Introduction to Asset Management

Asset management is first and foremost a process to help you run your systems in a better way.

Asset Management is not the part that’s the burden
Running a water system is the burden
Asset Management is intended to reduce your burden
An Example: White Cliffs Mutual Domestic Water Consumers Association in Gallup, NM

What Elements Do You See in The White Cliffs Story?

What Asset Management Is (and What It Isn’t)

Asset Management is a Journey not a Destination

Asset Management is a Thought Process not a Computer Program
The more you do the more benefit you receive, BUT….Doing even a little bit will improve the operation and management of your system

It’s not a choice between doing asset management or not; Regardless you are making decisions regarding your assets every single day!!!

**Questionnaire**

The AM Thought Process Involves 5 Areas:

What do you own and what are the characteristics?

What do you want your assets to do?
Which assets would be critical to providing whatever it is you want to do?

How would you operate, maintain, repair, rehabilitate or replace your assets to make sure they keep providing what you want?

How will you pay for what you want to do with your assets (i.e., the operation, maintenance, repair, rehabilitation, and replacement)?

The thought process works with ANY assets

I use it all the time.

How about a real life story of how.

When done right, asset management really works to save money, time, effort….. It works even if it isn’t done “right” as long as the thought process is followed.
AM starts with what you already know and builds from there.

It uses your entire staff, however many that may be.

If you keep an open mind, you will walk away after this course with some ideas on how to change the way you currently do business to help yourself, your management, and your customers.

Your Baseline

AM IQ
https://southwestefc.unm.edu/AssetManagementIQ
CURRENT STATE OF THE ASSETS

WHAT ASSETS DO YOU OWN?

WHERE ARE YOUR ASSETS?

WHAT CONDITION ARE THEY IN?

WHAT IS THEIR REMAINING USEFUL LIFE?

WHAT IS THEIR REPLACEMENT VALUE?
WHAT ASSETS DO YOU WANT TO TRACK?

GIVE ASSETS ID NUMBERS

START WITH THE DATA YOU HAVE

LOTS OF WAYS TO STORE DATA

INVENTORY IN PAPER!

WHERE TO START YOUR INVENTORY
Green Village Workshop

Discuss relevant information on Green Village’s sewer infrastructure.

Look at inventory worksheets

Look at condition worksheets

QUESTIONS
When you know better you do better  

Maya Angelou

WATER UTILITIES ARE FIRST AND FOREMOST CUSTOMER SERVICE BUSINESSES

SO IT’S ALL ABOUT THE CUSTOMERS

LEVEL OF SERVICE

CUSTOMER SERVICE IN ASSET MANAGEMENT TERMS

Called Level of Service

Defines the major goals of the utility (defines what level of service the utility will provide)

LEVEL OF SERVICE IS A CHANCE TO

Have a conversation with customers

Understanding of costs

Service and cost are related

Higher levels of service = higher costs
Lower levels of service = lower costs

AM IN ACTION: IT’S ABOUT CUSTOMERS

Kevin Campanella,  
City of Columbus, OH
**SMART Goals**

1. **SPECIFIC**
   - Provide good water
   - Have good pressure
   - Meet SDWA primary drinking water standards 100% of the time
   - Provide minimum water pressure of 50 psi throughout the system 95% of the time

2. **MEASURABLE**
   - Have exceptional customer service
   - Provide reliable water service
   - Respond to water quality complaints by next business day 95% of the time
   - Provide water continuously to all customers 95% of the time

3. **ATTAINABLE**
   - Provide customer service response within 8 hours during normal business operation (M–F, 8–5)
   - Provide response to all customer complaints within 15 minutes at all times (is not achievable if you have no staff available to respond to complaints)

4. **REALISTIC**
   - Reduce per capita water use by 20% within 3 years through a water conservation program
   - Reduce overall water use by 20% within six months through a water conservation program
"Breaks will be fixed within 8 hours of discovery 90% of the time."

Stacy Gallick, Formerly with Johnson County Wastewater, Kansas

"Breaks will be fixed when discovered."

AM IN ACTION: MEASURING LEVEL OF SERVICE GOALS

"Everything should be made as simple as possible, but not simpler."

Albert Einstein

Keep it Simple and Sustainable

AM IN ACTION: KEEP IT SIMPLE

CONSIDER HOW GOALS CHANGE YOUR OPERATION AND MANAGEMENT

GOAL ARE NOT SET IN STONE

GOALS CAN BE CHANGED

OR ADJUSTED OVER TIME

GOALS CAN BE ADDED OR REMOVED
Level of Service Activity

QUESTIONS?
When you know better you do better

CRITICALITY

Eric Saylor, Cincinnati, OH

CRITICALITY OF ASSETS

What is the likelihood that an asset will fail?

What is the consequence if the asset does fail?

ASSET RISK

FAILURE MODES

MORTALITY
LEVEL OF SERVICE
CAPACITY
FINANCIAL INEFFICIENCY

FAILURE MODES

MORTALITY
FAILURE MODES

LEVEL OF SERVICE

HAVE 4" NEED 6"

FAILURE MODES

CAPACITY

As

FAILURE MODES

FINANCIAL INEFFICIENCY

More to fix than to replace

ASESSING CONSEQUENCES?

FINANCIAL

ENVIRONMENTAL

SOCIAL

CONSIDER THE TRIPLE BOTTOM LINE

CALCULATING CRITICALITY

POF = PROBABILITY OF FAILURE

COF = COST OF FAILURE

Redundancy Factor = RF

Criticality = POF X COF X RF

WAYS TO REDUCE RISK

Routine & Preventative Maintenance
Redundancy
Spare Parts
Specialized Training
Replace Assets Early
Monitoring
ASSESSING CRITICALITY: A SIMPLE EXAMPLE

FACTORS TO CONSIDER FOR

PROBABILITY OF FAILURE

Aesthetic Water Concerns

Depth of Well

FACTORS TO CONSIDER FOR

CONSEQUENCE OF FAILURE

Scores for PoF

Scores for CoF

Risk Scores for Wells
VISUAL DISPLAY OF EXAMPLE DATA

What does the data say?

DOES IT MAKE SENSE?
DO YOU CARRY TOO MUCH RISK, NOT ENOUGH OR JUST RIGHT?

WHAT IF IT LOOKED LIKE THIS?

Or this?

CRITICALITY CHANGES

✓ CRITICALITY IS NOT STATIC
✓ EACH DAY CRITICALITY CHANGES SLIGHTLY
✓ NEED TO REASSESS CRITICALITY AT LEAST EVERY YEAR IF NOT SOONER
✓ REASSESS WHEN MAJOR CHANGES ARE MADE (UPGRADES, REPLACEMENTS, MAJOR CONSTRUCTION, REHABILITATION, REDUNDANCY ADDED)

What about Green Village?

• What is the probability of failure for the sewer line and the blower?
• What is the consequence of failure for the sewer line and the blower?
• Which item is more critical?
• Why?
• How would you approach managing these assets?
CRITICALITY IN ACTION

Frank Roth, ABCWUA, Albuquerque, NM

QUESTIONS?
Life Cycle Costing

When you know better you do better

- CAPITAL COSTS
- O&M
- Repairs
- Rehab

VS. LIFE CYCLE COSTS

- MANAGEMENT
- O&M
- Rehab

COSTS OVER ENTIRE LIFE

An Example

- Initial Cost = 100,000
- O&M per Year = 2,000
- Repair Costs = 30,000
- Rehab = 60,000
- Life of Asset = 30

ADDITIONAL MAINTENANCE, REPAIR AND REHAB TO FORESTALL REPLACEMENT

- Initial Cost = 90,000
- O&M Per Year = 500
- Repair Costs = 5,000
- Rehab = 0
- Life of Asset = 10

DEFERRED MAINTENANCE: REPLACE MORE OFTEN

Life Cycle Costing is About Balance

- O&M
- REPAIR & REHAB
- REPLACEMENT

30 YEAR HORIZON
TOTAL COST
$250,000

30 YEAR HORIZON
TOTAL COST
$300,000

Capital Cost
Impact on what you choose to do?

Life Cycle Cost
MAINTENANCE ACTIVITIES

ROUTINE

PREDICTIVE

PREVENTATIVE

ROUTINE MAINTENANCE
BASED ON CRITICALITY

<table>
<thead>
<tr>
<th>Routine Maintenance</th>
<th>Routine Maintenance</th>
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<tbody>
<tr>
<td>25%</td>
<td>30%</td>
</tr>
<tr>
<td>20%</td>
<td>25%</td>
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PREVENTATIVE MAINTENANCE
BASED ON CRITICALITY

<table>
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<tr>
<th>Preventative Maintenance</th>
<th>Preventative Maintenance</th>
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<tbody>
<tr>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>10%</td>
<td>30%</td>
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PREDICTIVE MAINTENANCE OR MONITORING
BASED ON CRITICALITY

<table>
<thead>
<tr>
<th>Predictive Maintenance Or Monitoring</th>
<th>Predictive Maintenance Or Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
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<td>75%</td>
</tr>
<tr>
<td>0%</td>
<td>5%</td>
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AM in Action: Preventative Maintenance

Jeff Jochim, Timber Creek Sewer Company
### TRACKING O&M COSTS

<table>
<thead>
<tr>
<th>Asset ID</th>
<th>Asset Category</th>
<th>Asset Type</th>
<th>Annual O&amp;M Costs</th>
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</thead>
<tbody>
<tr>
<td>RW1PFB</td>
<td>Raw Water</td>
<td>Pump</td>
<td>$4,523</td>
</tr>
<tr>
<td>RW2PFB</td>
<td>Raw Water</td>
<td>Pump</td>
<td>$6,955</td>
</tr>
<tr>
<td>RW1PHA</td>
<td>Raw Water</td>
<td>Pump</td>
<td>$3,760</td>
</tr>
<tr>
<td>RW2PFB</td>
<td>Raw Water</td>
<td>Pump</td>
<td>$4,145</td>
</tr>
</tbody>
</table>

### SHIFT FROM REACTIVE TO PLANNED OPERATION

[Image of sign with arrows pointing in opposite directions, one labeled 'EXPENSIVE' and the other 'CHEAP']

### REACTIVE VS. PLANNED OPERATION: AN EXAMPLE

[Image of water meter readings]

**JOHNSON COUNTY, KANSAS**

### AM IN ACTION: REACTIVE VS. PROACTIVE OPERATION

Mark Winslow and Jerry Morse, ABCWUA, NM

### Life Cycle Costing Workshop

- Water valve exercising example
- Answer questions as a group.
- Weigh costs vs. benefits

### CAPITAL ACTIVITIES

[Image of sticky notes with labels: REHAB, REPAIR, REPLACEMENT]
HOW TO DECIDE WHEN TO REPAIR, REHABILITATE, REPLACE

AM in Action: Replacement Decisions
Kevin Campanella, Columbus, OH

CAPITAL PROJECTS

AM in Action: Capital Savings
Kevin Campanella, Columbus, OH

LOOK CAREFULLY AT HIGH DOLLAR PROJECTS

Questions
Long Term Funding Strategies

What are your funding needs?

Day to day expenses? (O&M)

Capital expenditures (long term expenses)

WHERE WILL THE MONEY COME FROM?

O&M – General funds, other funds, rates, fees, penalties

Capital projects – system funds and/or outside funding (grants, loans)

FUNDING ISSUES

ASSET REPLACEMENT WAVES

FULL COSTS OF OPERATION

Operations
- Electric
- Water
- Wastewater

Repairs
- Plant
- Wastewater

Maintenance
- Electric
- Water
- Wastewater

Reserve Asset Replacement/Waves

Replacement
- Pumps & Piping
- Towers & Pumps

Full service
- Electric
- Water
- Wastewater

Interest
- Electric
- Water
- Wastewater

Emergency
- Electric
- Water
- Wastewater

Diet Service
- Electric
- Water
- Wastewater

Revs & Profits
- Electric
- Water
- Wastewater

When you know better you do better

Maya Angelou
A DOLLAR IS A DOLLAR?

CHARGING FOR WATER – CONSIDERATIONS

Determining what to charge
Developing Rate Structures
Policies
Community & Administration Support

OLD FORGE, NY

Taking it to your system
• What tools will you use to improve management of your system?
• Who will you share this information with?
• What are the gaps you need to fill?

TED RIEHLE

Wichita State University Environmental Finance Center
Technical Assistance:
- Energy Assessments at water/wastewater plants
- Capital Improvements Planning
- Asset management assistance
- Rates analysis
- Replacement/rehab of aging infrastructure
- Ask for specific help

Contact:
Nicholas Willis, Program Manager
nicholas.willis@Wichita.edu
316-978-6538

Questions