

# An Introduction to Asset Management

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# Department of Ecology

## Water Quality Grants & Loans

*We're working to protect and restore  
Washington's waters*

- Funding for Wastewater, Stormwater, Onsite Septic, and Non-Point
- [ecy.wa.gov/programs/WQ/funding](http://ecy.wa.gov/programs/WQ/funding)



2017 Conference:  
October 24-26, 2017  
Wenatchee, WA  
[infrafunding.wa.gov](http://infrafunding.wa.gov)



IACC

Infrastructure Assistance Coordinating Council

# Checklist

- Why am I here?
- Handouts.
- Questions.
- Business Cards.
- Talk to me after.



# Debunking the Asset Management Mystique

## Agenda

- What is asset management and why should you care?
- ~~Nuts and bolts~~ *Screwdrivers and ratchets* of asset management.
- Stop making excuses and get started!





# What is “Asset Management”

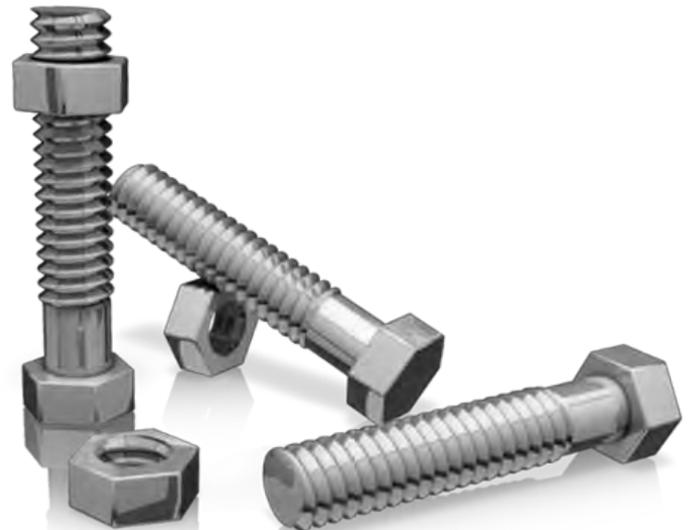
# Myths about Asset Management

- Is it some kind of investment strategy?
- That's some kind of computer database, right?
- That's something our field crews do.
- We're not ready (or too overworked) to start asset management.



# Stop Making Excuses Get Started Today.

- Nobody else is going to do it for you.
- You know more than you think you do.
- Asset Management is easier than it looks.
- You will see benefits almost immediately.



# Asset Management

- A system for monitoring and maintaining *stuff* that has value to your organization, with the goal of optimizing the value of those assets.
- Anyone who owns or manages *stuff* will benefit from asset management.



# What assets are you managing?

- Infrastructure (sewer, water roads)
- IT equipment
- Buildings
- Vehicles
- Tools and Equipment
- Laboratory equipment
- Personnel
- Intellectual Property
- Public Image



# Why manage your assets?



# Asset Management - Multiple Benefits

- Better cared for systems
- Fewer unplanned service disruptions
- Confidence about what you own.
- More effective and better scheduled maintenance
- Better budget estimates (capital and operations)
- Extend the life of assets
- Save money



# Just the Facts

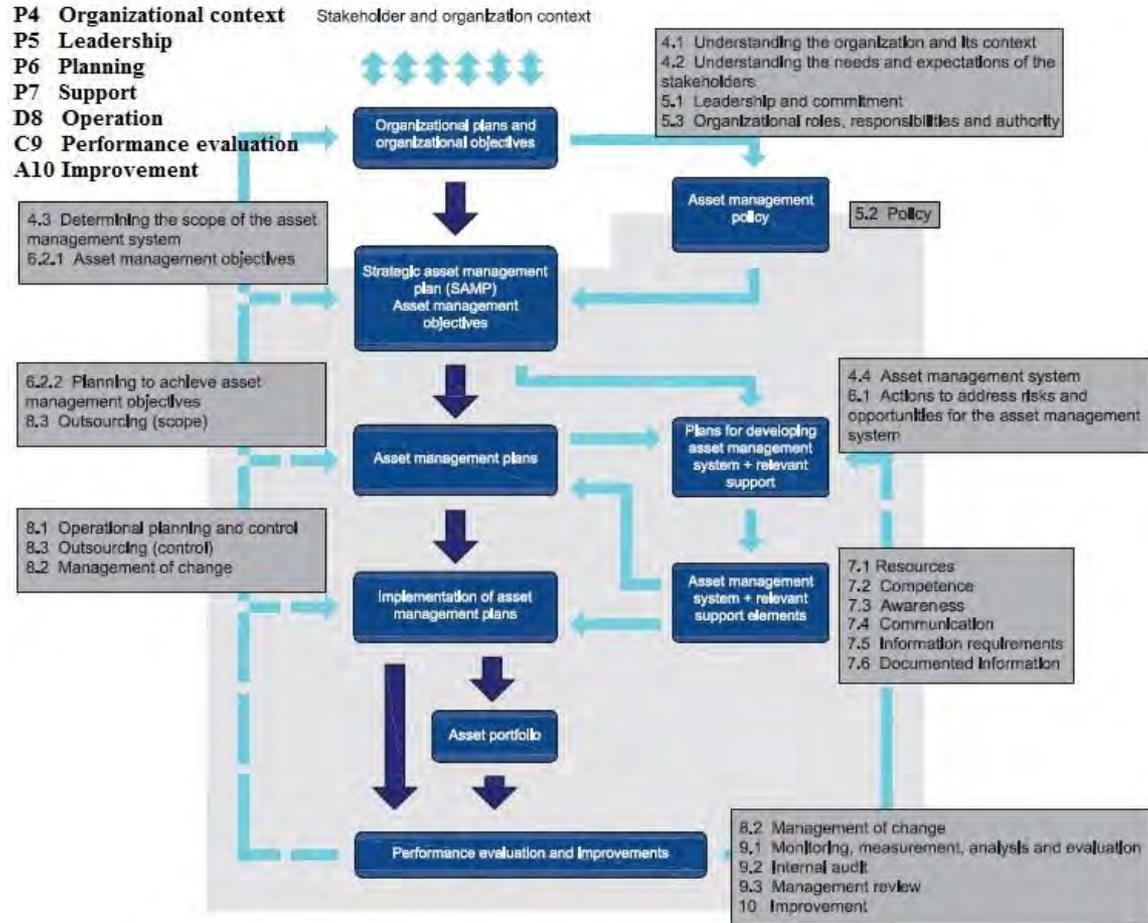
- Nothing lasts forever.
- Everything costs money.



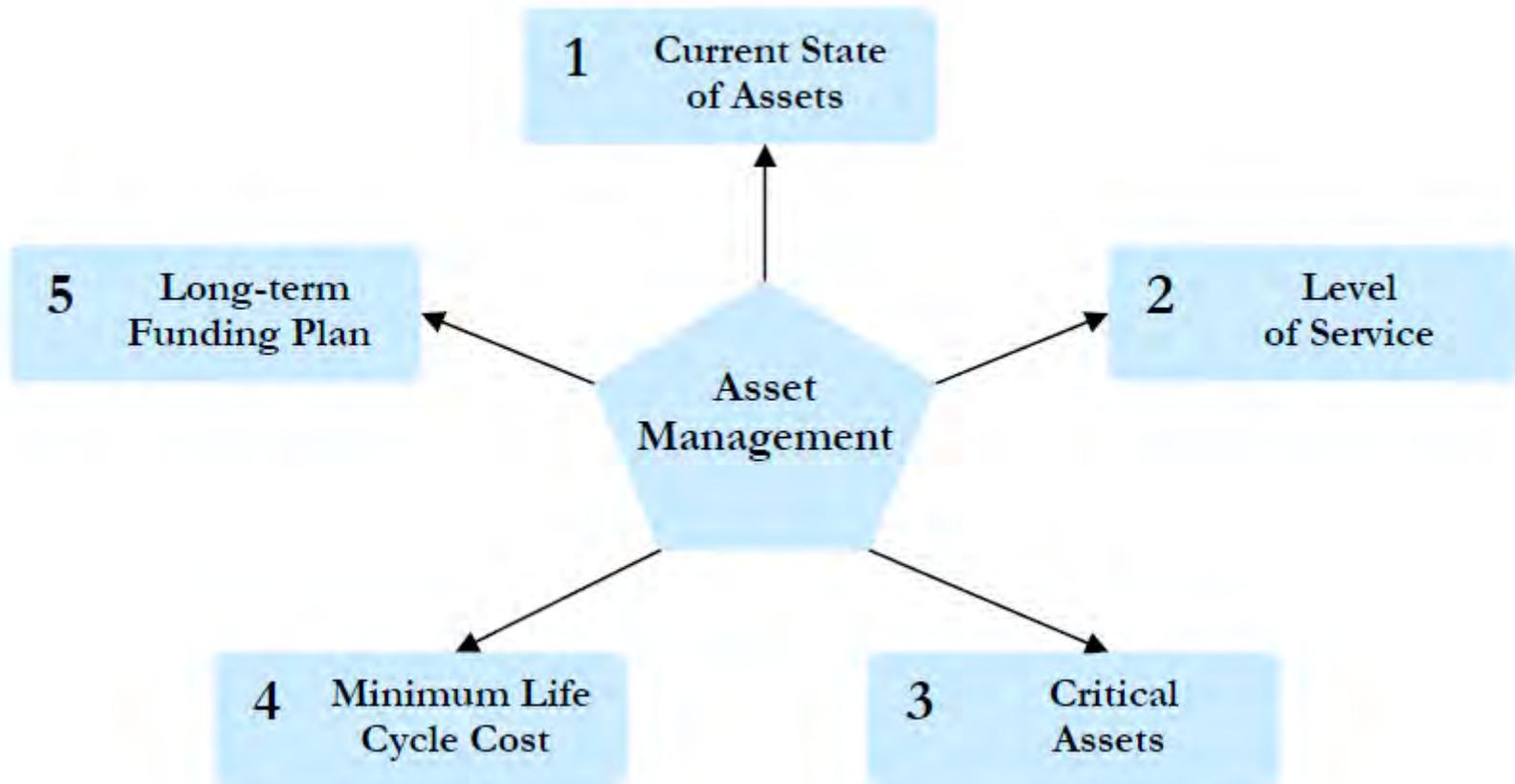
# How do you do Asset Management?



# ISO 55001



# EPA Framework



# Fundamental Principles of Asset Management

- What do you own?
- What kind of shape is it in?
- What are you going to do when it breaks?



# Start Small, But Start Now.

- You don't need a perfect system to see the benefits.
- Some Asset Management is better than no Asset Management.
- Start somewhere. (It's OK to start small)
- You will learn as you go.

## KAIZEN (continuous improvement)

- Start somewhere
- Make it a little better
- Repeat



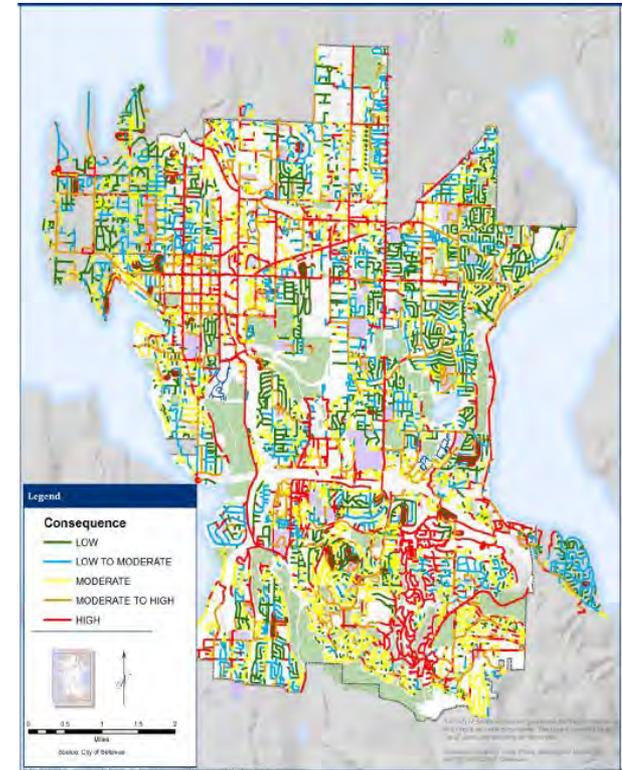


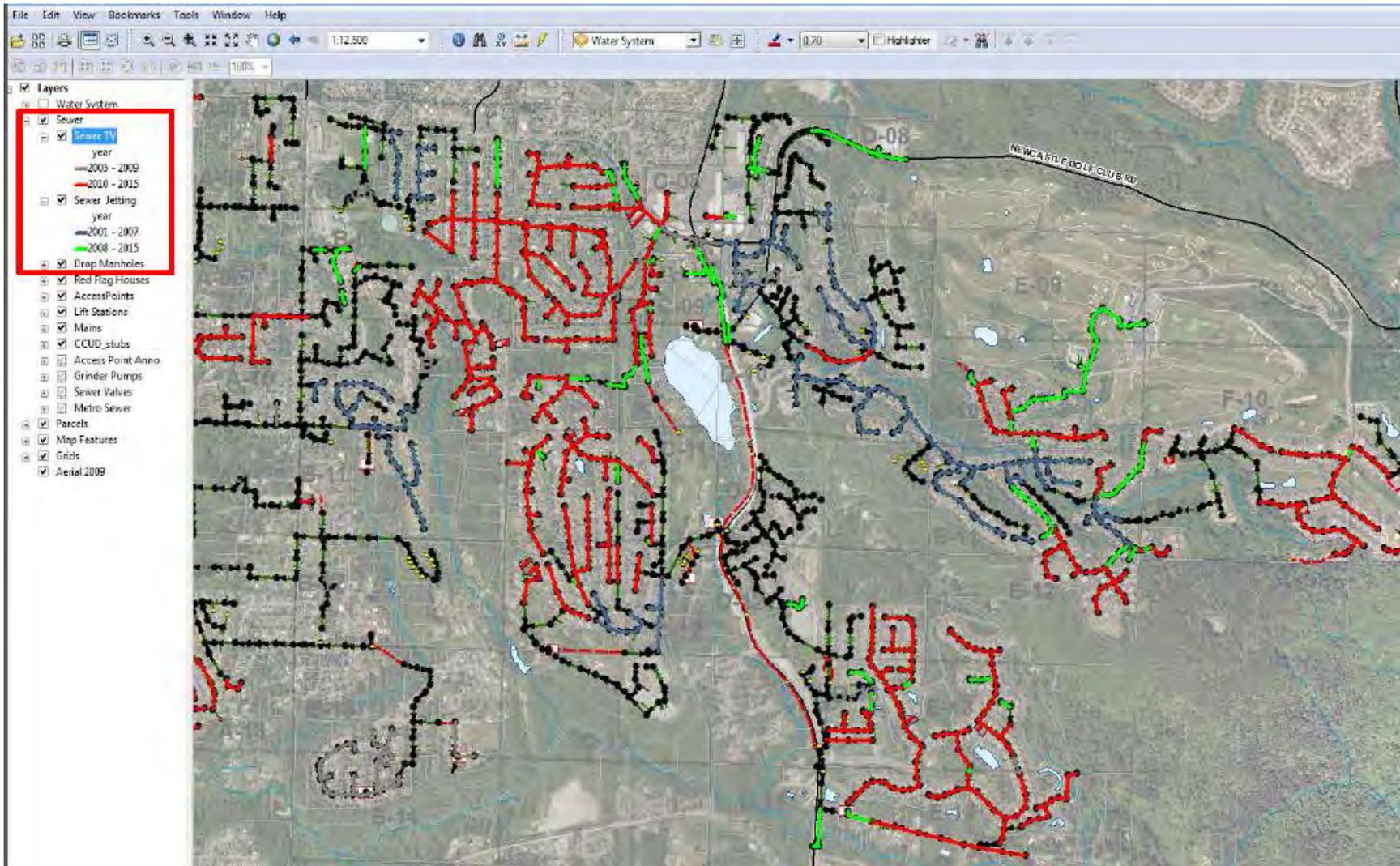
**IMPOSSIBLE**

# A Note About Software

# Isn't it exciting to be living in the future?

- The internet, GIS, and mobile networks have revolutionized Asset Management.
- Computerized Maintenance Management Software (CMMS)
- Web interfaces
- Field use of mobile devices
- Integrated GIS data layers





# Isn't there an app for that?

- Software can help schedule preventative maintenance
- Software can help locate (map) your assets
- Software can store condition rating data
- Software can retrieve the info easily.



# Problems with Software

- Acceptance by Staff
- How “Tech Savy” is your staff?
- Data/Server/Software incompatibilities
- Updates / Bug fixes
- Ability to grow with you / Ability to customize
- Too many bells and whistles? / Not enough features?



# Software is expensive

- Purchase \$\$
- Setup \$\$
- Training \$\$
- Annual Fees \$\$
- Hiring internal IT staff.



# “Will this software do what I need it to do?”

- I don't know.
- I don't even know what you need the software to do.
- Figure out what you need the software to do before you spend \$\$

Don't Start with software. Start by building your program.



**“A software package  
cannot solve a business  
process problem”**

# Use simple resources you already have

- Excel spreadsheet
- Digital photo's
- Inexpensive GPS device
- A smart phone
- Google Maps
- Google Earth aerial photos



# To Review:

## Simplified Asset Management

- What do you own?
- What kind of shape is it in?
- What are you going to do when it breaks?



# To Review:

## Simplified Asset Management

- an inventory of critical assets;
- an evaluation of the condition and performance of inventoried assets;
- a plan for maintaining, repairing, and, as necessary, replacing the critical assets and a plan for funding such activities;



# Asset Inventory



# You Can't Manage What You Can't See



# How do you track what you own?

An Asset Inventory takes many forms:

- “Wait, I own a sewer system?”
- “My senior operator knows where everything is buried.”
- Lots of “As Built” drawings in drawers and filing cabinets.
- Comprehensive (and reliably updated) map books.
- Computerized maps.
- Integrated, remotely accessible GIS maps linked to condition data, maintenance records, and our work order system.



# Starting from ZERO.

- Start with assets you can see
- Add in new projects as they are built
- Add underground assets whenever you have to dig.
- Start with only one asset class to learn and experiment.
- There is no “right way” to divide up your system into assets
- What you group and how you track your assets is your decision
- Start off with manageable chunks



# You know a lot more than you think you do

- Preventative Maintenance schedules
- Historical repair records
- Operator experience and knowledge
- “As built” Drawings
- Physically walk the system
- Manholes and Hydrants are above ground



# Condition Assessment



# Tools for Condition Assessment

- Visual Inspection
- Age
- Pipe Material
- Motor run time
- Failure Rates
- Maintenance History
  - Planned Maintenance
  - Unplanned Maintenance
- Televising Sewers
- Leak testing
- Pipe Wall Thickness
- Paint Thickness
- Oil consumption
- Oil contamination testing
- Thermal Imaging
- Laser/Sonar Testing
- Vibration monitoring



# In a *Perfect World* You Measure:

- All operational conditions for the asset,
- Any wear and the physical condition,
- Maintenance and repair histories,
- Current value of the asset,
- Replacement cost of the asset,
- All dependent systems and related assets,
- Complete risk assessment,
- For **ALL** the assets in **ALL** of your infrastructure systems.
- THEN you go insane, AND your field staff hate you.



# Focus on our Goal: Remaining Useful Life

- Only Collect data that supports your goal.
- Simple to explain and understand.
- Easy for field staff to collect.
- Don't collect worthless data.
- Broad assessments are OK.

Asset life depends on site conditions, how well it was installed, and how well it is maintained.



# For Example (Sewer Pipe)

- maintenance history,
- occurrence of overflows,
- Infiltration and Inflow,
- Pipe material,
- Pipe condition.
- Proximity to sensitive locations.



# What is the “end of life”?

- When it breaks?
- When duct tape and bailing wire won't hold it together anymore?
- When the cost of ongoing maintenance exceeds the cost of replacement?
- When growth in the system exceeds the asset's capacity?
- When the risk of catastrophic failure is too great?



# What is the “end of life”?

## When do you replace a light bulb?

- Wait for it to burn out. Go buy a new one.
- What if maintaining spares is difficult? (expensive, long life, many kinds of bulbs, or lots of bulbs)
- What if replacing the bulb is difficult and/or time consuming?
- What if replacing bulbs one at a time is inefficient?
- What if it starts flickering? (it still “works”, but is annoying)
- What if treatment depends on it? (UV bulb minimum output)



# POP QUIZ:

- Sludge pump #3 was installed 5 years ago.
- The manufacturer told you that pump has a useful life of 15 years.
- What is the remaining useful life of the pump?
  
- I don't know. BUT it is probably not 10 years.



# “End of Life” Depends on:

- Level of service
- Risk assessment
- Criticality
- Life Cycle costing
- Installation conditions and Maintenance practices
  
- Do NOT rely on “Estimated Useful Life” Tables!



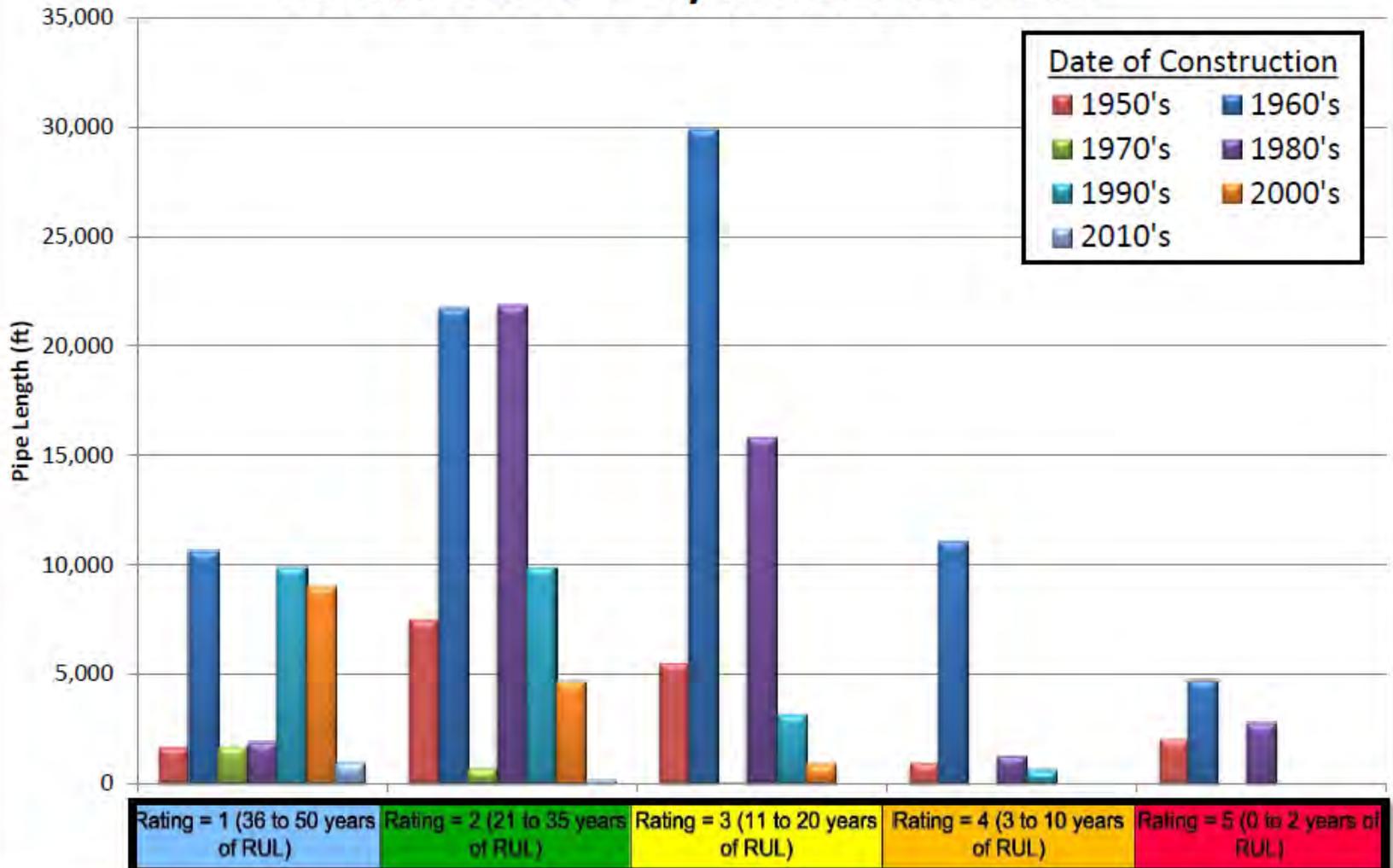
# For Example (Sewer Pipe)

## PACP grading system

- Grade 5 – Pipe segment has failed or will likely fail within the next five years - requires immediate attention.
- Grade 4 – Pipe segment has severe defects - risk of failure within the next five to ten years.
- Grade 3 – Pipe segment has moderate defects - deterioration may continue, at a ten to twenty year timeframe.
- Grade 2 – Pipe segment has minor defects - pipe unlikely to fail for at least 20 years.
- Grade 1 – Pipe segment has minor defects - failure unlikely in the foreseeable future.



## Condition Scores by Construction Date



# Plan For Replacement



# What is your plan for replacement?

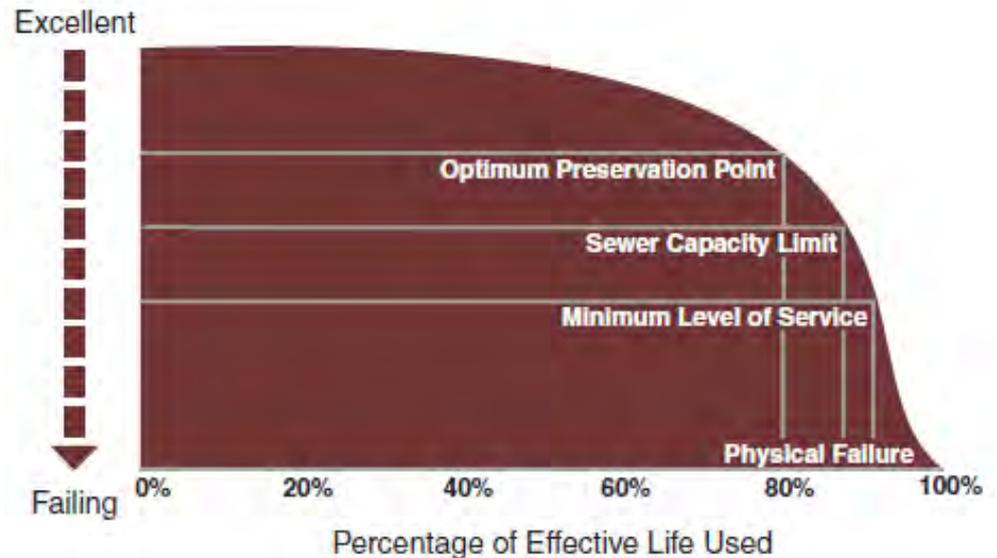
How does your utility plan for replacement right now?

- Panic
- Responsive Maintenance (Fix or replace assets as they fail)
- Preventative Maintenance
- Predictive Maintenance (Risk/consequences of failure)
- Proactive rehabilitation and replacement (Based on best professional judgment)
- Proactive rehabilitation and replacement (Using an evidence based system)



# What about maintenance?

- Maintenance is cheaper than rehabilitation
- Rehabilitation is cheaper than replacement.

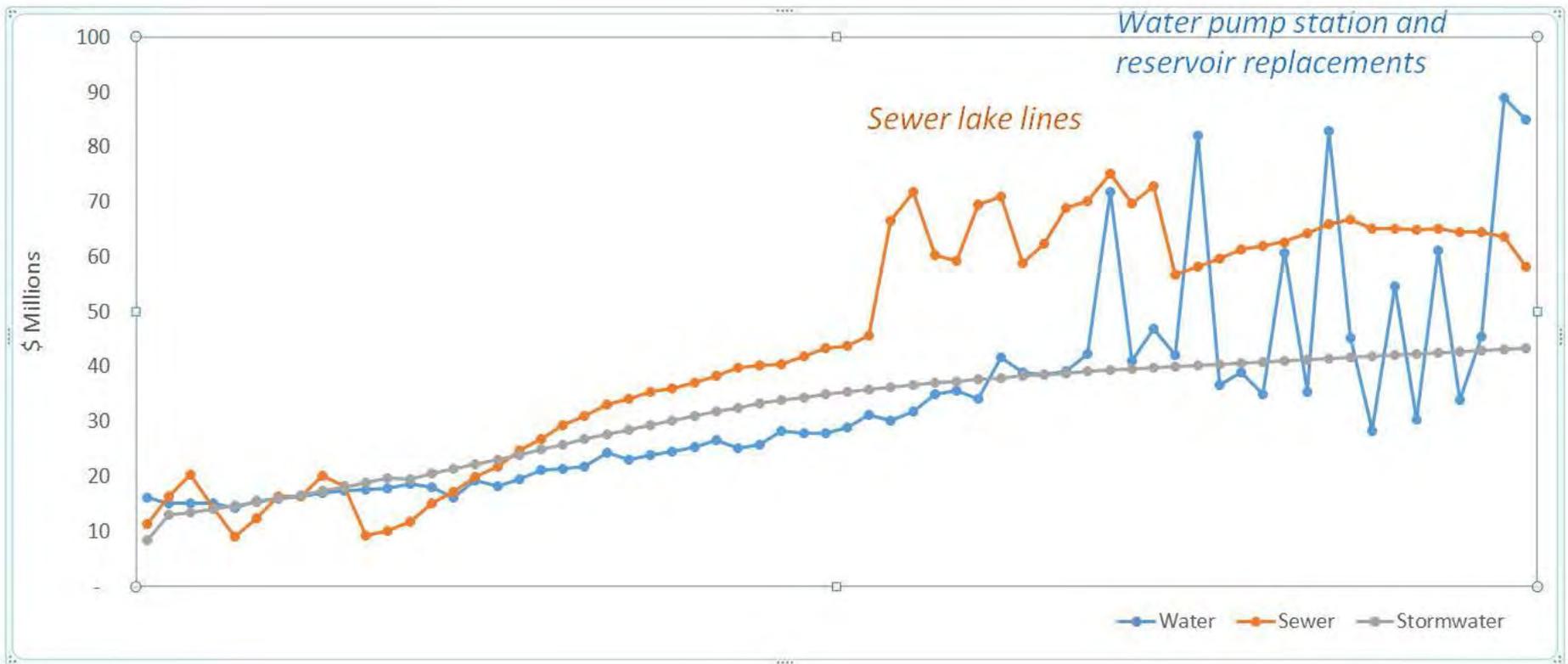


# LONG term planning (the 100 year CIP)

- Show All capital needs into far future
- Replacement and Rehabilitations of existing systems in realistic view
- Tool for managing debt or/and rate increases
- Recognize that you can't do everything now, but this is a tool to clearly show the effects of delaying work.
- Decision makers are not allowed to conveniently “forget” about future needs



# A version of a 75 year CIP



Values escalated to year of construction



# When do you decide to implement a project?

- Operational issues
- Cost of ongoing preventative maintenance
- The real cost of the improvements (or of NOT doing the improvements)
- Coordination with other work
- Coordination with other financial commitments
- Consider a true choice between replacement, repair and wait, and a larger overall project.





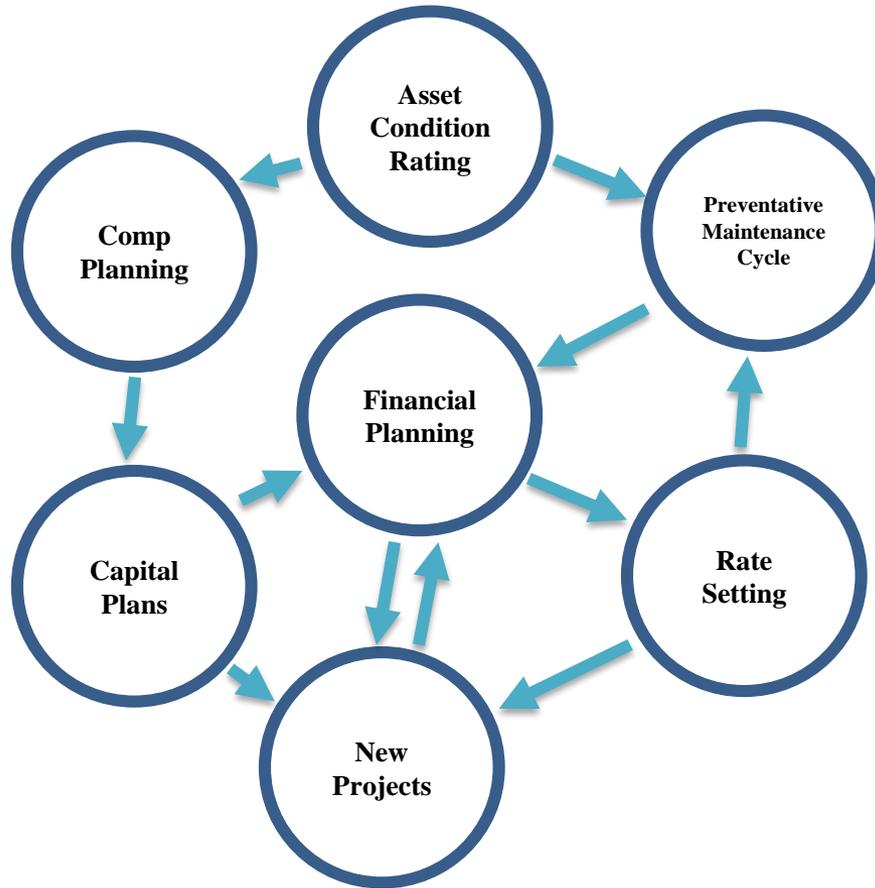
# A Culture of Asset Management

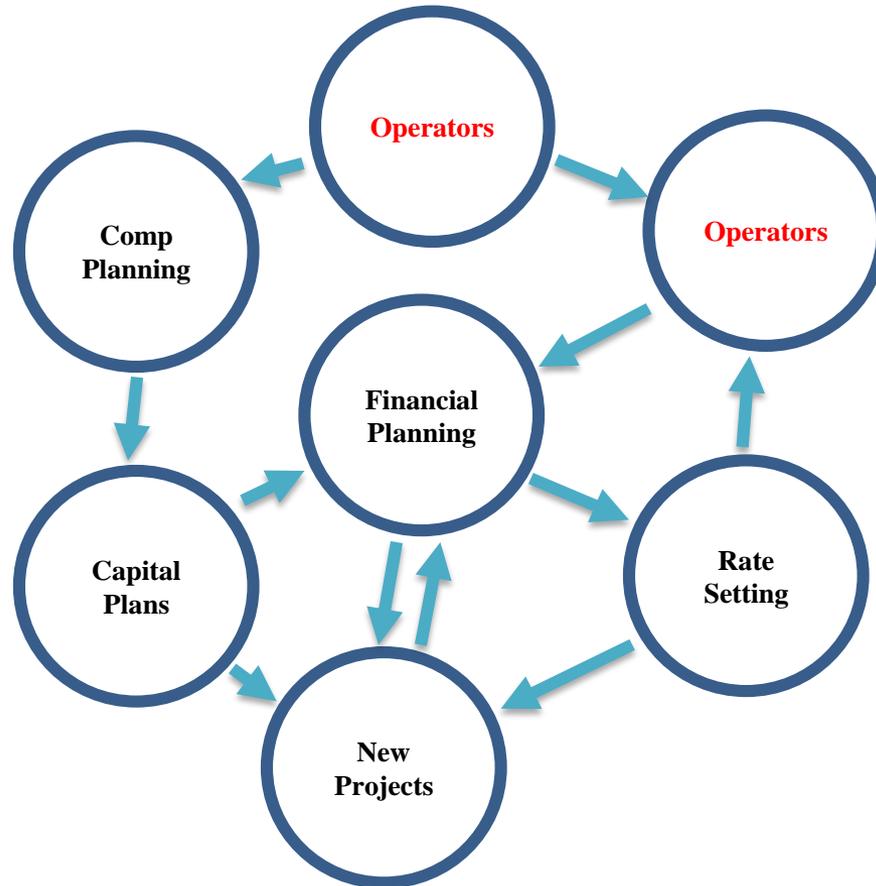


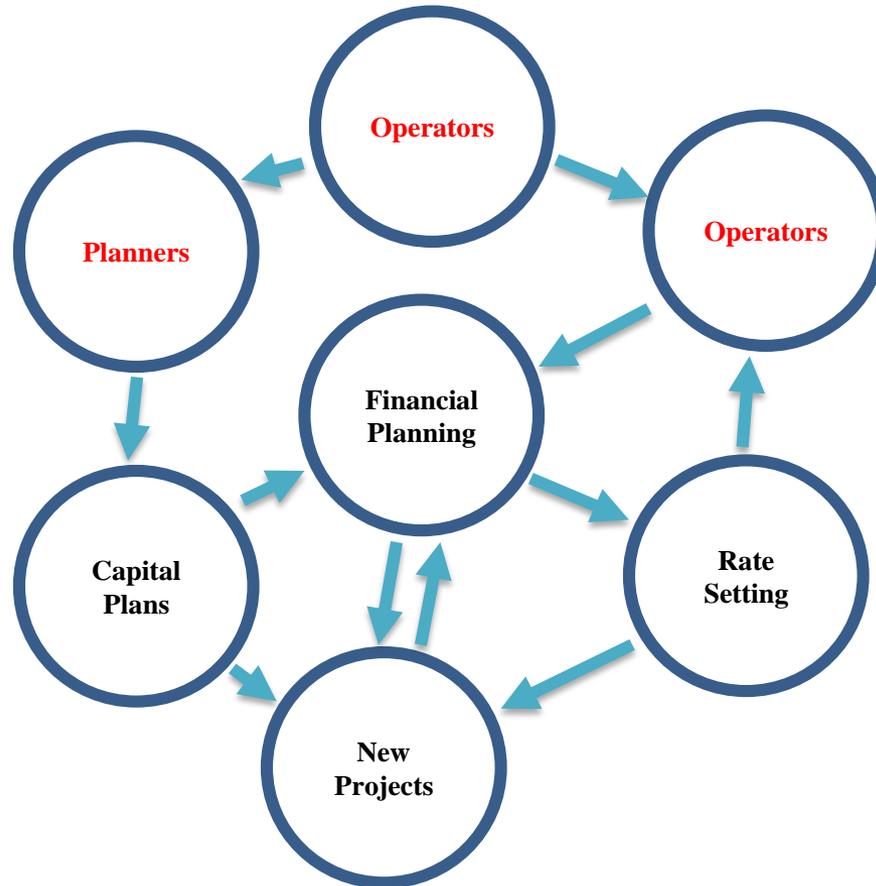
# Asset management is a team sport

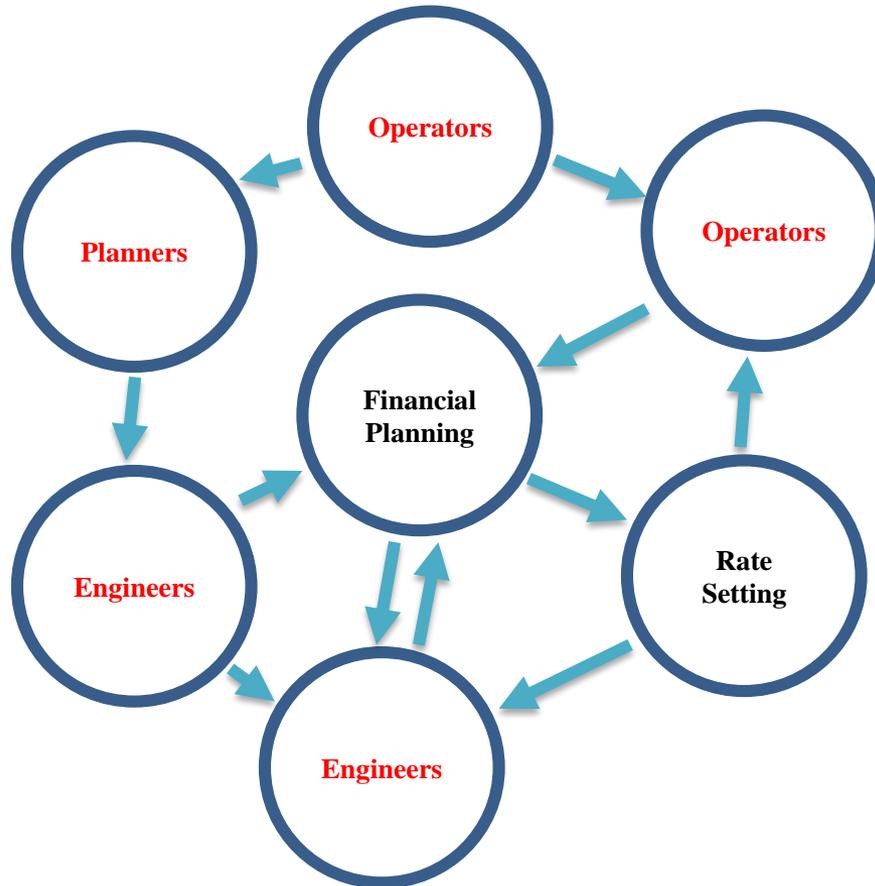
- Asset management is your utilities biggest single job.
- Everyone in your organization does asset management
- Asset Management is bigger than any one role in the system.

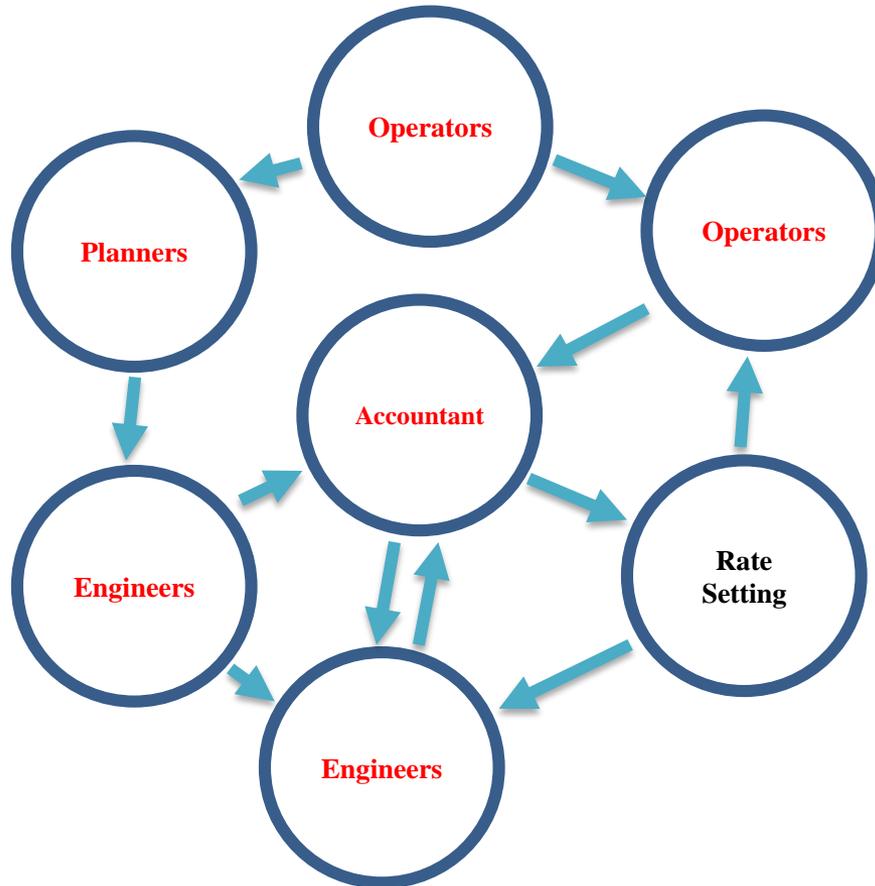


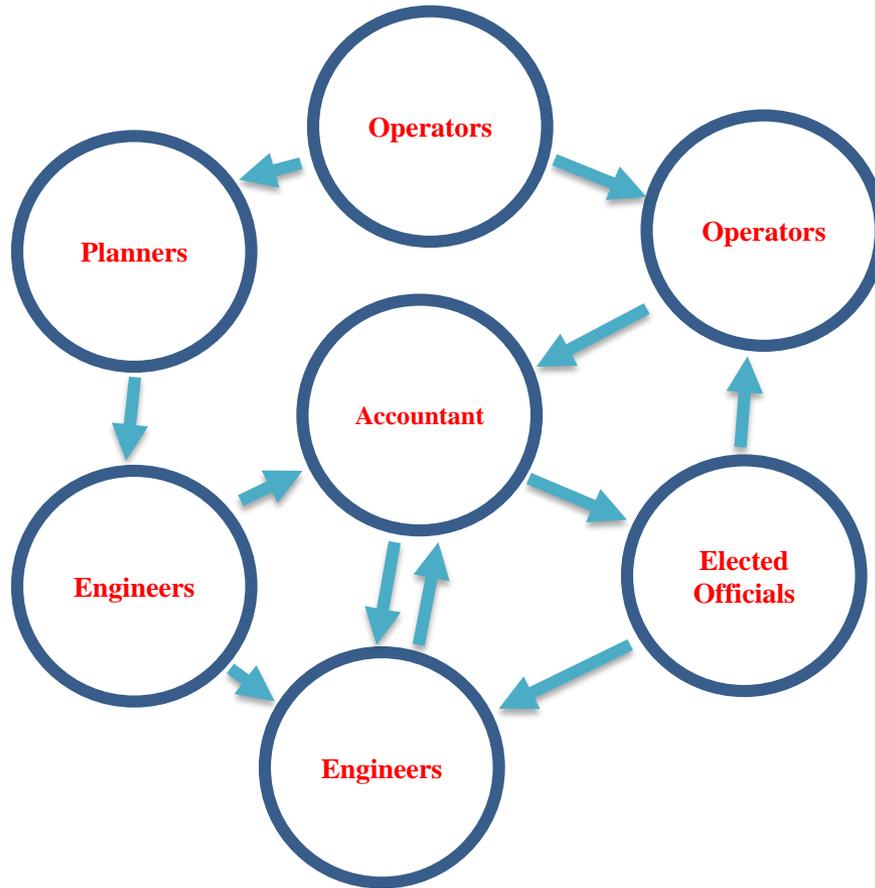












# Asset Management takes a cultural shift

- It takes a new way of thinking about the role of the utility
- New way of communicating
- New understanding about their jobs really are.
- This cultural change is a huge barrier



# Tips to overcome cultural inertia

- Appoint/nominate/draft an “AM lead”
- Make condition rating easy for field staff
- Use Condition rating to help field staff
- Involve everyone in project planning (finance, engineering, operators, IT, elected)
- Cross training and cross silo communication and understanding.
- Communicate with elected officials and the public
- Build a process to improve AM program



# Name an “Asset Management Lead”

- The “champion” for AM in your organization.
- Give them time, authority, and resources to do the job.
- Identify this person, add this to their job description.



# A successful asset management program convinces elected officials

- Evidence based justification for why projects are necessary
- AND why they should invest money
- AND why the projects will save money.



**“Society grows strong when old  
men plant trees in whose shade  
they will never sit.”  
– Greek proverb.**



**Commit to doing something to  
improve your asset  
management system over the  
next year.**



# Time for Questions?



# Contact Us!

- [David.Dunn@ecy.wa.gov](mailto:David.Dunn@ecy.wa.gov)
- 360/407-6503
  
- Water Quality funding program site:  
<http://www.ecy.wa.gov/programs/wq/funding/funding.html>
  
- Grant and Loan listserv:  
<http://www.ecy.wa.gov/maillist.html>

