Smart Management for Small Water Systems

Managing Energy at Your Small Drinking Water System – A Workshop Series for New Hampshire Utilities

Workshop 1 – 07/19/16
Ashland Fire Station, Ashland, NH

Facilitator – Stacey Isaac Berahzer

This program is made possible under a cooperative agreement with EPA.

EFCN environmental finance center network

American Water Works Association

UNC ENVIRONMENTAL FINANCE CENTER

Environmental Finance Center Syracuse University

Energy Management Workshop Series

- In-depth workshop focused on building system-specific energy management plans
- Aim is to create a peer network
  - Workshop 1: Collecting data and getting started
  - Workshop 2: Prioritizing and funding projects
  - Workshop 3: Implementing, progressing, and special topics

Working smarter *not harder* is the essence of Effective Management / Asset Management

Mike Daly, White Cliffs, NM Video Profile

Asset Management Helps You Have the Most Impact in Your System By Spending Your Limited Dollars in the Best Way Possible

What you want to do….

Replace all the assets

New tank
New pipe
New pump
New filter

$5 Million

Elected Officials/ Decision-Makers Say No

Second Choice: $3 M

Replace
Some of the
Asset w Pump

Elected Officials/ Decision-Makers Still Say No

Now What?

Repair and Rehabilitate

Rehab Option: $1 M

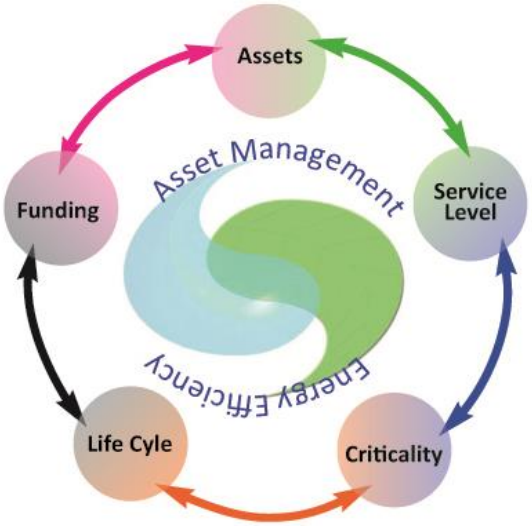
Rehab Assets

Reduced risk almost as low as new assets for 1/5 the cost

What does this type of analysis take?

- Nothing more than following a systematic approach for managing the assets
- 5 core components of Asset Management

Five Core Components of AM



Current State of the Assets

Level of Service

Criticality

Life Cycle Costing

Long-Term Funding

Current State of the Assets

- What do I own?
- Where are the assets?
- What condition are they in?
- How much useful life is remaining?
- What is the replacement value?

Level of Service

Involve Customers

Involve Staff

Measurable Goals: Internal and External

Track Progress Towards Meeting Goals

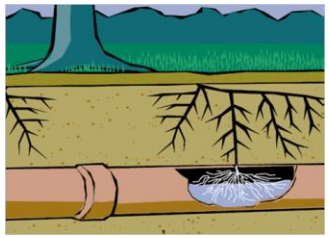
What would my customers want?

Asset Criticality

What is the probability or likelihood that a given asset will fail?

How do my assets fail?

What's the condition of my assets?



Asset Criticality

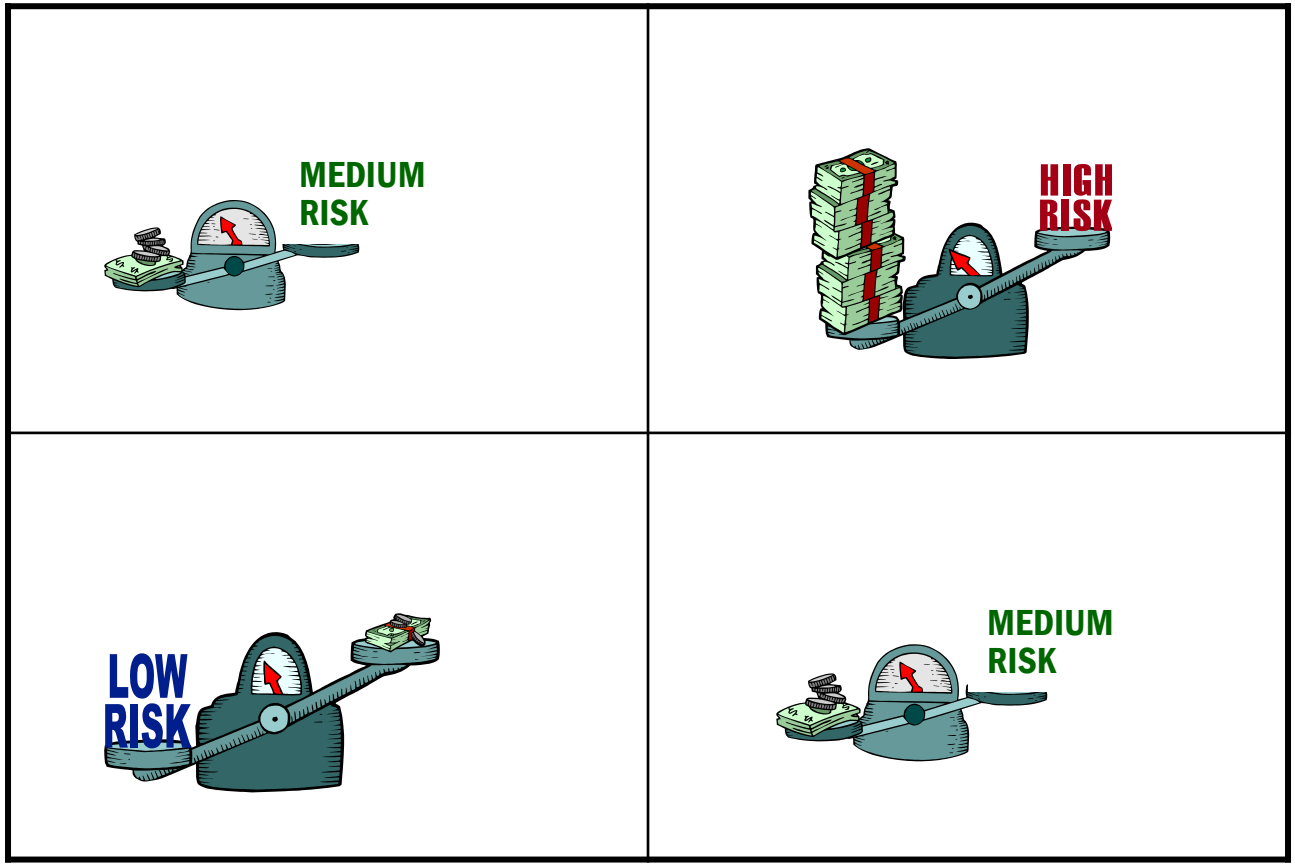
What is the consequence if the asset does fail?

What is the cost of the repair?

Are there legal consequences, environmental consequences, social consequences?

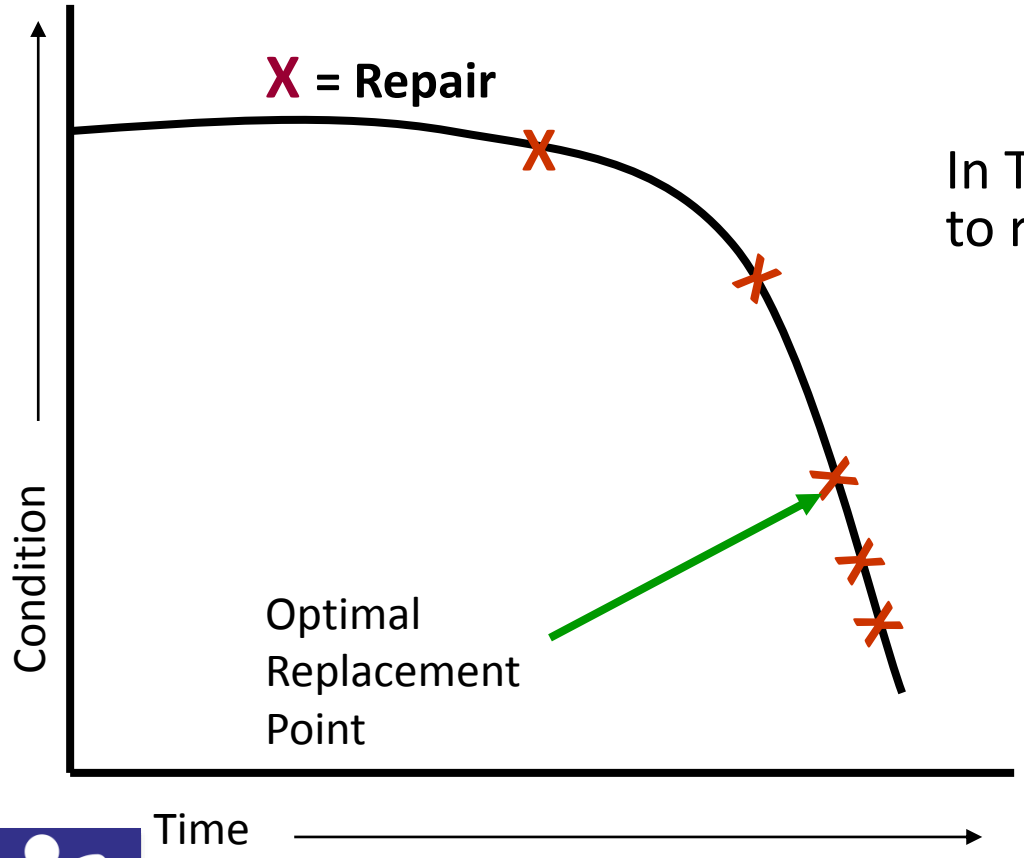
Are there redundant assets?

Asset Criticality



Which category of assets do I care the most about? The least?

Life Cycle Costing: Replacement of Assets



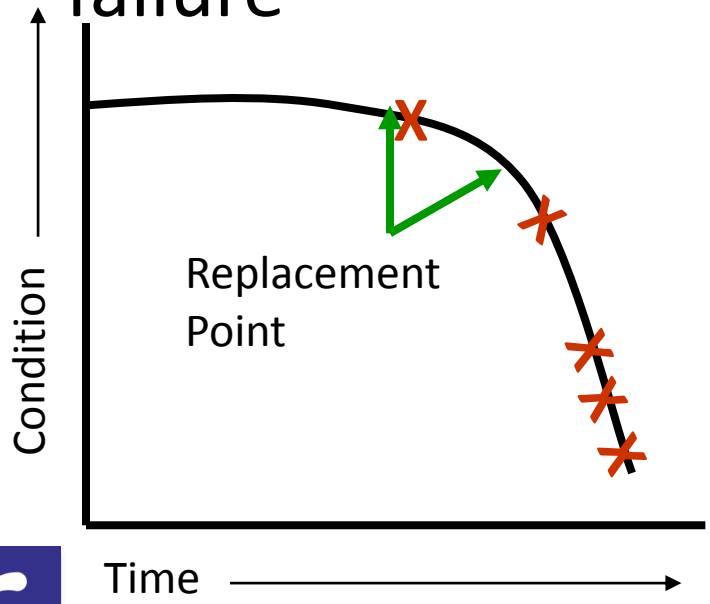
In Theory, there is an exact right time to replace an asset

Not possible to know the optimal time to replace every asset

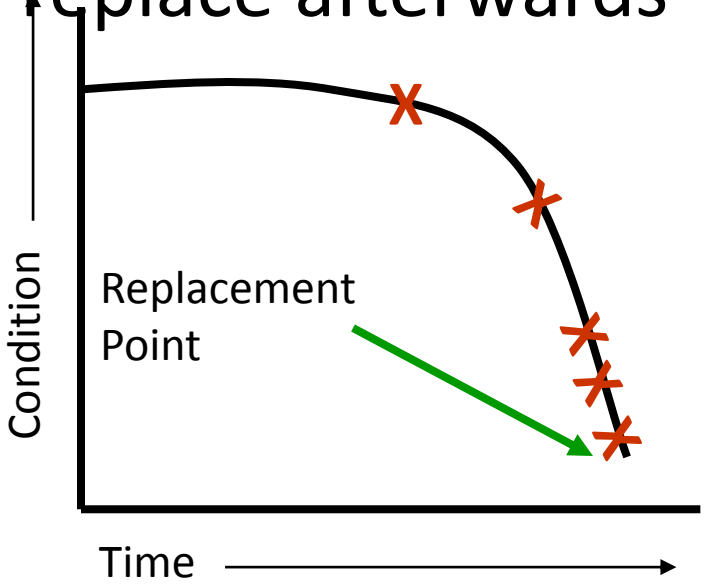
So… need to use the concept of risk

Life Cycle Costing & Risk

High risk: replace assets early, before failure



Low risk assets: run to failure and replace afterwards



Energy Management and Water Loss

Big Picture

- Water and wastewater treatment and **distribution** account for roughly 4% of the nation's total energy use (EPRI, 2002).
- At the utility level, energy costs account for up to 30% of total operating budgets (Black & Veatch, 2012)

“Embedded Energy”

- Embedded Energy is “the total amount of energy used to produce and supply a given quantity of water”
- Fixing leaks and reducing real losses will reduce the amount of water and embedded energy used in treatment & distribution
- Even the smallest utilities with an estimated real water loss ratio of 9% had an embedded energy loss of nearly 400 MWh of electricity

Source: Aubuchon, Craig P.; Roberson, J. Alan, “Evaluating the Embedded Energy in Real Water Loss,” AWWA 2014

"For the average utility in the sample, the monetized benefits from reduced energy use and lower carbon emissions is roughly equal to an additional 5% of the estimated revenue loss from estimated real water losses."

Source: Aubuchon, Craig P.; Roberson, J. Alan, "Evaluating the Embedded Energy in Real Water Loss," AWWA 2014