Overview of Asset Management for Public Water Utilities

Funding for this project was provided from the Local Governments and Rural Water Systems Improvement Board. MWPCOA thanks the LGRWSI Board for their continued support of the project.

Mississippi State Department of Health

Special thanks to the following for assisting in obtaining data for the case studies and reviewing the contents of this curriculum

- Stanley Spradling, P.E. – Neal-Schaeffer
- Galen Shumaker
- Mary Jane Coign
- Pam Lee
- Kalyn Coatney

MISSISSIPPI Water and Pollution Control Operators Association

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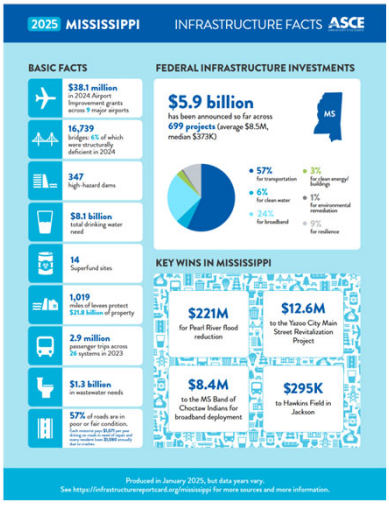
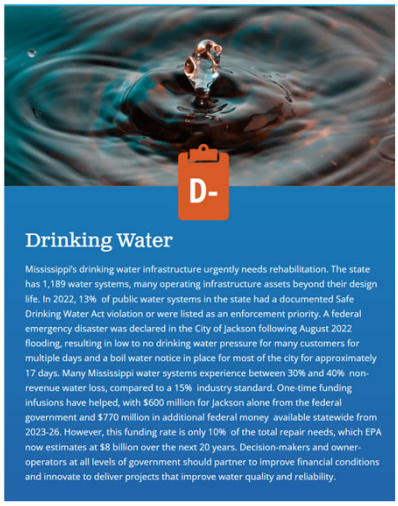
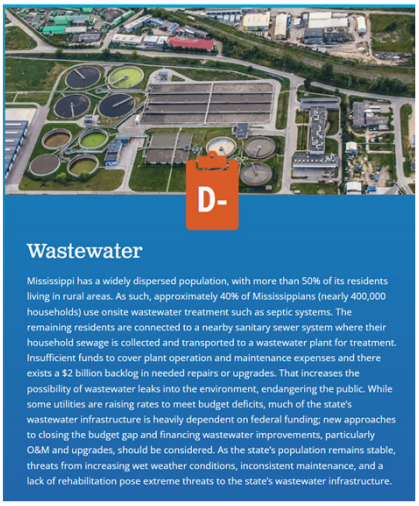
Why worry about asset management?







https://infrastructurereportcard.org/state-item/mississippi/

2

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We're all familiar with these news stories

Clarion Ledger

Sports Business Entertainment Opinion Advertise Obituaries eNewspaper Legals

NEWS

Trillions of gallons leak from aging drinking water systems, further stressing shrinking US cities

Tammy Webber Associated Press
March 15, 2024, 6:00 p.m. CT

https://www.clarionledger.com/story/news/2024/03/15/water-systems-leaking-trillions-of-gallons-in-shrinking-us-cities/72975384007/

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LOCAL

Henifin now in charge of fixing Jackson sewer system. See how many sewage overflows city has

Charlie Drape
Mississippi Clarion-Ledger
Oct. 2, 2023 | Updated Oct. 3, 2023, 5:43 p.m. CT

https://www.clarionledger.com/story/news/local/2023/10/02/ted-henifin-is-officially-in-charge-of-fixing-jacksons-sewer-system-when-will-they-collect-bills-ms/71030745007/

Clarion Ledger

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NEWS

Mayor update south Jackson residents on water system woes. Help is on the way

Ed Inman Special to the Mississippi Clarion Ledger
Feb. 2, 2023, 8:45 a.m. CT

https://www.clarionledger.com/story/news/2023/02/02/jackson-ms-mayor-chokwe-lumumba-updates-residents-on-water-syste/69865791007/

Clarion Ledger

Sports Business Entertainment Opinion Advertise Obituaries eNewspaper Legals

LOCAL

JXN Water customers face potential rate increase as federal funds run out

Pam Dankins
Mississippi Clarion Ledger
March 17, 2025, 4:06 a.m. CT

Key Points AI-assisted summary

- JXN Water, facing a financial deficit, may increase water rates by nearly 25% by summer 2025.
- The proposed rate hike aims to address dwindling federal funds and rising operational costs.
- If approved, the average residential customer's bill would increase by about $9 per month.

https://www.clarionledger.com/story/news/local/2025/03/17/jackson-ms-water-rates-could-rise-as-federal-funds-run-out/82234713007/

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But what about these?

ENVIRONMENT

'Trainwreck on the horizon': The costly pains of Mississippi's small water and sewer systems

by Alex Rozier
April 21, 2025

https://mississippitoday.org/2025/04/21/trainwreck-on-the-horizon-the-costly-pains-of-mississippis-small-water-and-sewer-systems/

FRAGMENTED & FAILING: MISSISSIPPI'S UTILITY SYSTEMS

Customers of some of the state's worst water and sewer systems are seeing 'astronomic' rate hikes

by Alex Rozier
April 24, 2025

https://mississippitoday.org/2025/04/24/customers-of-some-of-the-states-worst-water-and-sewer-systems-are-seeing-astronomic-rate-hikes/

MISSISSIPPI TODAY IDEAS

Ted Henifin: I will be the bad guy if it is better for Jackson water

by Ted Henifin
April 25, 2025

https://mississippitoday.org/2025/04/25/ted-henifin-i-will-be-the-bad-guy-if-it-means-better-for-jackson-water/

One water association with just 829 customers – [redacted], in [redacted] – had 83 violations in just the last 5 years, including exceeding arsenic limits in 2023. Several other small water systems (such as the [redacted] in [redacted], or [redacted]) are considered "serious violators" by the EPA for, in part, not meeting limits on disinfectant byproducts that were set in 2006. Of the state's 19 "serious violators," more than half serve 1,200 or fewer people. The EPA defines a small water system as serving 3,300 people or fewer.

The reality, some experts believe, is that some customers of small utilities around the country are facing a seismic shift in the cost of their basic services, whether it happens now or later. Not only have many of these systems not accounted for the true financial needs of their infrastructure, but they also lack economies of scale. And for many small private systems, which don't have the same access to government grants as public utilities, raising rates is the only way to make the difference.

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But what about these?

Western KY nurse advocates zero contaminants in public drinking water

https://www.facebook.com/share/v/16AJdjUQjH/?mibextid=wwXIfr

https://www.facebook.com/share/v/18wzHKATwQ/?mibextid=wwXIfr

https://mwpcoa.org/wp-content/uploads/2025/04/City-Council-Meeting-Megan-Kirk.pdf

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Which situation will your system end up in?

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Where are we going?

Mississippi is experimenting with consolidating management for some of its small, privately owned water and sewer systems. In 2021, a company called Great River began buying struggling systems around the state. A subsidiary of the national firm Central States Water Resources, the company focuses on struggling, poorly financed systems that most large utility firms wouldn't touch. Now operating in 11 states, the company has access to more resources than what a small operator would, and can reduce overall costs by spreading them out throughout its service area.

In Mississippi, part of the PSC's job is to make sure private utilities that have a monopoly over a given service area, like Great River, only charge customers for what their services are worth, plus enough profit to stay in business. Given the challenges of some small systems in the state, the PSC welcomed the company's help. But Great River, as is common when a large private utility takes over, quickly imposed steep rate increases to fund its repairs.

As Great River's ratepayers plead with the PSC to soften the financial blow, the condition of some Mississippi water and sewer providers suggest those basic services will have to cost much more than they used to, especially for customers of small systems.

Part two of this story will further explore the Great River's impact on ratepayers, and what the future holds for small water and sewer systems struggling to stay afloat.

https://mississippitoday.org/2025/04/21/trainwreck-on-the-horizon-the-costly-pains-of-mississippis-small-water-and-sewer-systems/

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What is an asset management plan?

- The asset management plan is an umbrella plan for other issues that the utility has had to address over the past decades
  - Long range plan
  - Security vulnerability assessment
  - Risk and resiliency plan
  - Rate adjustment plan (have you had a rate study performed lately?)
- But the asset management plan is more than just assembling these plans into a binder
  - System administration (operator, manager, and governing board) ***must*** develop strategies to make the system sustainable
  - This requires a commitment of resources – mainly ***time***
  - The result is a set of strategies that address system sustainability – mitigating the failure of system components

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What is risk?

- Potential that an action (or inaction) will lead to loss or another "bad" outcome
- There exists a choice to have an influence on the outcome
- All endeavors carry risk; some are more risky than others

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Types of risk

- **External Risk –** Risk that cannot be controlled by system operations
  - Interest rates, natural disasters (hurricane, flood or earthquake)
- Internal Risk – Risk that occurs within system operations. These can be forecast and mitigated
  - Worn equipment, faulty infrastructure, outdated software, outdated production practices

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Managing risk

- Identify internal risks
- Analyze risk
- Prioritize risk mitigation
- Respond to situations where risk is present (the basis of Asset Management)

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ALLEVIATING (MITIGATING) RISK THROUGH ASSET MANAGEMENT

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Why discuss asset management?

- The American Society of Civil Engineers (2024) estimates that the following water/wastewater funds will be needed within the next 20 years:
  - Water: $8.0 billion in infrastructure needs
  - Wastewater: Mississippi is facing a $1.5 billion shortfall; Mississippi needs $2.0 billion in wastewater infrastructure needs

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For the long run…

- Develop a true long range plan complete with goals and strategies
  - Don't view this as following the "letter of the law" in the annual capacity assessment
- Requires communication ***and collaboration*** between the board and the operator
- Develop an asset management plan that fits into your long range strategic plan
- Obtain realistic prices for capital improvements

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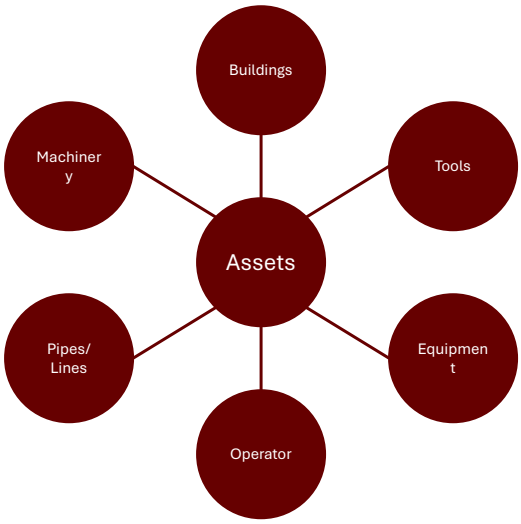
What are assets?



Tangibles that are used in the operation of a drinking water or wastewater utility

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Asset truths

- All assets are not created equally
- All manmade assets eventually fail
- Failures directly affect system performance; failures constrained by costs
- Investment should be guided by the likelihood and consequence of failure

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Asset management might be broken into two components

- Distribution/Collection
  - Evaluating, repairing & maintaining pipes, valves, hydrants, pumping facilities, etc.
  - Managing meters
  - Pressure management to prolong system life
- Treatment
  - Maintaining chemical, water and supply structures
  - Building new structures and adopting more efficient and effective treatment methods
  - Implementing security measures

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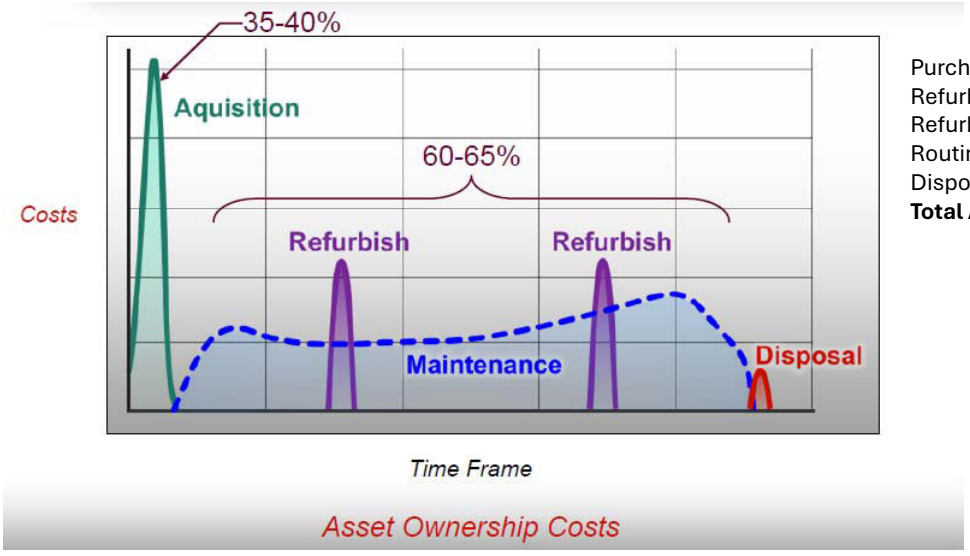
But why?



Purchase Price:	$40,000
Refurbish 1:	$15,000
Refurbish 2:	$15,000
Routine Maintenance:	$26,000
Disposal:	$4,000
Total Asset Cost:	**$100,000**

Source: Steve Allbee, US Environmental Protection Agency

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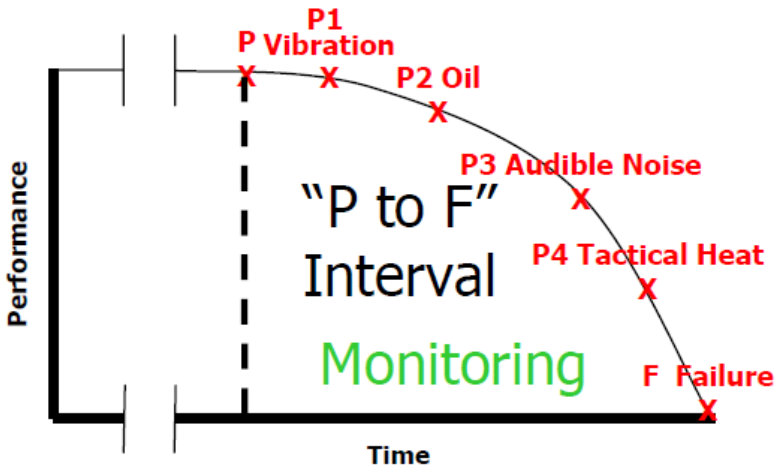
This is what we're trying to define
Performance to Failure Interval



Source: UNC Environmental Finance Center
https://efcnetwork.org/wp-content/uploads/2014/10/4-Capital-Planning-for-Local-Government-NC-Dec2014.pdf

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Asset management definition

Definition of asset management:

- A ***planning process*** that ensures that you get the most value from each of your assets and have the financial resources to replace them when required
- Includes developing a plan to reduce costs by/while increasing the efficiency and reliability of assets

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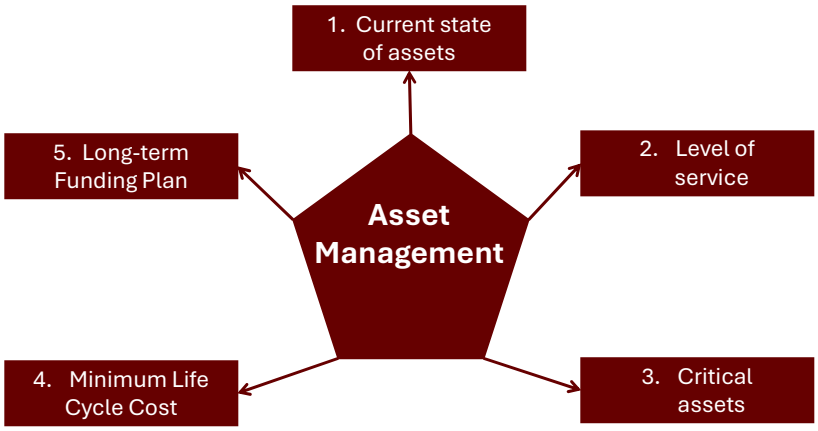
Asset management framework



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Asset management framework

- Failure Modes
  - Mortality
  - Efficiency
  - Capacity
  - Length of Svc

Failure means a physical asset has lost its function

Characteristics of each mode include:

- **Definition**
- **Tactical Aspect**
- **Management Strategy**

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Current state of assets

- Compile inventory (list) of assets
- Determine asset age – often obtained from accounting records
- Estimate useful asset life – low risk of failure
  - Not obtained from depreciation tables
  - Obtained from practical experience, system to system networking and engineering expertise
- Must be able to identify the assets critical to providing service to customers (well pumps vs. fluoride pumps)

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Asset inventory worksheet

Example System Inventory Worksheet

Date Worksheet Completed/Updated: *8/14/02*

Asset	Expected Useful Life	Condition	Service History	Adjusted Useful Life	Age	Remaining Useful Life
Well 1 (1993)	30	Good		30	9	21
Well 1 pump	10	Good	Rehab (1996)	10	9	1
Well 2 (1993)	30	Good		30	9	21
Well 2 pump	10	Good	Rehab (1998)	10	9	1
Pumphouse (1993)	30	Good		30	9	21
Electrical components	10	Some corrosion	Rehab (1994)	10	9	1
Chlorinator (1993)	10	Good	Rehab (1998)	5	3	2
Storage tank 1 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank 2 (1993)	40	Good	Rehab (2000) - $17,000	40	9	31
Storage tank 3 (2000)	40	Almost new		40	2	38
Distribution System:						
Hydrants (15)	40	Unknown		40	9	11
Valves (45)	40	Unknown	6 valves don't work	40	9	11
6-inch (PVC)	60	Unknown		60	9	51
4-inch (PVC)	60	Unknown		60	9	51
2-inch (PVC)	60	Unknown	Repair breaks (2/year)	60	9	51

Source: Asset Management: A Handbook for Small Water Systems

Developing an asset inventory is the first step in the creation of the asset management plan.

This will be covered later, but a list of the assets on paper may be a good way to ***start***.

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Asset prioritization

- Existing threat to public health, safety or the environment
- Potential public health, safety or environmental concern
- Internal or public safety concern
- Improved system operations and maintenance (O&M) efficiency

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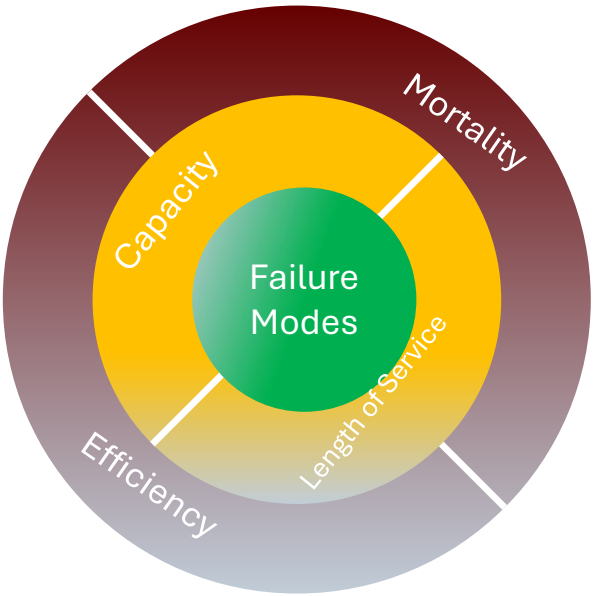
Asset management framework



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FUNDING AN ASSET MANAGEMENT PLAN

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Budgeting for asset replacement/refurbishment

- An effective funding plan addresses the current needs (expenses) of the system as well as its ***future needs***
- Set annual reserve “savings” to fund refurbishment/replace of critical and high failure probability assets
- Asset inventory creation should allow the manager to realize
  - The amount of funding should be reserved each year
  - Total reserve required by the end of some specified time period

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Budgeting worksheet

EXAMPLE **Budgeting Worksheet**

Date Worksheet Completed/Updated: *8/14/02*

Revenues		Expenses		Net Income	
Service Fees:	*$249,971*	Maintenance:	*$54,320*	Total Revenues:	*$255,430*
Fees and Service Charges (late fee, connection fee, fire fee, etc.):	*$5,284*	Utilities (power, telephone):	*$3,992*	Total Expenses:	*$245,072*
		Salaries and Benefits:	*$76,689*		
		Equipment Cost:	*$1,371*	Net Income	
Impact Fees (demand fee, system development fee, etc.):	*$175*	Chemicals:	*$40,512*	(Revenue - Expenses):	*$10,358*
Secured Funding:		Monitoring and Testing:	*$8,096*		
Interest:		Rent or Mortgage:			
Other:		Insurance:	*$1,453*		
		Professional Services (legal, accounting, engineering, etc.):	*$400*		
		Training Costs:	*$1,000*		
		Billing Costs:	*$2,500*		
		Fees (state PWS fee,franchise fee, conservation fee, etc.):	*$500*	Additional Reserves Needed	
		Security:	*$609*	Total Required Reserves:	*$34,625*
		Other (debt payments, taxes, miscellaneous, etc.):	*$53,630*		
				Net Income:	*$10,358*
				Additional Reserves Needed (Income - Required Reserves):	*-$24,267*
Total Revenues:	*$255,430*	**Total Expenses:**	*$245,072*		

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Funding mechanisms introduction

- Systems can be funded through grants, loans, or self-funding
- While grants are free, loans and self-funded projects must be paid for by system revenue
- Rate adjustments are typically the first thought when system revenue is considered
- But there are other things just as important as having a good rate structure
  - Accurate meters
  - Effective and enforceable collection policies
  - Board support (and broad support from customers) for rate structure goals

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Raising revenues or cutting costs

- Raising revenues does not have to involve raising rates
  - Non-rate based fees
  - Recover true cost of services
  - Meter change-out program
- Also examine your costs
  - Trim the fat from the system
  - Closely look at each cost line
  - Perform a management audit for the system

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If rates need to be raised…

- Look at your system's operating environment
  - Non-revenue water
  - Water loss (look at a meter change-out program)
  - Rate structure appropriate for the system Look at factors that can help you make an "informed" decision
  - Billing software has customer/month specific data for several years
- Determining the "appropriate" rate structure depends on the capacity of the board

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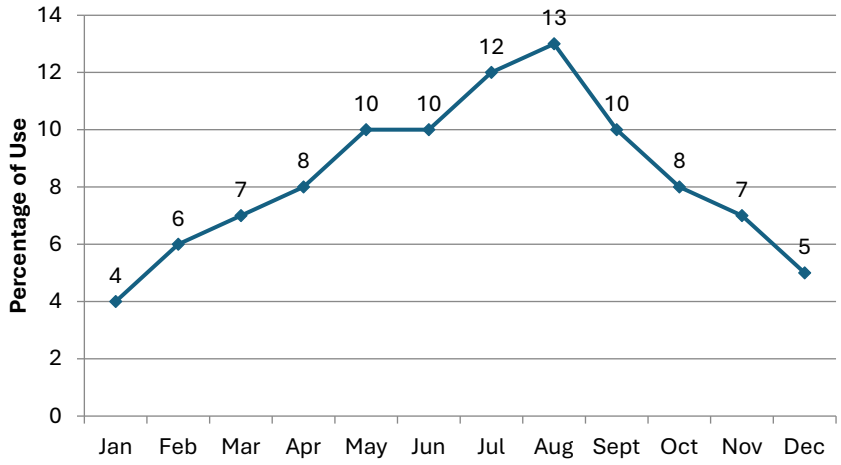
Percentage of total annual water usage by month



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Asset management tools

- Mississippi State Department of Health – Bureau of Public Water Supply
- Mississippi Department of Environmental Quality
- EPA – various publications
- Environmental Finance Centers
- AWWA – Statement of Policy on Public Water Supply Matters
- US Federal Highway Administration – Asset Management Website
- Mississippi Water and Pollution Control Operators Association
- Mississippi State University Extension Service
- Mississippi Rural Water Association

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Final points

- This is a very brief overview
- ***Asset management is a process***
- Provides tools that enable the system to predict and mitigate risk
- As with other strategic plans, must be kept up to date – work with accountant and engineer
- Many tools in existence – look at epa.gov and efc.unc.edu
- Identify and analyze failure horizon, risk and consequences
- Formulate SMART plan to mitigate risk
  - Specific
  - Measurable
  - Attainable
  - Realistic
  - Timely

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