INTRODUCTORY ASSET MANAGEMENT PLANNING FOR WASTEWATER SYSTEMS

Overview

- Why Asset Management (AM) Is Needed?
- What can you get from it?
- US EPA's Asset Management Elements and Steps
- Delve more into a basic Asset Management program
- How do I begin?
- Where do we go from here?

EXAMPLE

Why Asset Management Is Needed?

- Prolonging asset life and improving decisions about asset rehabilitation, repair, and replacement
- Meeting consumer demands with a focus on system sustainability
- Setting rates based on sound operational and financial planning
- Budgeting focused on critical activities for sustained performance
- Meeting service expectations and regulatory requirements
- Improving responses to emergencies
- Improving the security and safety of assets
- Reducing overall costs for both operations and capital expenditures

Simple Necessity Based Goals

- Decreasing risk for all parties involved
- Continuously monitoring system
- Planning for the future

Minimum Criteria

- Full Managerial, Technical, and Financial Capabilities
- Highlight Critical infrastructure areas that will need addressed
- Identify upcoming projects in 5, 10, 20 year horizons
- Identify when items need replaced
- Identify contingency plans for failure of components

US EPA's 5 Core AM Elements

1. What is the current state of my assets?

- What do I own?
- Where is it?
- What condition is it in?
- What is its remaining useful life?
- What is its remaining economic value?

2. What is my required "sustainable" level of service?

- What is the demand for my services by my stakeholders?
- What do regulators require?
- What is my actual performance?

3. Which assets are critical to sustained performance?

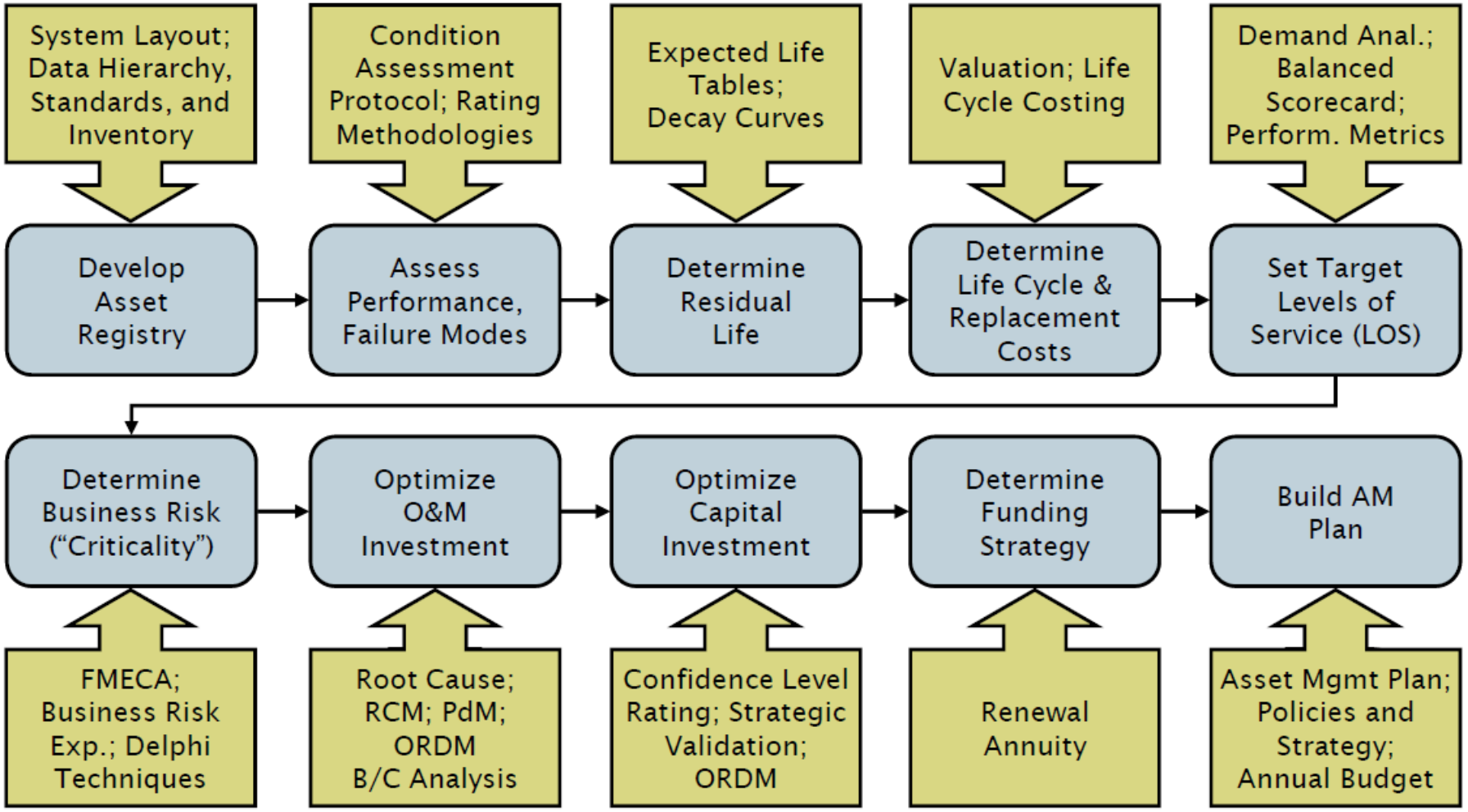
- How does it fail? How can it fail?
- What is the probability of failure?
- What does it cost to repair?
- What are the consequences of failure?

4. What are my minimum life-cycle costs?

- What alternative management options exist?
- Which are the most feasible for my organization?

5. What is my best long-term funding strategy?

US EPA's AM 10-Step Process



Asset Management Provisions

- Asset Management Program shall include:
  - Inventory and evaluation of all assets — **Current State of Assets**
  - Operation and maintenance programs — **Life-Cycle Costs and Risk**
  - Emergency preparedness and contingency planning program — **Risk**
  - Criteria and timelines for infrastructure rehabilitation and replacement — **Levels of Service**
  - Approved capacity projections and capital improvement planning — **Levels of Service**
  - Long-term funding strategy to support asset management program implementation — **Long Term Funding**

Managerial Capabilities

- Documentation of Ownership
- Certified Operators
  - Copies of certificates
- Non-technical description of wastewater system
  - Executive summary
    - Treatment type
    - Feet of collection system
    - Quantity of valves, lift stations, etc.
    - Number of customers
    - Plant Assets

Managerial Capabilities

- Operations Plan
  - Training Records of team
  - Team Hierarchy Chart
  - Succession Planning
- Written Procedures
  - Personnel
  - Operational
- Inventory of Contacts and Resources (Emergency Contingency Plan)
- Contracting and Purchasing Procedures

EXAMPLE

Technical Capabilities

- Map and Schematic of Assets
- Inventory of Assets
  - List
  - Discernable by zones
- Evaluation of Assets
- Level of Service Goals*
- O & M Programs
  - Routine Maintenance
  - Location of O&M Manuals

Technical Capabilities

- Emergency Preparedness and Contingency Plan
- Approved Capacity
- Criteria and Timeline for Rehabilitation and Replacement
  - Age based replacement
  - I&I based replacement
  - Valve wont operate
  - Pump wont operate

EXAMPLE

Financial Capability (Ohio EPA - Draft Contents)

- Capital improvement plan
- Pro-forma statements (5 years previous and 5 years projected)
- Income statement
- Balance sheet
- Statement of cash flow
- Amortization schedule for outstanding debt
- Capitalization terms of debt
- Current wastewater rate
- Documentation of all customers billed
- Information demonstrating bond or credit rating

EXAMPLE

How do I Build an Asset Management Plan?

- Pull together all available information on assets and need to write it down
- An asset management program is more than just a tracking system, it’s a living document
- A software system helps for more complex systems to manage assets
- Asset management is a business model that make us understand – What we do it, Why we do it, How we do it, Where we invest, What our costs are, and What our return is.

What can I do to start?

- Simple Desktop Management Plan
  - What do we have?
  - Who works for us? Who can we call?
  - What/where are our SOP's?
  - Why do we bill what we bill?
- Identify Core Deliverables, their value to you, and what you would consider key performance metrics.
  - Customer Complaints?
  - EPA violations?

EXAMPLE

What can I do to start?

01

Inventory and inspect each asset

- Condition assessment
- Unknowns
- Cost to replace

02

Map assets

- Google Maps
- GIS

03

Age Verification

- Plans
- Best guess information

What can I do to start? - Criticality

What assets are most critical?	• Most expensive? • Most necessary?
What would happen if each asset failed?	• Loss of service? • Violation? • Fines?
Is there any redundancy of the asset?	• Work around? • Second asset?

What can I do to start?

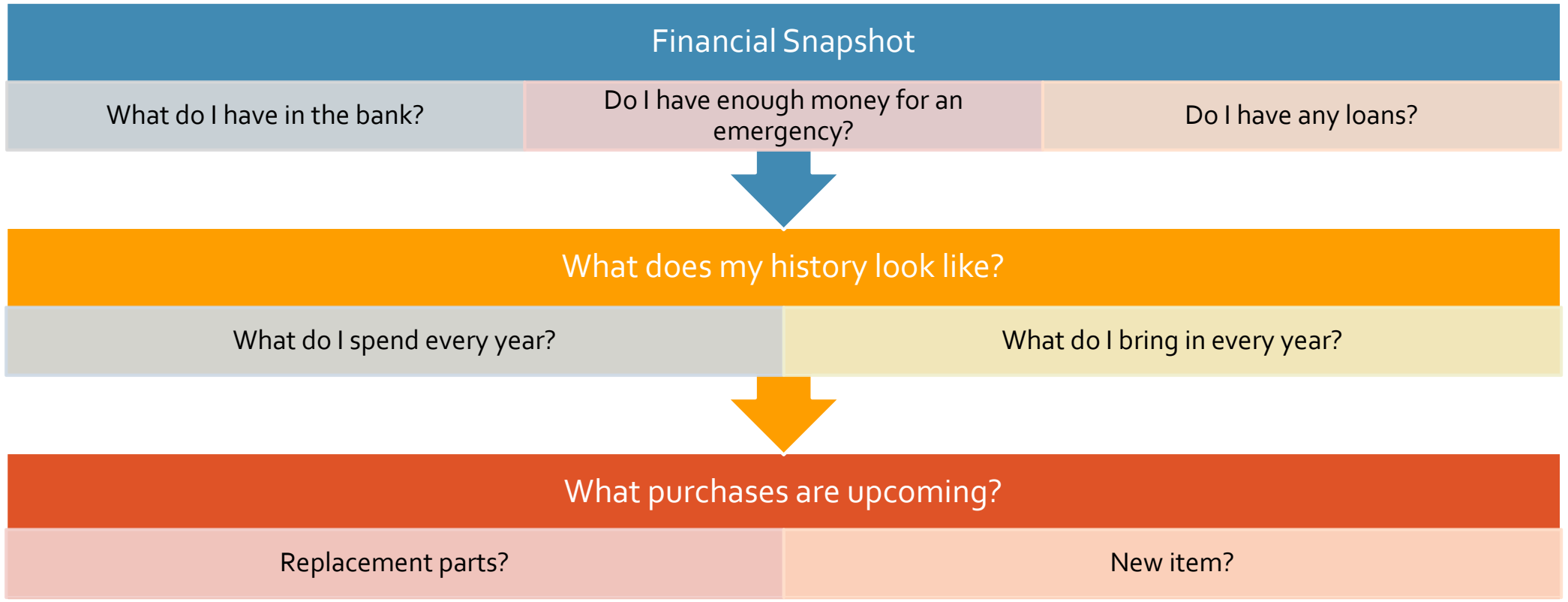
WTP	Water Treatment Plant									
	Manganese Greensand Filter #1	1983		40	93	40	66	10		$ 125,000.00
	Manganese Greensand Filter #2	1983		40	93	40	66	10		$ 125,000.00
	High Service Pump #1	2019		25	4	20	12	10		$ 25,000.00
	High Service Pump #2	2019		25	4	20	12	10		$ 25,000.00
	High Service Pump #3	2019		25	4	20	12	50		$ 35,000.00
	Chlorine Reaction Tank	1983		40	93	40	66	50		$ 125,000.00
	Chlorine Injector	2019		25	4	20	12	50		$ 1,000.00
	Generator	2019		40	3	20	11	10		$ 30,000.00

Asset ID #	Asset ID	Install Date	Description	Estimated Effective Life (Yrs)	Consumed Life Ranking (1-100)	Condition Ranking (1-100)	Probability of Failure (PoF)	Consequence of Failure (CoF)		Unit Cost
WST	Water Storage Tanks									
	Storage Tank #1	2019		80	1	20	11	10		$ 150,000.00

Asset ID #	Asset ID	Install Date	Description	Estimated Effective Life (Yrs)	Consumed Life Ranking (1-100)	Condition Ranking (1-100)	Probability of Failure (PoF)	Consequence of Failure (CoF)		Unit Cost ($/LF)
WL	Water Lines (10,697 ft)									
	1,671' of 2" PVC Waterline	1985		80	44	43	43	40		$ 25.00
	6,943' of 6" PVC Waterline	1985		80	44	43	43	40		$ 40.00
	2,083' of 3" Raw Water PVC line	1985		80	44	43	43	40		$ 40.00

EXAMPLE

What can I do to start?



EXAMPLE

What is the bad news?

- Not every asset is the same
- Conditions are not always know
- Assets are not all brand new
- Some assets are more critical than others
- It seems very daunting
- Some knowledge is not written down

What is the good news?

- Its never too late to start
- Most of these things are already being done, they just aren’t written
- Seeking Funds via WPCLF or other funding sources is a viable financial option to begin with
- More information = better knowledge
- Some assets are more critical than others

Where do I go from here?

- Remember, Asset Management is a living document
- How often do I update it?
- Who should be involved in updating?
- What do we do with this information?
  - What does your future look like?

Where do I go from here?

- Set up new best practices
- Continuous condition assessment
- Set money aside
  - Emergency funds
  - Asset replacement plan
- Further move into a GIS/Asset Tracking system

Remember

- This is what you make of it
- All information is good information
  - Future help
  - Engineering
- The EPA's view of Asset Management
- Proactive vs. Reactive
- Funding

THANK YOU

Kevin White, P.E., ENVSP

IBI Group

Kevin.White@IBIGroup.com

614-818-4900