An Introduction to Asset Management

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DEPARTMENT OF ECOLOGY
State of Washington

Department of Ecology

- Funding for Wastewater, Stormwater, Onsite Septic, and Non-Point
- ecy.wa.gov/programs/WQ/funding

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!

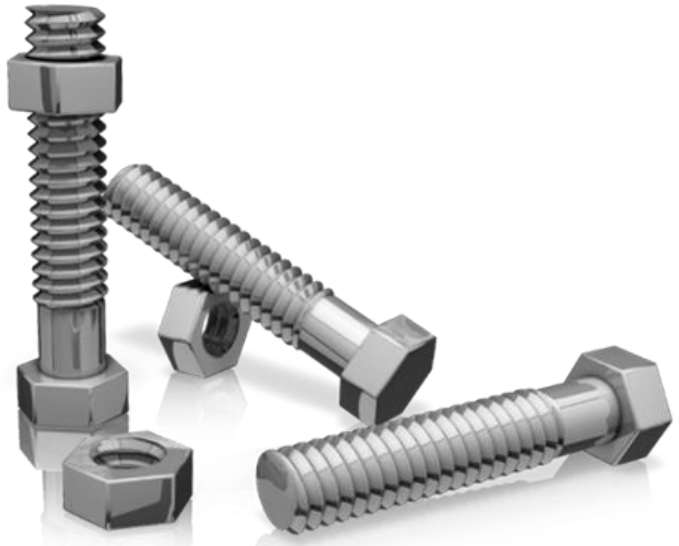
What is “Asset Management”

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
- Personel
- Intellectual Property
- Public Image

Why manage your assets?

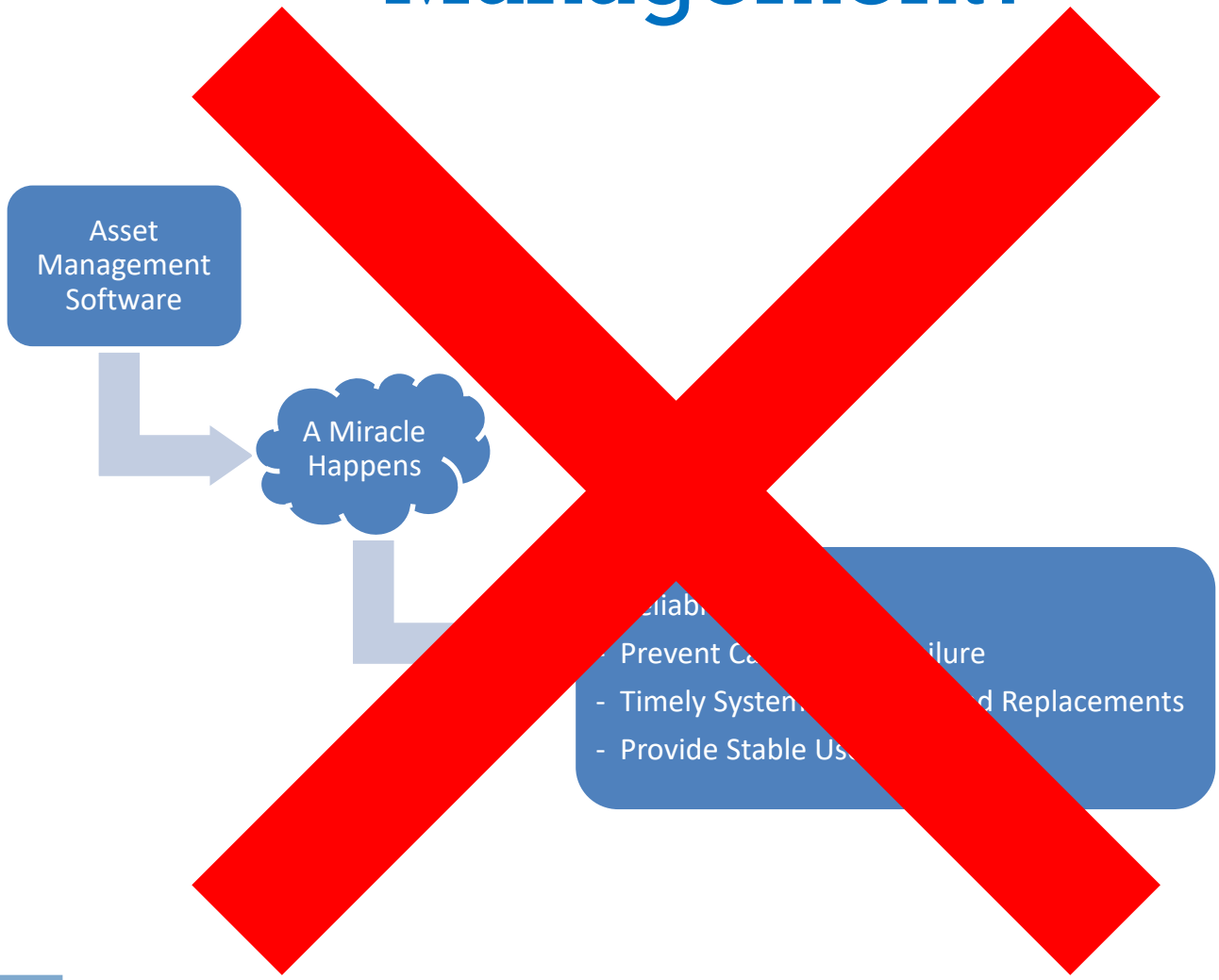
Asset Management - Multiple Benefits

- 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?



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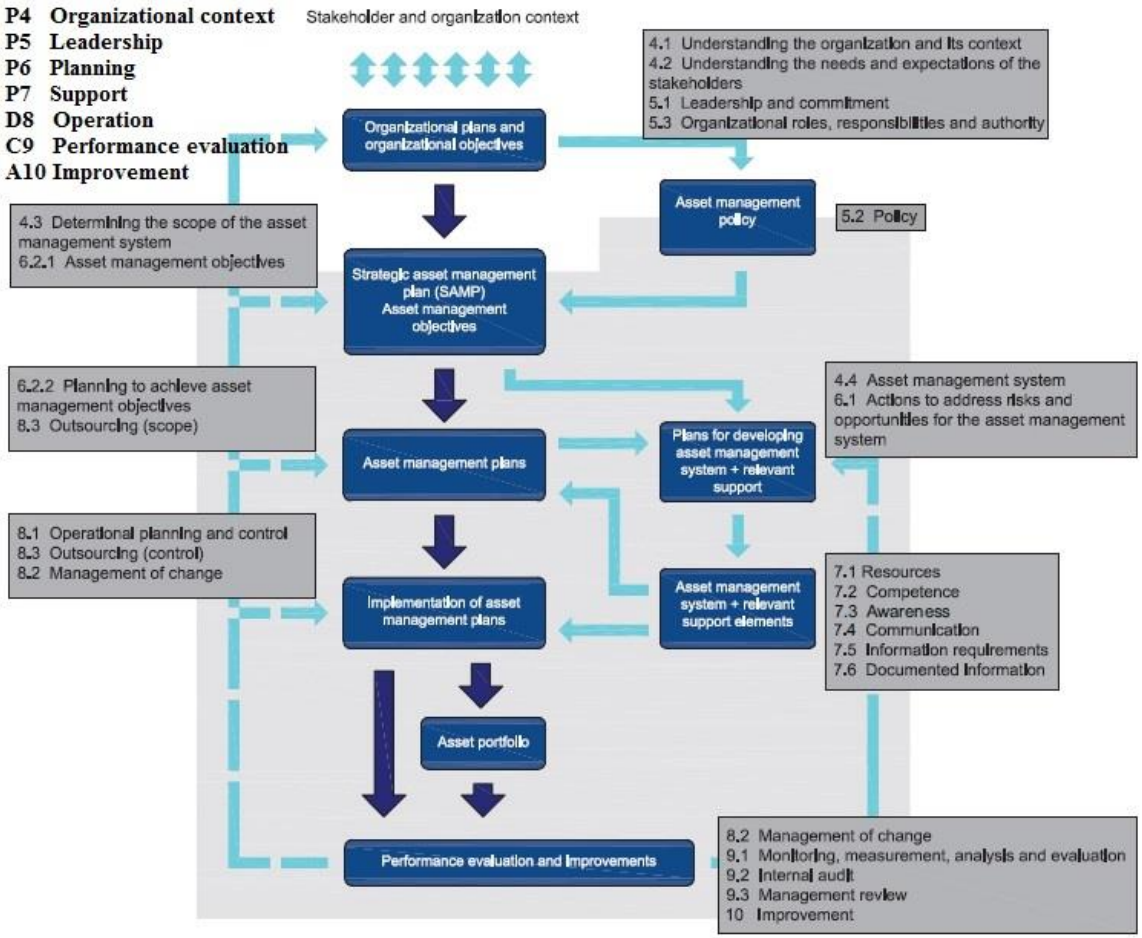
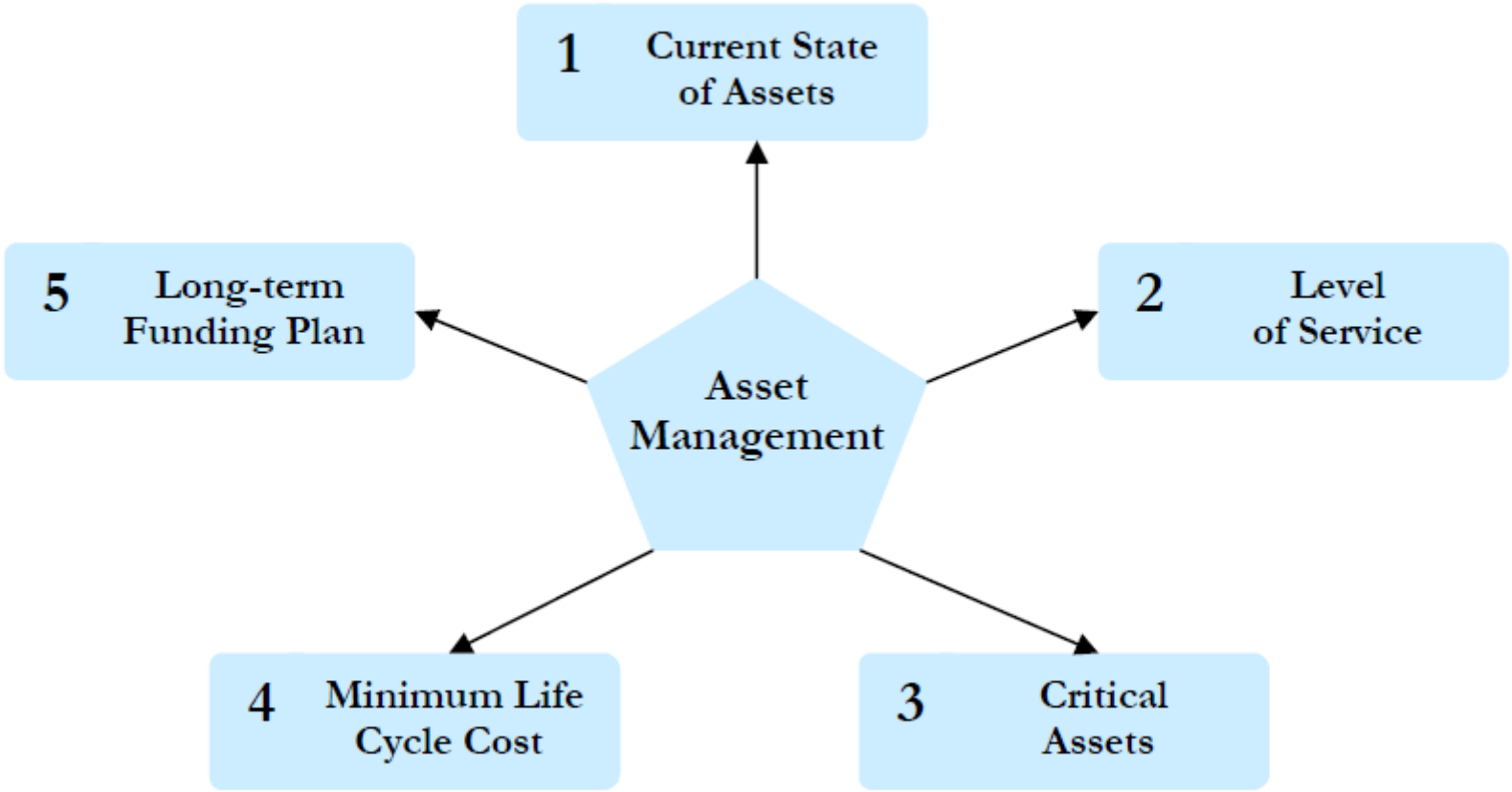

P4 Organizational context
P5 Leadership
P6 Planning
P7 Support
D8 Operation
C9 Performance evaluation
A10 Improvement
Stakeholder and organization context
4.1 Understanding the organization and its context
4.2 Understanding the needs and expectations of the stakeholders
5.1 Leadership and commitment
5.3 Organizational roles, responsibilities and authority
Organizational plans and organizational objectives
Asset management policy
5.2 Policy
4.3 Determining the scope of the asset management system
6.2.1 Asset management objectives
Strategic asset management plan (SAMP)
Asset management objectives
6.2.2 Planning to achieve asset management objectives
8.3 Outsourcing (scope)
4.4 Asset management system
6.1 Actions to address risks and opportunities for the asset management system
Asset management plans
Plans for developing asset management system + relevant support
8.1 Operational planning and control
8.3 Outsourcing (control)
8.2 Management of change
Implementation of asset management plans
Asset management system + relevant support elements
7.1 Resources
7.2 Competence
7.3 Awareness
7.4 Communication
7.5 Information requirements
7.6 Documented Information
Asset portfolio
Performance evaluation and Improvements
8.2 Management of change
9.1 Monitoring, measurement, analysis and evaluation
9.2 Internal audit
9.3 Management review
10 Improvement

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)

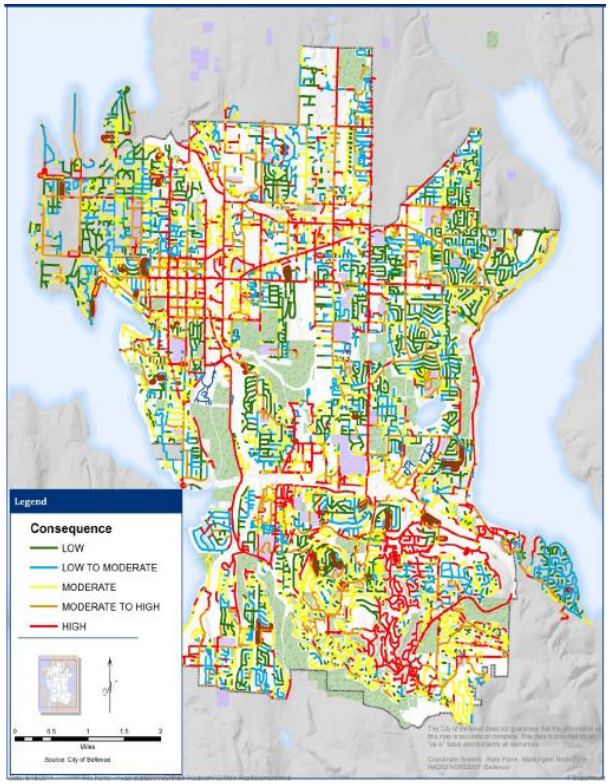
- Start somewhere
- Make it a little better
- Repeat

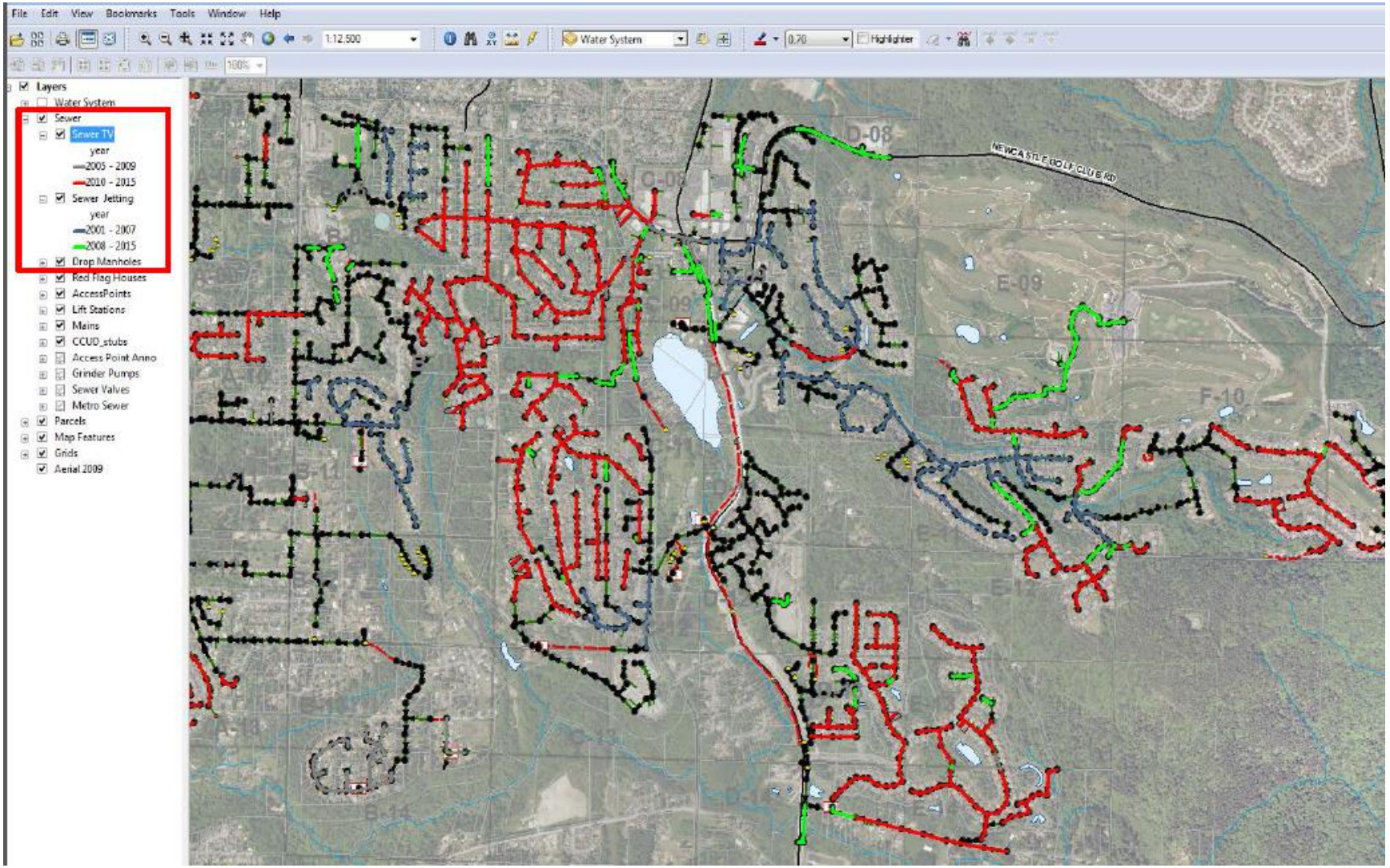

IMPOSSIBLE

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

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Sewer Jetting
year
2001 - 2007
2008 - 2015
Drop Manholes
Red Flag Houses
AccessPoints
Lift Stations
Mains
CCUD_stubs
Access Point Anno
Grinder Pumps
Sewer Valves
Metro Sewer
Parcels
Map Features
Grids
Aerial 2009
D-08
E-09
F-10
NEWCASTLE GOLF CLUB RD

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.

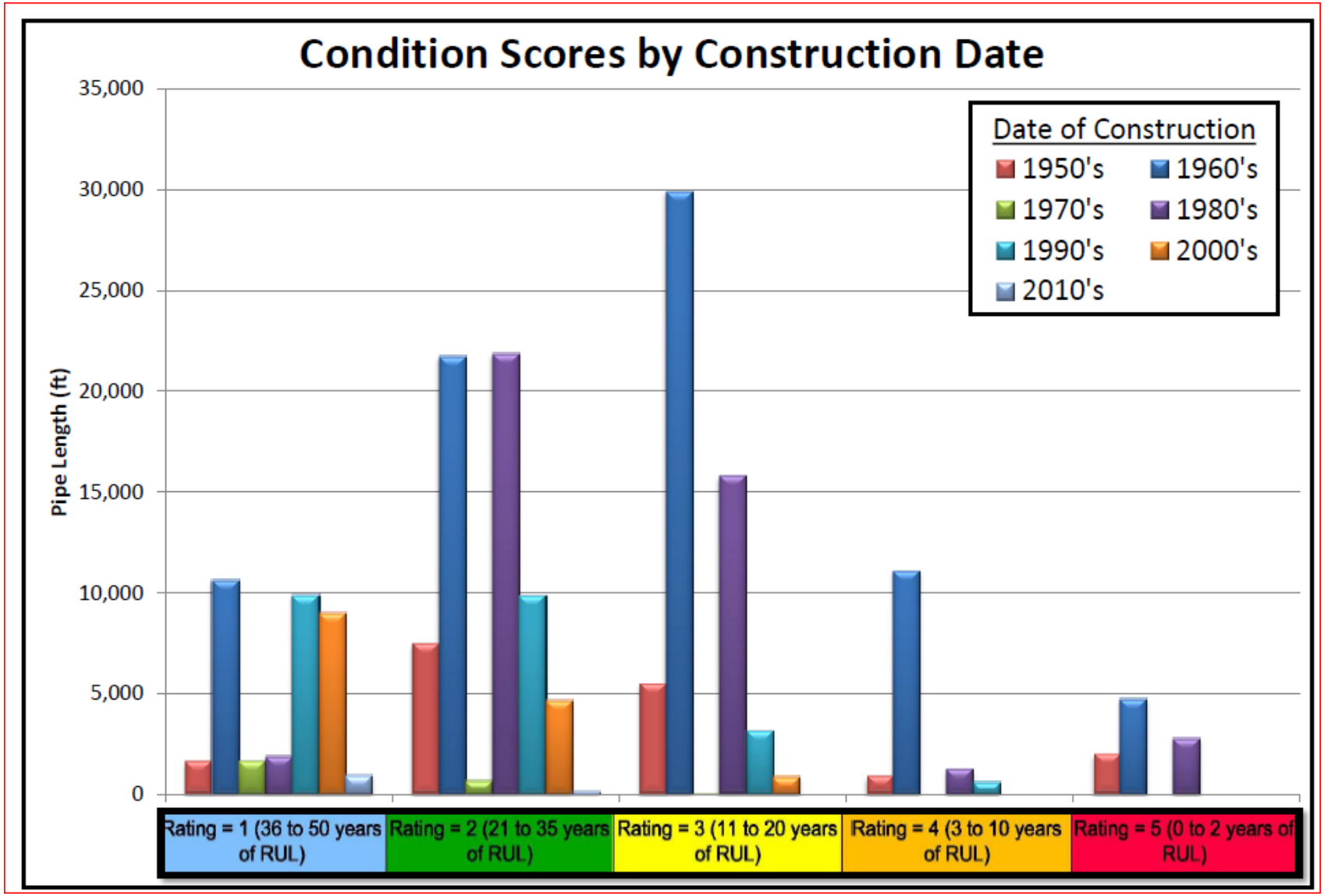
"End of Life" Depends on:

- 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
Pipe Length (ft)
35,000
30,000
25,000
20,000
15,000
10,000
5,000
0
Date of Construction
1950's
1960's
1970's
1980's
1990's
2000's
2010's
Rating = 1 (36 to 50 years of RUL)
Rating = 2 (21 to 35 years of RUL)
Rating = 3 (11 to 20 years of RUL)
Rating = 4 (3 to 10 years of RUL)
Rating = 5 (0 to 2 years of RUL)

Plan For Replacement

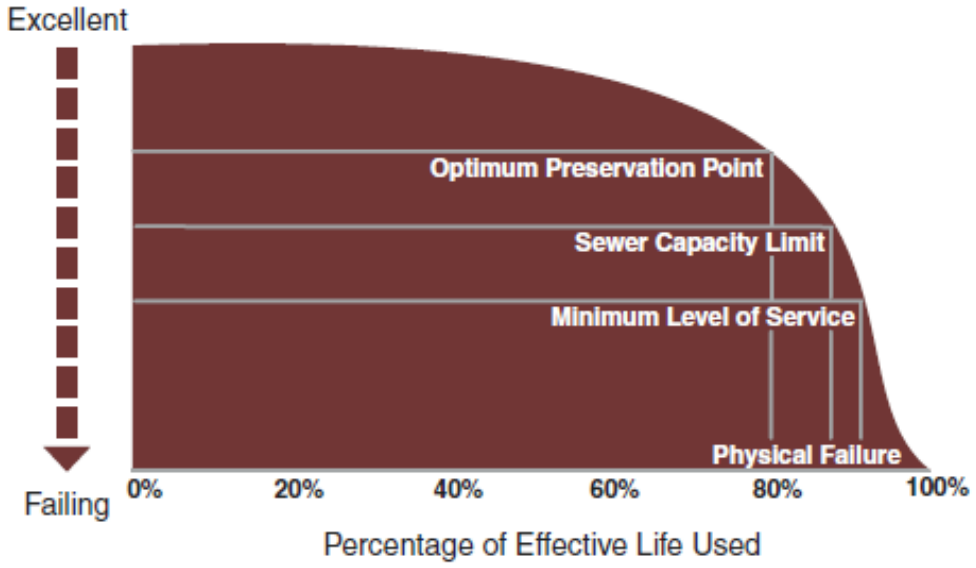
What is your plan for replacement?

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?

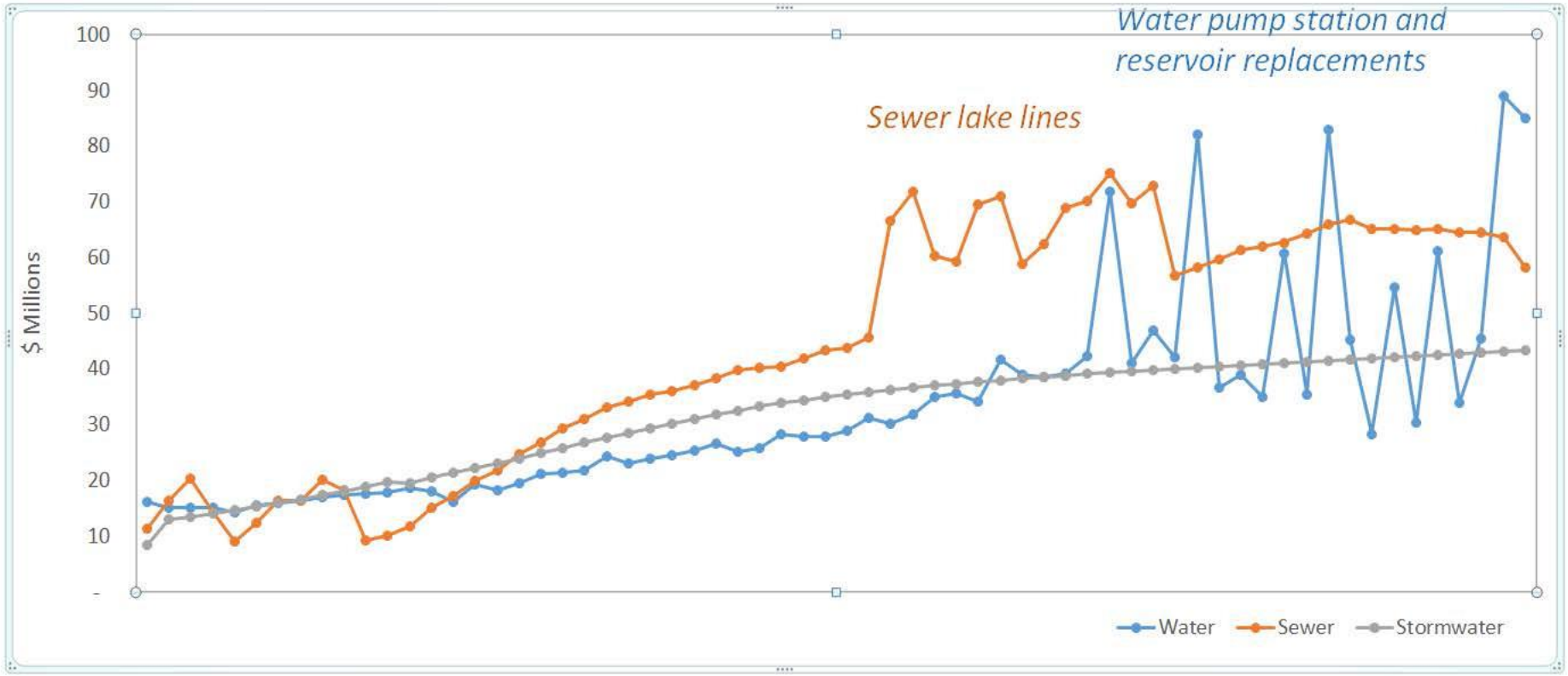
- Maintenance is cheaper than rehabilitation
- Rehabilitation is cheaper than replacement.



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 constructio

When do you decide to implement a project?

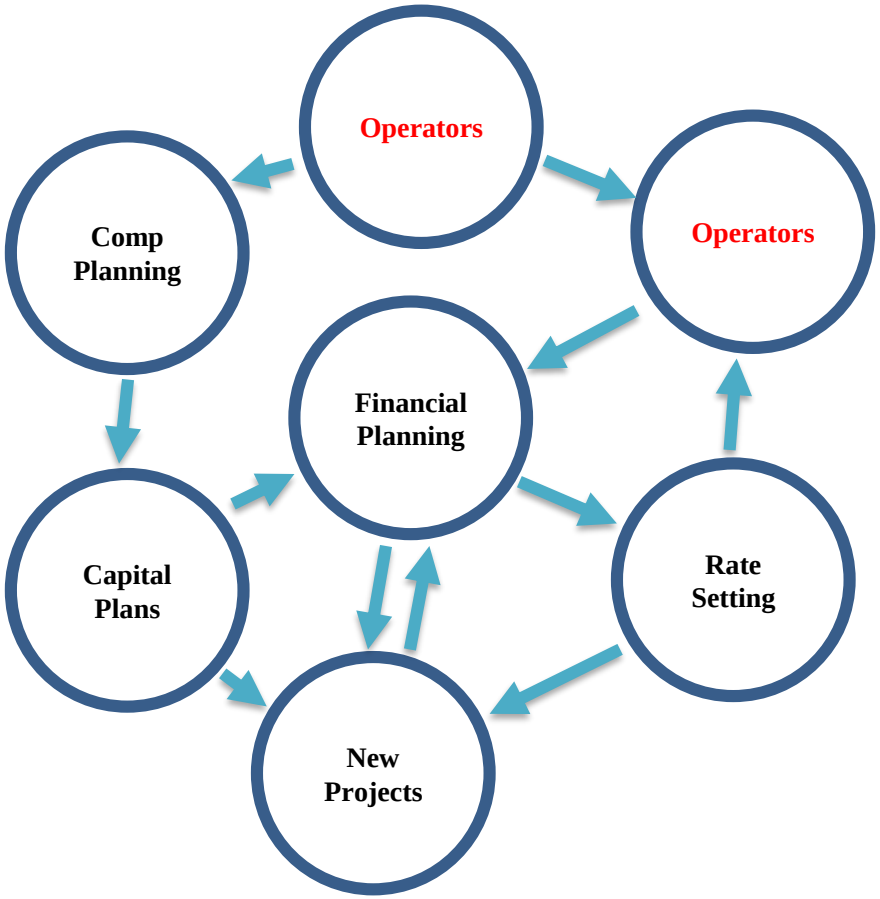
- Operational issues
- Cost of ongoing preventative maintenance
- The real cost of the improvements (or of NOT doing the improvements)
- Coordination with other work
- Coordination with other financial commitments
- Consider a true choice between replacement, repair and wait, and a larger overall project.

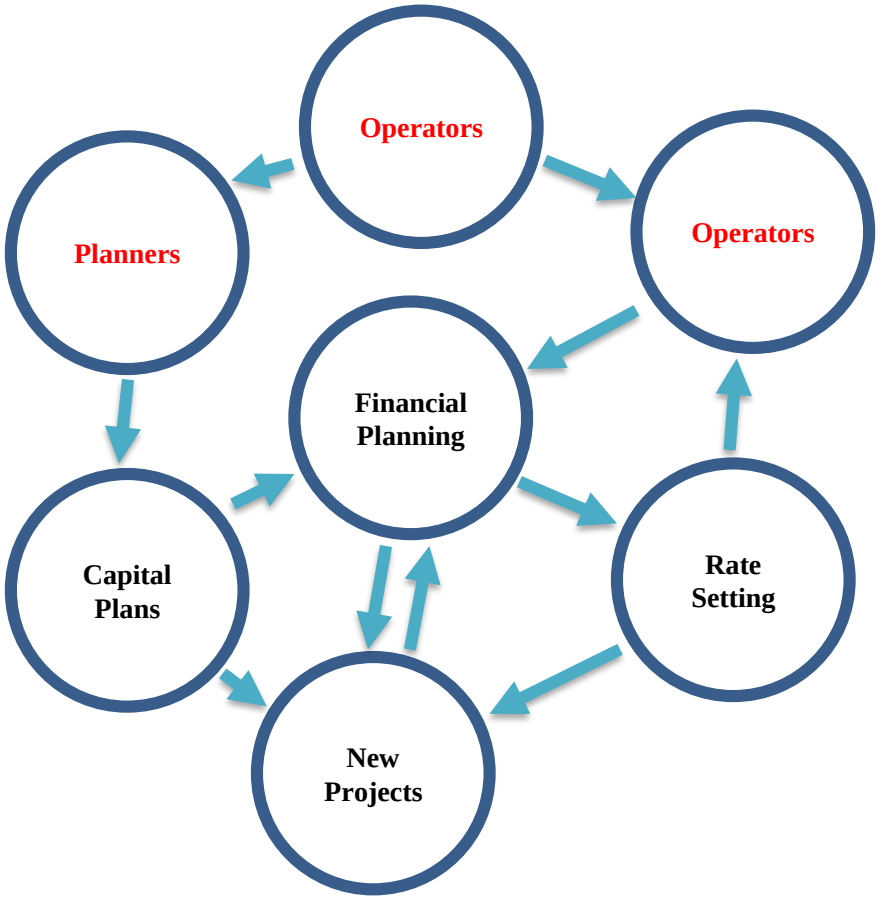
A Culture of Asset Management

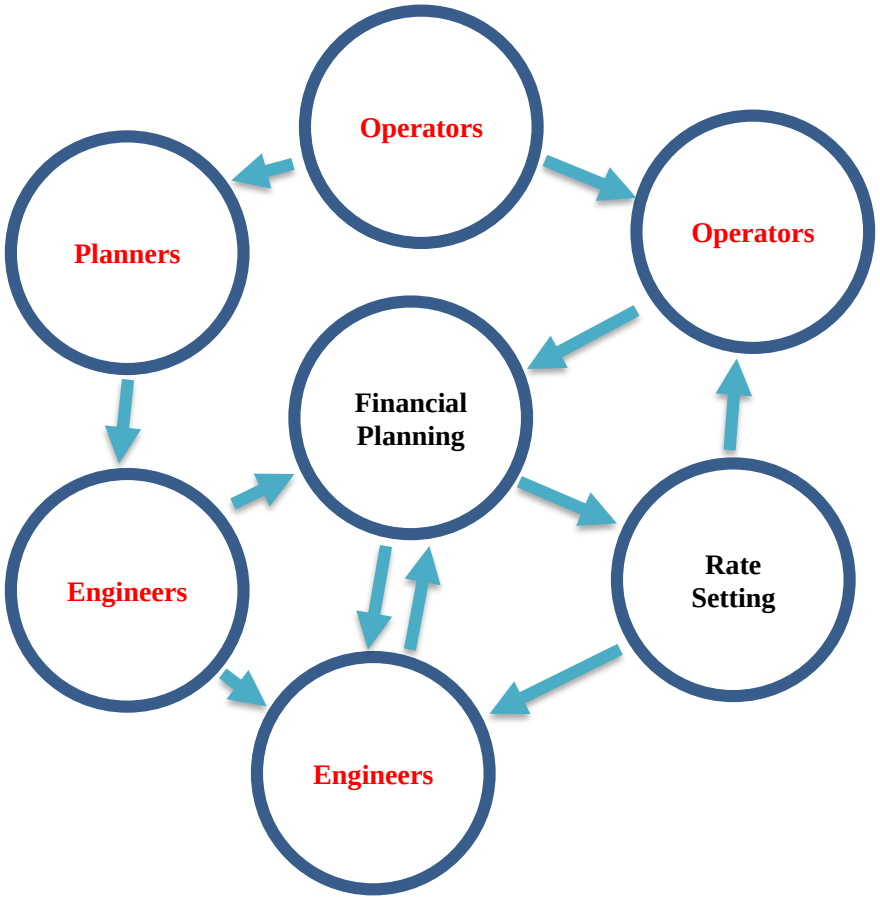
Asset management is a team sport

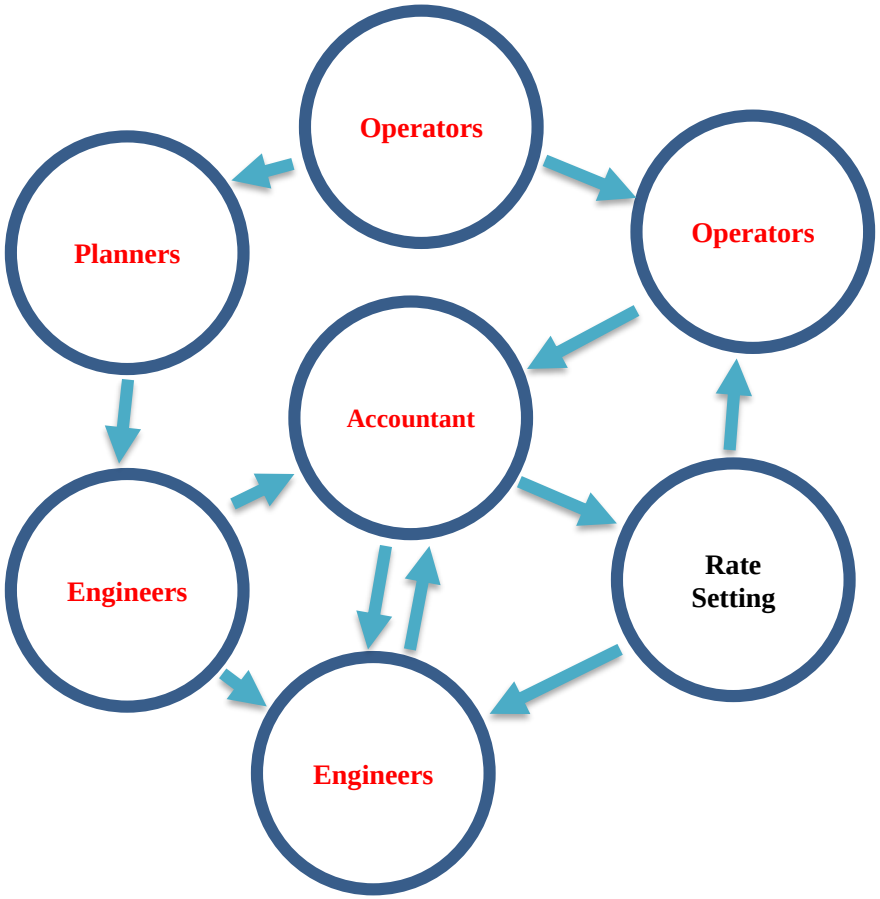
- Asset management is your utilities biggest single job.
- Everyone in your organization does asset management
- Asset Management is bigger than any one role in the system.

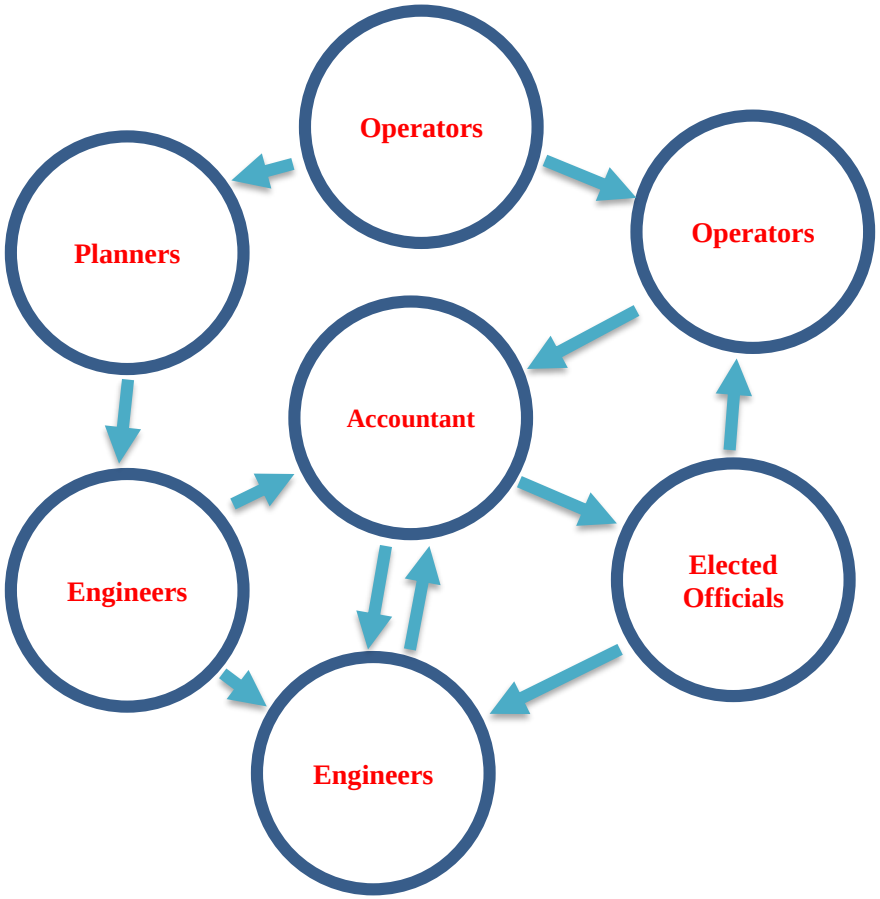

Asset Condition Rating
Preventative Maintenance Cycle
Comp Planning
Financial Planning
Capital Plans
Rate Setting
New Projects


Operators
Comp Planning
Operators
Financial Planning
Capital Plans
Rate Setting
New Projects


Operators
Planners
Operators
Financial Planning
Capital Plans
Rate Setting
New Projects


Operators
Planners
Operators
Financial Planning
Engineers
Rate Setting
Engineers


Operators
Planners
Operators
Accountant
Engineers
Rate
Setting
Engineers


Operators
Planners
Operators
Accountant
Engineers
Elected Officials
Engineers

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.

- Q

Time for Questions?

Contact Us!

- 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