

A young boy with dark hair and skin is peeking over a large green chalkboard sign. He is giving a thumbs-up with his right hand and holding the sign with his left hand. The background is a bright blue sky with white clouds.

A Crash Course in  
**ASSET  
MANAGEMENT**

# OUTLINE:

- 1 **Background**
- 2 **Fundamentals**
- 3 **Examples**



# Follow the Leaders

## 2006 Statement of Intent Effective Water Sector Utility Management

- EPA
- AWWA
- WEF
- APWA
- AMWA
- NACWA
- NAWC



Australia,  
New Zealand,  
United Kingdom

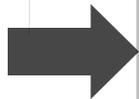
Regulated Asset Management

**Reactive** → **Proactive**

# Asset Management

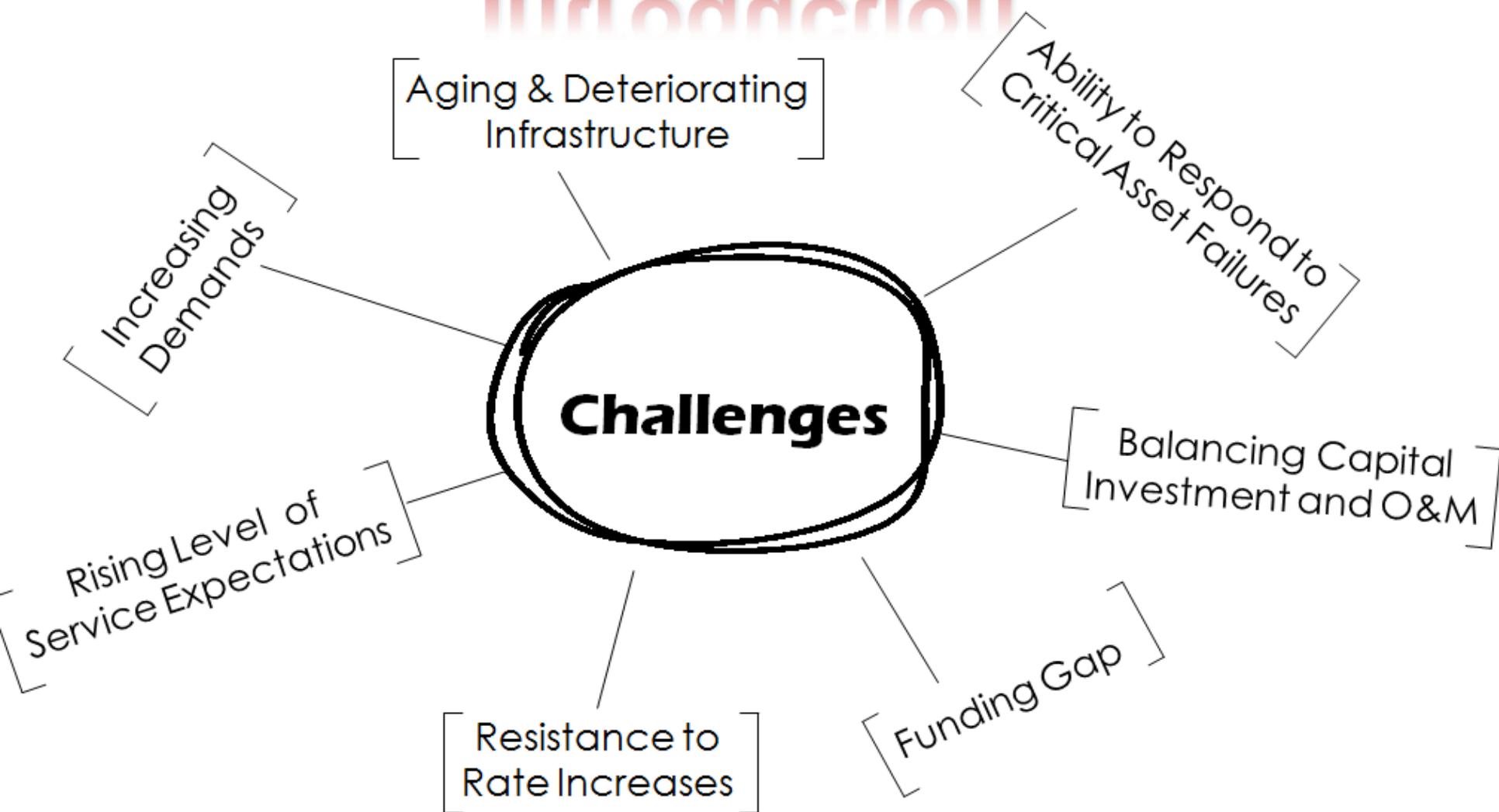
## Definition:

Utility management strategies that target **Operational Efficiency, Responsible Spending, and Long-Term Sustainability**



TARGET THE LOWEST LIFE CYCLE COST  
rehabilitate, repair, or replace assets

# Introduction



# Operational Efficiency

**Do the RIGHT work...**

**Make the RIGHT investments...**

**At the RIGHT time...**

**For the RIGHT reasons!**

[ Stakeholders Support ]



# Responsible Spending

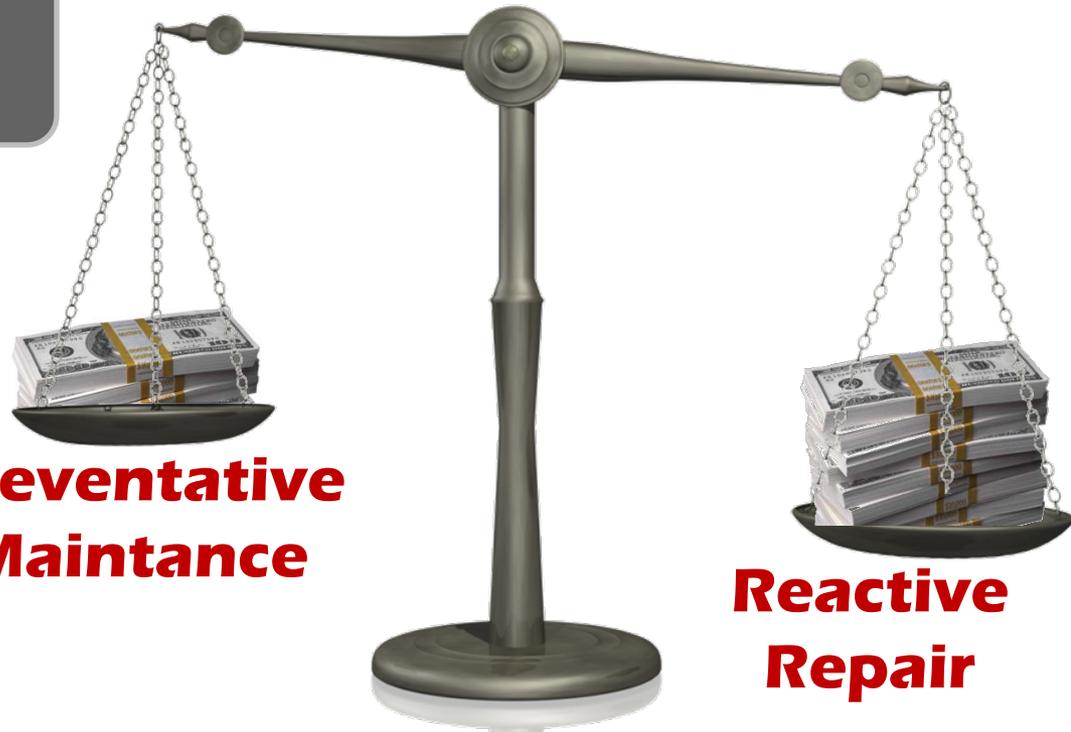
Reduce utility operational expenditures and resource usage, pass savings on to customers.

→ Funding is an Issue

\*Asset Management programs may be required to receive funding

**Preventative  
Maintenance**

**Reactive  
Repair**



# Long-Term Sustainability

“Get the most use, for the longest time, out of existing infrastructure.”

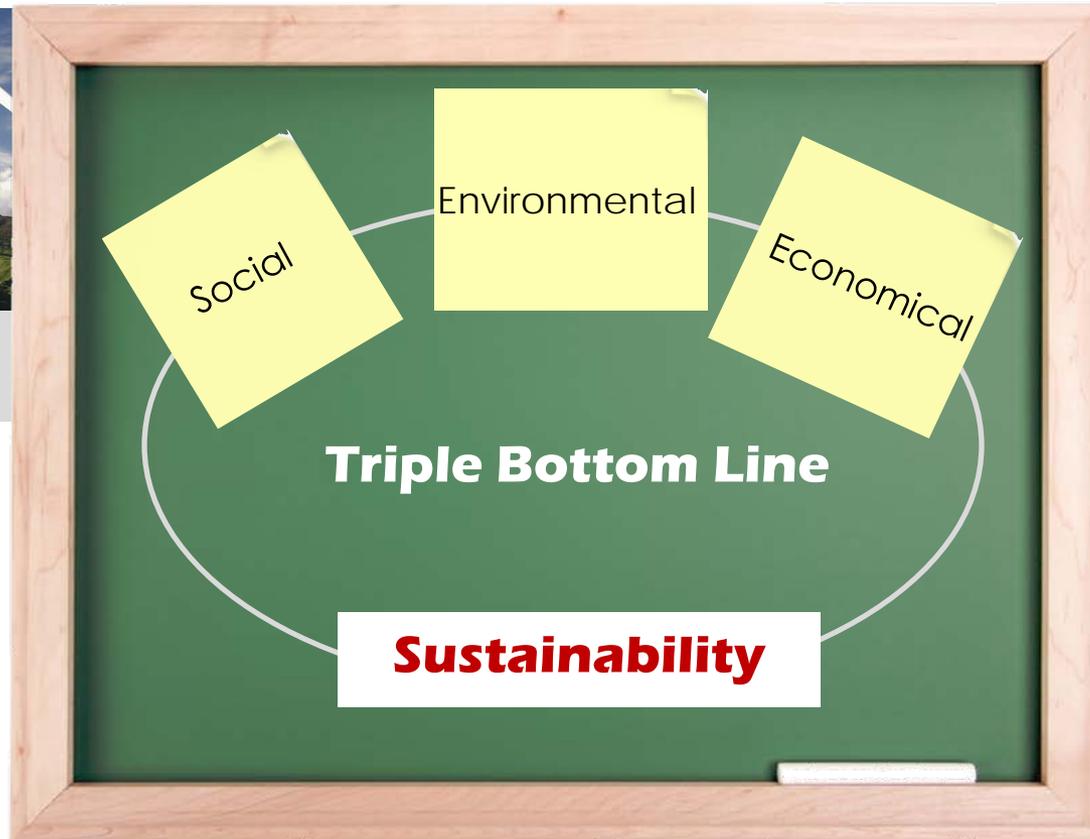
- ➔ Fiscally and socially responsible reinvestment
- ➔ Standardization of institutional knowledge
- ➔ Transfer of operational data to the next generation



# Green/Blue Initiatives



Reduce Energy  
Consumption



Maximize Resource  
Utilization

# Perspectives on AM



**Policy Makers  
&  
Utility Managers**



**Operational  
Staff**

# Perspectives on AM



## Buzz Words



Triple Bottom Line

Zero Net Energy

Sustainability

# Perspectives on AM



**Operational  
Staff**

- ➔ Data Standardization
- ➔ Succession Planning, Knowledge Transfer
- ➔ Lowest Life Cycle Cost – Cost Saving Through Preventative Maintenance
- ➔ Justification for Operational Expenditures, Project Prioritization

## **Buzz Words**



Lowest Cost of Ownership

Stakeholder Support

Sustainability

# Asset Management Cycle

➔ Asset Management is an Operational Strategy

➔ Ongoing Input to Information Databases

- Use tools, every day

➔ Strategic Planning

- Annual
- Long term funding strategies
- Rate design

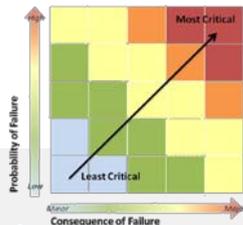
➔ Benchmarking

- What's working
- What isn't
- Gap analysis and fill in holes



# Asset Management In Practice

**Pick what will work for your utility... it's a la carte!**



## Facility and System Planning:

State of Assets  
Risk/Criticality  
Project Prioritization

## Financial Analysis:

CIP  
O&M Budgeting  
Rate Analysis and Design



## Preventative Maintenance:

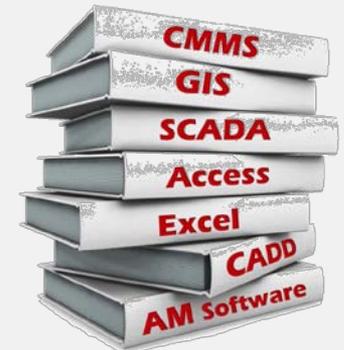
Distribution and Collection System  
Inspection Technologies  
Unidirectional Flushing Programs

## Energy Auditing:

Energy Reduction Strategies



## Toolbox:



# Fairmont WTP

## FACILITY PLAN

**FAIRMONT**

*4.5 MGD Water Treatment Plant*

### **Challenges** ➔

Aging infrastructure  
Regulatory compliance  
Taste and odor

### **Asset Management Strategy** ➔

Evaluate feasibility of rehabilitating existing infrastructure to the extent possible



# Fairmont WTP

State of Assets



Asset Inventory  
Condition Assessment

Levels of Service



Treatment Target Goals  
Triple Bottom Line

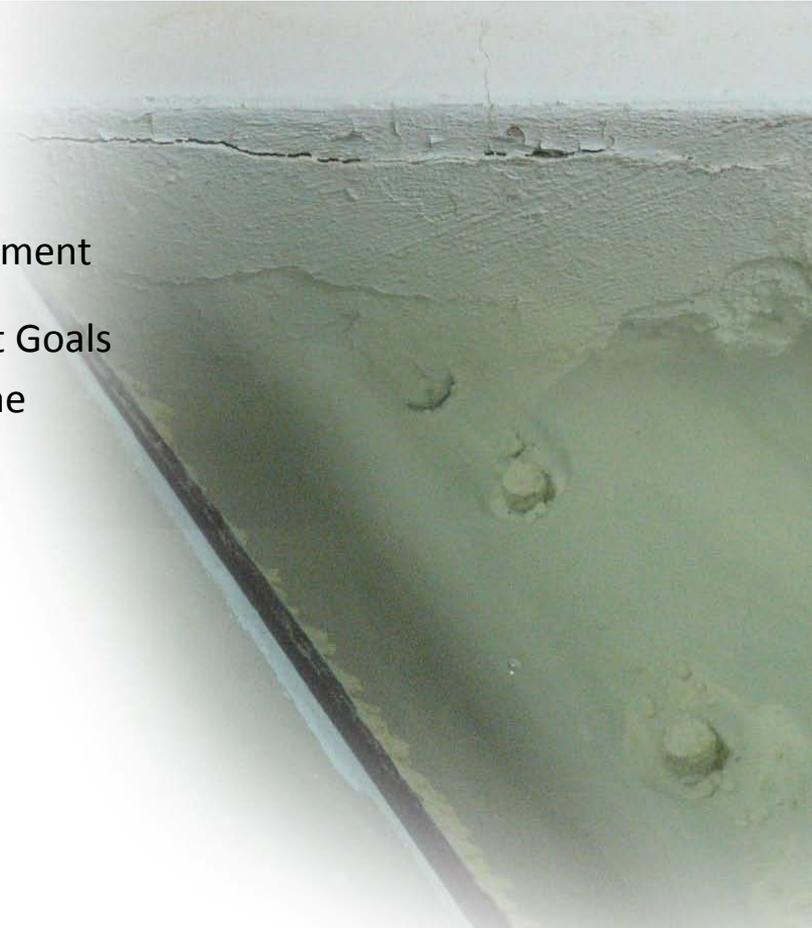
Risk/Criticality



Risk Analysis

Cost Investment

**Lowest Life Cycle Cost = Construct New Facility**

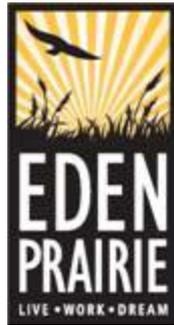


# Eden Prairie

## Utility Rate Design Study

**FINANCIAL ANALYSIS**

**PREVENTATIVE  
MAINTENANCE PROGRAM**



*Water, Sewer, and Storm Drainage Utilities*

Budgeting reinvestment expenditures

**Challenges** ➔

Build-out capacity

Shift from capital system expansion to proactive reinvestment in existing infrastructure

**Asset Management  
Strategy** ➔

Quantify projected infrastructure needs and incorporate into CIP and utility rate planning

# Eden Prairie

## Utility Rate Design Study

State of Assets



Service Life Cycle

Revised Depreciation Model

Cost Investment



Reinvestment: Repair, Rehabilitate, Replace

Developed Reinvestment Annuity

Risk/Criticality



Asset Analysis

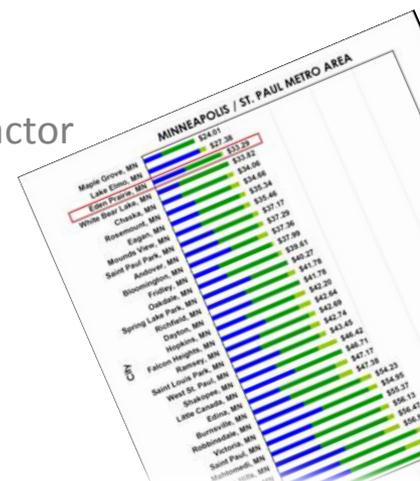
Risk Used to Develop Adjustment Factor

Capital and  
O&M Budgeting



Annual CIP Budget

Utility Rate Design



**Proactive Utility Reinvestment = Sustainability**

# Grand Forks

## Forcemain Inspection

**CIP AND O&M BUDGETING**

**PREVENTATIVE MAINTENANCE PROGRAM**



*PCCP Forcemain System*

**Challenge** →

Reactive maintenance  
Unidentified hydrogen sulfide corrosion



**Asset Management Strategy** →

Use advanced forcemain inspection technology to evaluate integrity of pipelines and identify preventative maintenance opportunities

# Grand Forks

## Forcemain Inspection

State of Assets

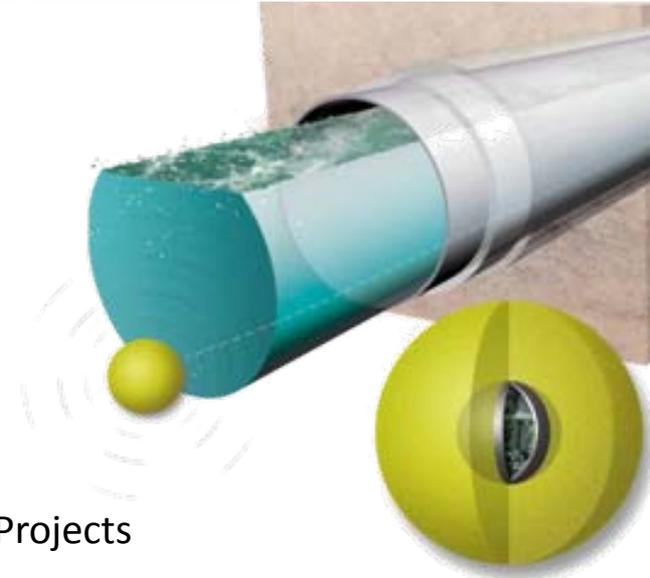


Condition Assessment  
Identify High Risk Pipe

Capital and  
O&M Budgeting



CIP Budget Rehabilitation Projects



**Preventative Maintenance is a  
Sustainability Practice = Reduced Risk, Cost Savings**

# St. Cloud WTF



16 MGD Water Treatment Facility

## Challenge →

- Increase operational efficiency
- Promote preventative maintenance

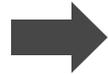
## Asset Management Strategy →

Implement asset management software tool that operates within existing SCADA system



# St. Cloud WTF

State of Assets



SCADA System Data  
Service Life Cycle

Customized Per Operator Experience

Cost Investment



Target Lowest Cost of Ownership

Risk/Criticality



Asset Analysis

Apply to Establish Maintenance Protocols

Capital and  
O&M Budgeting

**Systematic Preventative Maintenance  
= I&C Tools**

# Long-Term AM

**Plant a Seed... Watch it GROW!**

Grand Fork, ND  
Long-term Asset Management Program



# Long-Term AM

**Plant a Seed... Watch it GROW!**

Grand Fork, ND  
Long-term Asset Management Program

## Public Works Level AM Program

### Facility and System Planning:

- ✓ State of Assets
- ✓ Risk/Criticality
- ✓ Project Prioritization

### Financial Analysis:

- ✓ CIP
- ✓ O&M Budgeting
- ✓ Rate Analysis and Design

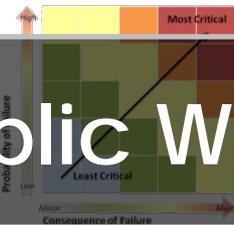
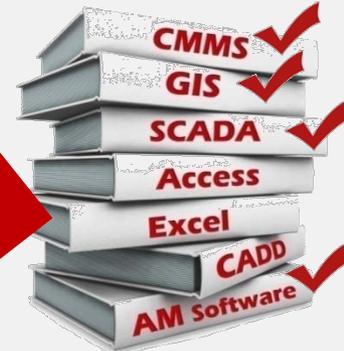
### Preventative Maintenance:

- ✓ Distribution and Collection System Inspection Technologies
- ✓ Unidirectional Flushing Programs

### Electrical/I&C:

- ✓ Energy Reduction Strategies
- ✓ I&C Tools
- ✓ Database Management

### Toolbox:



# Fundamentals of Asset Management

## A "Hands-On" Approach

Presented By the US EPA

November 16 & 17, 2011  
Alerus Center, Grand Forks, ND

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# Questions

