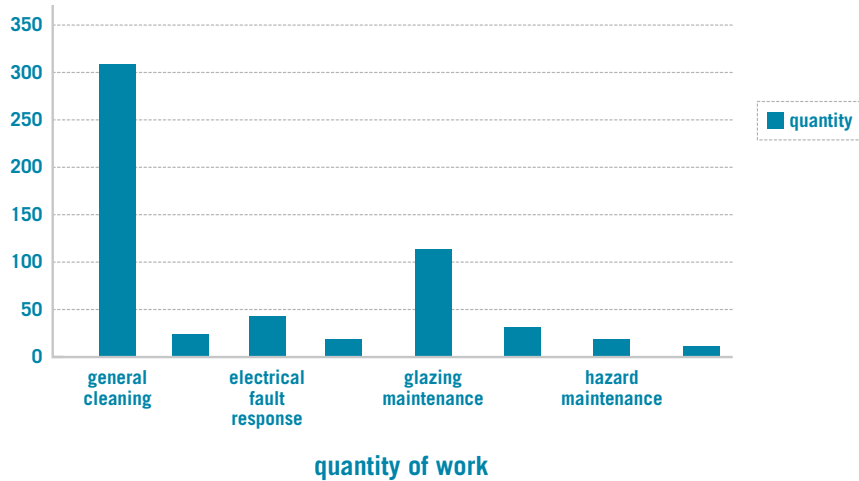
Edit Combinations Print OK Cancel

Work Order – Schedule work based on risk and response time

## Work Management and Maintenance Tracking cont...

### Work Quantity Incident Report

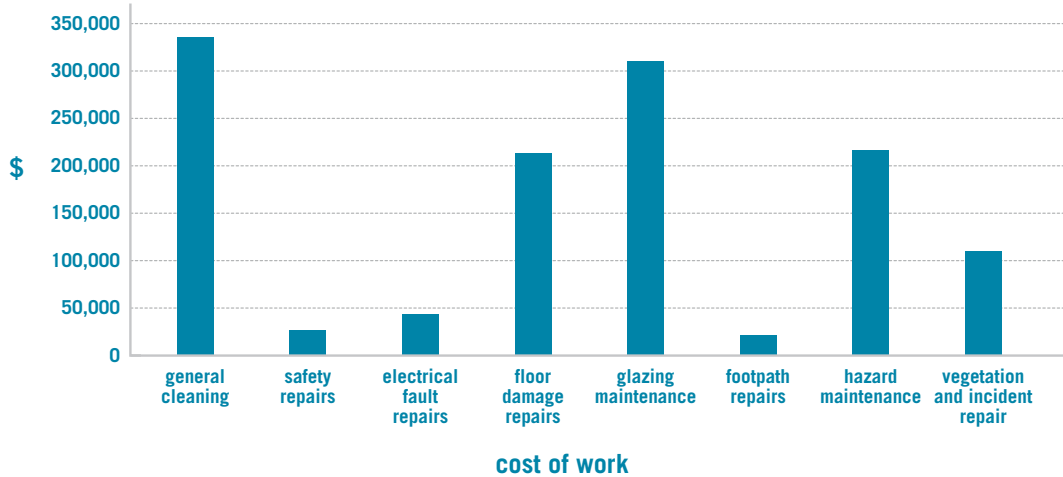
1 July 06 to 15 Sep 06



Incident Report – What activities did we spend our money on in last quarter

### Cost Report

1 July 06 to 15 Sep 06



Cost Report – Where did we spend our money in last quarter?

# SECTION 6 Risk Management



### 6.1 Risk Management Principles

**Definition:**

Risk Management is a systematic process to identify, analyse, assess and treat risks that may impact on an organisation's or an individual's objectives.

Risk is the possibility that an expected outcome will not be achieved, or be replaced by another, or that an unforeseen event may occur. This is a broad view of risk that includes both uncertainty due to future events and the consequences of limited knowledge, information or experience. Risk is measured in terms of consequences and likelihood under the Australian Risk Management Standard.

**Objectives:**

The objective of risk management is to:

- Systematically identify risks
- Determine the magnitude of these risks
- Develop ongoing measures to address them

Risk management should begin with service demand assessment and continue throughout the life cycle of the asset. Australian Standard AS/NZS 4360 defines the context of risk.

Risk is quantified on a two dimensional matrix – likelihood of an event and its associated consequence.

Most organisations will use a scoring system to quantify both strategic and operational level risks.

**Risk likelihood level table**

		Consequence			
		Low	Moderate	Major	Extreme
Likelihood	Certain	Mod	High	Extreme	Extreme
	Likely	Low	Mod	High	Extreme
	Possible	Low	Low	Mod	High
	Unlikely	Low	Low	Low	Mod



Risk severity and frequency table

		Frequency of Impacts (Probability)				
		Unlikely to occur	Hardly ever occurs	Occurs often	Likely to occur	Always occurs
Severity	Injury of minor value, may lead to a minor claim	1	3	6	10	15
	Injury of severity requiring medical attention, semi-major claim	2	5	8	14	19
	Injury of severity requiring professional medical attention, possible rehab and hospitalisation	4	8	13	18	22
	Injury of severity requiring professional medical attention, definate hospitalisation, rehab and possible loss of limbs	7	12	17	21	24
	Injury of severity that may result in disability, immanent hospitalisation, rehab and possible fatality	11	16	20	23	25

## Risk Management cont...



At an operational level, risk needs to be quantified at a localised platform – e.g. is an asset deficiency in a critical location within a low profile asset quantified as a higher risk than the same deficiency in a less critical location within a high importance asset. Recent insurance audits on local governments are seeking such frameworks in practice.



Risk of damage – edge drop off on a sharp bend – This is a higher risk when compared to a similar edge drop off on a straight wide pavement.



Risk of damage – edge drop off on a straight stretch – This is a lower risk when compared to a similar edge drop off on a narrower stretch.

## Risk Management cont...



Risk Register and Risk Documentation – documents strategic risk parameters as well as operational risk parameters.



Location of High Risk Zone

# SECTION 7

## Predictive Modelling and Life Cycle Costing

### Definitions:

Life cycle planning is a key asset management tool that takes into account the whole-of-life implications of acquiring, operating, maintaining and disposing of an asset. It is an integral part of strategic asset management, and enables strategic budgeting and operational decisions to be made using appropriate evaluation tools and decision-making criteria.

Prediction Modeling is a simulation of asset performance characteristics that will enable analysis of the future performance of the asset portfolio. Typically, a performance model will be able to justify future funding levels, future service levels and future capital and maintenance budgets.

The primary technique in undertaking life cycle planning is life cycle costing- a widely used method of financial evaluation of any assets.

### 7.1 Fundamentals of Life Cycle Planning

Establish the total costs of an asset over its predicted life cycle. This total cost must include maintenance. Maintenance costs have a huge impact on total life costs, particularly when a discounted cash flow analysis is used.

- Plan for the impact of refurbishment and cyclical maintenance.
- Increase the service delivery capacity or income generating power of the asset (Ports and Mining).
- Life cycle planning enables the most appropriate option (during any phase of an assets life cycle) to be selected. The results of life cycle planning are often formally documented in the asset management plan.
- Establish a sound basis on which decisions are made (i.e. evaluating the total cost of any strategy or funding allocation or operational decision, rather than just looking at the short-term impact, or initial capital costs). This is shown in the example below for a small infrastructure plant item:

**Option A** – Costs \$90,000 to purchase, \$10,000 to install, \$2000 per year for maintenance, \$3,000 per year for electricity and \$2,000 per year to clean.

Item	2005	2006	2007	2008	2009	2010
Purchase Cost	\$90,000					
Installation Cost	\$10,000					
Maintenance Cost		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Utility Cost		\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Cleaning Cost		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
<b>Total</b>	<b>\$100,000</b>	<b>\$7,000</b>	<b>\$7,000</b>	<b>\$7,000</b>	<b>\$7,000</b>	<b>\$7,000</b>

## Predictive Modelling and Life Cycle Costing cont...

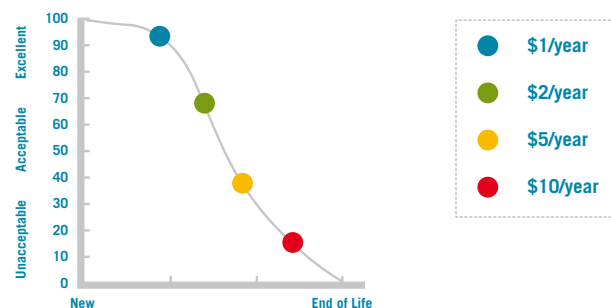
**Option B** – Costs \$96,000 to purchase, \$11,000 to install, \$1,400 per year for maintenance, \$1,500 per year for electricity and \$2,000 per year to clean.

Item	2005	2006	2007	2008	2009	2010
Purchase Cost	\$96,000					
Installation Cost	\$11,000					
Maintenance Cost		\$1,400	\$1,400	\$1,400	\$1,400	\$1,400
Utility Cost		\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Cleaning Cost		\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
<b>Total</b>	<b>\$107,000</b>	<b>\$4,900</b>	<b>\$4,900</b>	<b>\$4,900</b>	<b>\$4,900</b>	<b>\$4,900</b>

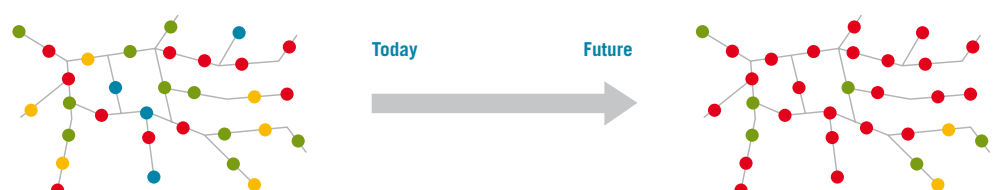
Option B, which has a higher upfront cost, is therefore a better alternative, provided the community well beings and benefits can be established.

### 7.2 Prediction Modeling Fundamentals

Prediction Modeling is a simulation of an asset's performance over its life cycle. As the condition or service capacity of the asset deteriorates, the cost of maintaining the asset escalates and the renewal back-log escalates. This impacts on the future life cycle costs.

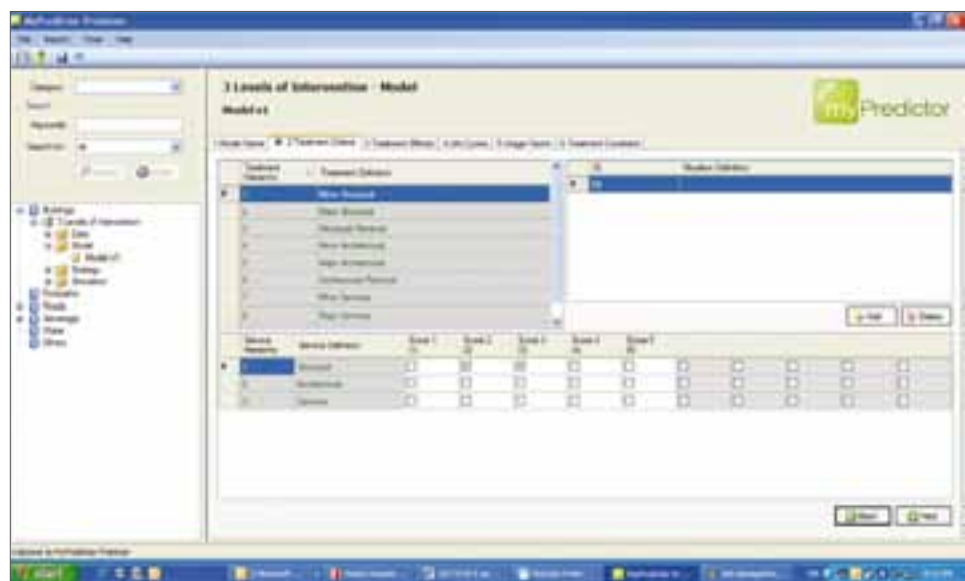


At a whole portfolio level, prediction modelling allows agencies to determine future strategies to mitigate the risks of cost blow-outs.



## Predictive Modelling and Life Cycle Costing cont...

- In essence, a good performance model will enable agencies to answer the following questions:
- What is the present health of the asset and is it above an acceptable level of service?
- What is the cost of bringing our asset stock up to satisfactory standards?
- What is the future maintenance funding required to keep the asset stock at satisfactory standard?
- How much would we need to spend to deliver the current level of service for the next five, ten, twenty, fifty years?
- How much would we need to spend to improve our asset network over five, ten, twenty years?
- If we spent less, what would the impact be on condition and levels of service in the future?
- What is the rate of the current asset consumption and does the funding match that consumption?
- What is the minimum maintenance expenditure required for achieving an adopted strategy?
- If we increased our periodic maintenance, how much does that save in future routine maintenance and vice-versa?



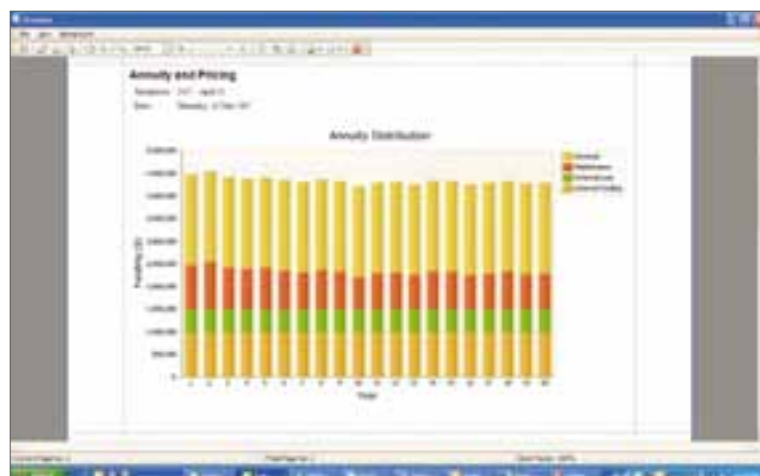
Typical Decision Model for Prediction in myPredictor



## Predictive Modelling and Life Cycle Costing cont...



Works Program – Capital Works for next five years split by Council Ward



Total Life Cycle Annuity Profile – shows the total cost over a life cycle in terms of acquisition, maintenance, ongoing renewals for a portfolio of aquatic centres. Graph also includes internal funding costs and external loan costs.

# SECTION 8

## About Assetic



### 8.1 Assetic's software suite



### 8.2 Contact Assetic

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