Planning Today for Reliable Water Tomorrow

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About Us

The Environmental Finance Center Network (EFCN) is a university- and non-profit-based organization creating innovative solutions to the difficult how-to-pay issues of environmental protection and environmental infrastructure. The EFCN works collectively and independently (as individual Environmental Finance Centers) to address these issues across the entire U.S, including the 5 territories and the Navajo Nation. The EFCN aims to assist public and private sectors through training, direct professional assistance, production of durable resources, and innovative policy ideas.

What is the EFCN?

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- National network funded through the United States Environmental Protection Agency
- Provides technical assistance and training
- Helps communities address water and wastewater challenges
- Focuses on financial, managerial, and technical capacity development

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EFCN Mission

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PROMOTE SUSTAINABLE ENVIRONMENTAL INFRASTRUCTURE

STRENGTHEN UTILITY MANAGEMENT AND LEADERSHIP

IMPROVE ACCESS TO FUNDING AND FINANCING OPPORTUNITIES

SUPPORT REGULATORY COMPLIANCE AND LONG-TERM RESILIENCE

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Who Does EFCN Serve?

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- Rural water systems
- Municipal utilities
- Wastewater treatment facilities
- Tribal communities
- State agencies and Utility Districts

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Key Services Provided

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FINANCIAL PLANNING ASSISTANCE

ASSET MANAGEMENT GUIDANCE

RATE STUDIES AND RATE-SETTING SUPPORT

INFRASTRUCTURE FUNDING STRATEGIES

UTILITY MANAGEMENT TRAINING

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Why EFCN Matters

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AGING INFRASTRUCTURE REQUIRES SIGNIFICANT INVESTMENT

REGULATORY REQUIREMENTS CONTINUE TO INCREASE

SMALL AND RURAL SYSTEMS FACE LIMITED RESOURCES

SOUND FINANCIAL MANAGEMENT IS ESSENTIAL FOR SUSTAINABILITY

EFCN PROVIDES EXPERT ASSISTANCE AT LITTLE OR NO COST

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MSU Water Resources Research Institute Technical Services

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- Comprehensive System Evaluations
- Water Audits
- Financial Rate Analysis
- Cross Connection Control Program Assistance
- Treatment Optimization
- Compliance Consultation: GWR, RTCTR, LCR, etc…
- Asset Management Assistance
- Distribution System Optimization
- Chemical Feed Dosage Optimization

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Training Objectives

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- Define sustainable drinking water infrastructure
- Recognize the major threats facing water systems
- Understand the relationship between infrastructure, operations, and finances
- Identify practical strategies to improve long-term sustainability
- Develop priorities for future planning

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What Does Sustainability Mean?

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A sustainable drinking water system consistently provides safe, affordable water while maintaining infrastructure, protecting public health, and remaining financially viable.

Three pillars:

1. Infrastructure
2. Operations
3. Financial Sustainability

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Why Sustainability Matters

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AGING INFRASTRUCTURE

POPULATION CHANGES

RISING CONSTRUCTION COSTS

INFLATION

WORKFORCE SHORTAGES

INCREASING REGULATORY REQUIREMENTS

CUSTOMER EXPECTATIONS

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Poll Question #01

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"What sustainability initiative has your utility implemented or prioritized?"

A. Asset management and infrastructure planning
B. Water-loss reduction and meter improvements
C. Treatment/process optimization and energy efficiency
D. Preventive maintenance and equipment replacement

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The State of Drinking Water Infrastructure

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- Many water mains exceed 50–100 years old
- Deferred maintenance increases emergency repairs
- Treatment equipment reaches the end of useful life
- Replacement costs continue rising

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Reactive vs. Proactive Infrastructure Replacement

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Reactive	Proactive
Replace after failure	Replace based on condition and risk
Emergency spending	Planned spending
Unplanned outages	Fewer unexpected outages
Higher repair costs	Better cost control
Limited options	More time to evaluate options
Firefighting	Planning
Short-term solution	Long-term strategy

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Condition + Criticality + Consequence

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- **Age alone should not determine when an asset is replaced.**

- A 60-year-old water main that has never experienced a failure may be less urgent than a 30-year-old main that:
  - Breaks frequently
  - Serves a hospital or major industry
  - Has inadequate capacity
  - Causes significant water loss
  - Is located under a major highway

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Reactive vs. Proactive Infrastructure Replacement

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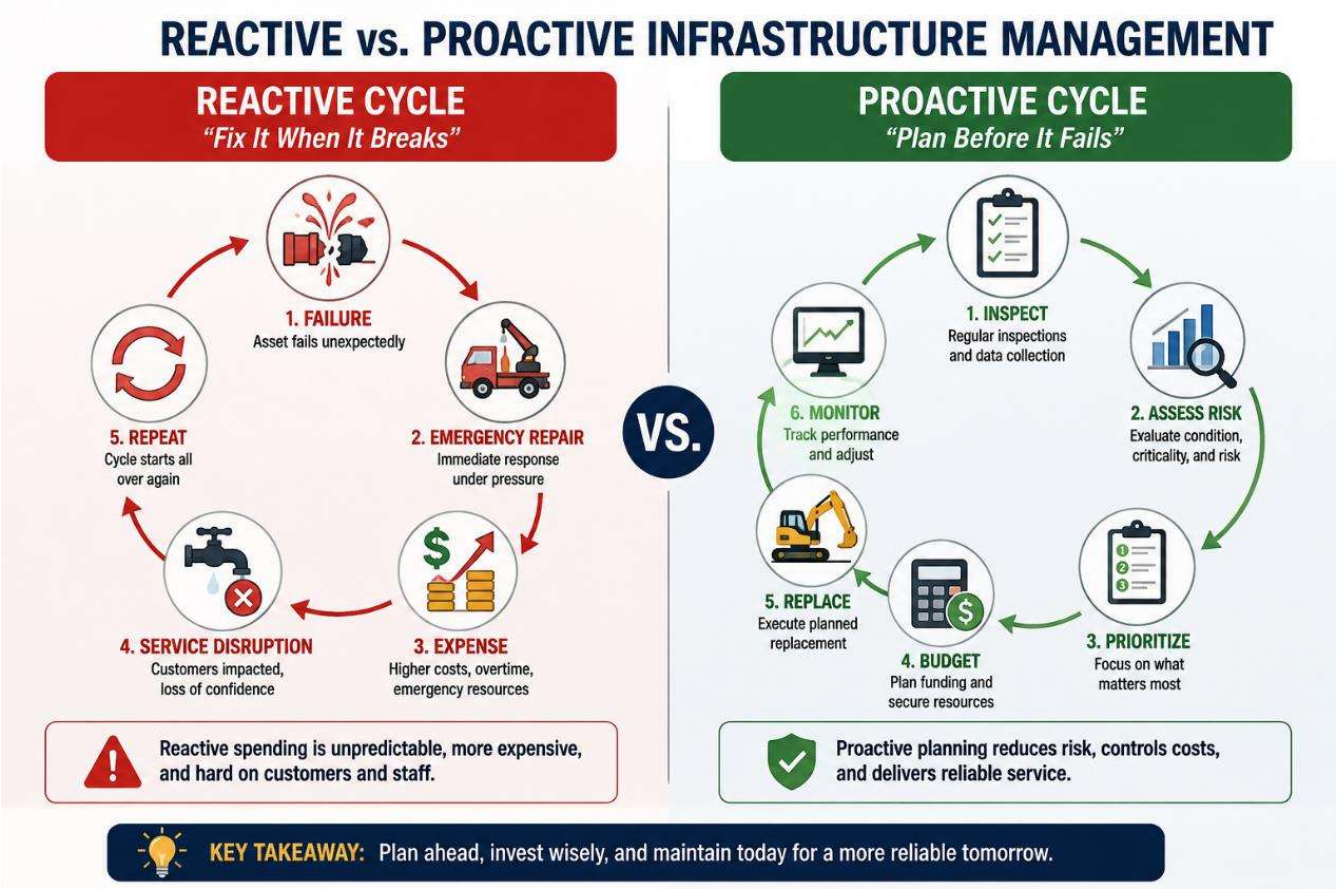

Poll Question #02

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"Which improvement could have the greatest impact on your utility over the next five years?"

A. Replacing aging water mains and critical infrastructure
B. Reducing water loss and improving system efficiency
C. Improving rates, reserves, and financial planning
D. Investing in operators, technology, and treatment optimization

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Components of Sustainable Infrastructure

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Asset Management Support

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- Inventory of critical infrastructure assets
- Condition assessment planning
- Replacement and rehabilitation scheduling
- Life cycle cost analysis
- Long-term capital planning

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Asset Management Basics

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- Wells
- Pumps
- Valves
- Tanks
- Water mains
- SCADA equipment

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Asset Management Basics

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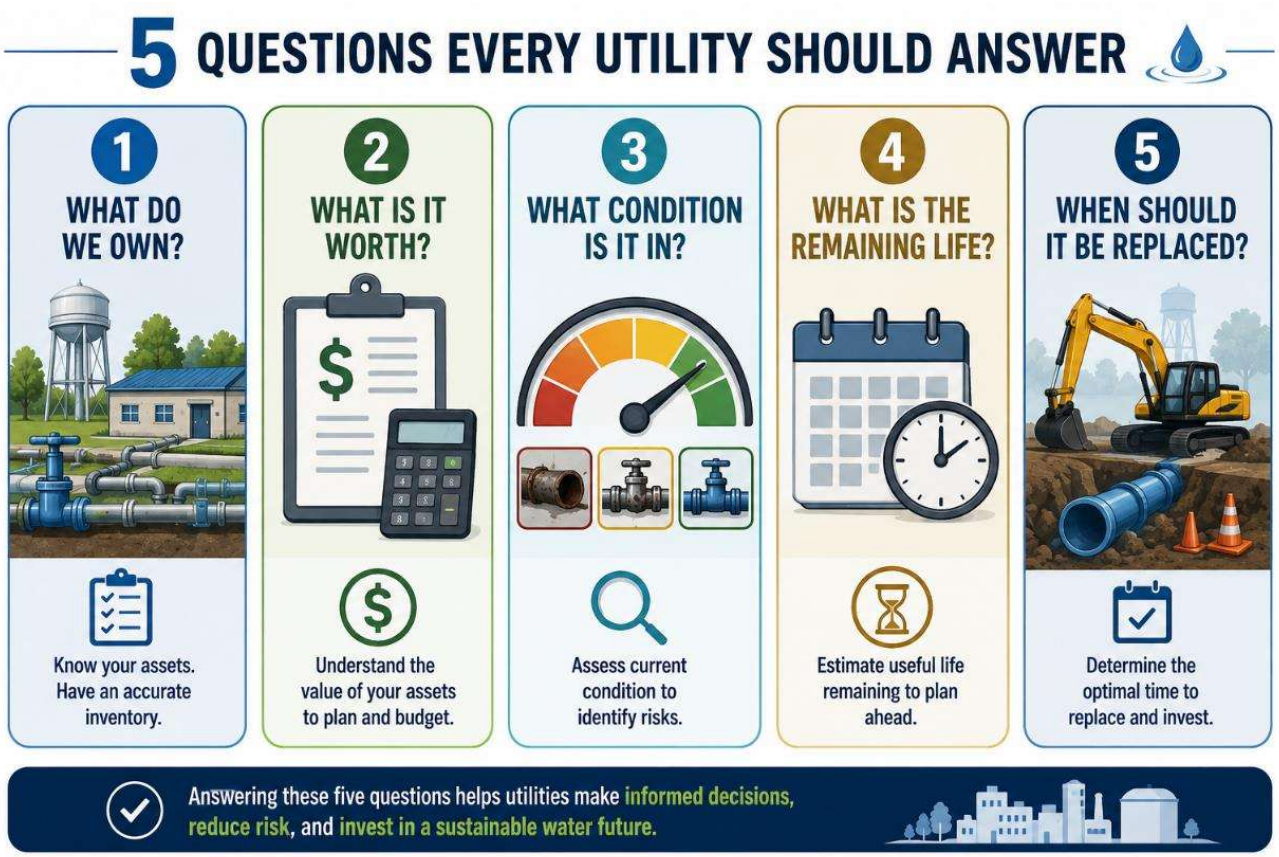

Water Loss and Infrastructure Sustainability

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REAL LOSSES

APPARENT LOSSES

NON-REVENUE WATER

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Real Losses - physical losses of treated water from the distribution system.

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- **Main breaks** – Sudden failures that can release large quantities of water.
- **Leaking water mains** – Small, continuous leaks can waste significant amounts of water over time.
- **Service line leaks** – Leaks between the main and customer meter can go unnoticed.
- **Tank and reservoir leakage** – Structural deterioration can result in continuous water loss.
- **Overflow** – Storage tanks may overflow because of faulty controls, telemetry problems, or improper operating procedures.
- **Underground leakage** – Some of the most difficult losses to identify because the water may never reach the surface.

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Apparent Losses - water that is consumed but not properly measured, billed, or accounted for.

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Inaccurate customer meters – Older meters may under-register consumption.

Unauthorized consumption – Water theft, illegal connections, or meter bypasses.

Data entry errors – Incorrect meter readings or account information.

Billing system errors – Problems transferring or processing consumption data.

Unmetered authorized use – Flushing, firefighting, construction, or other uses that aren't properly recorded.

Poor meter sizing – An improperly sized meter may not accurately measure low or high flows.

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Non-Revenue Water - water that enters the distribution system but does not generate revenue for the utility.

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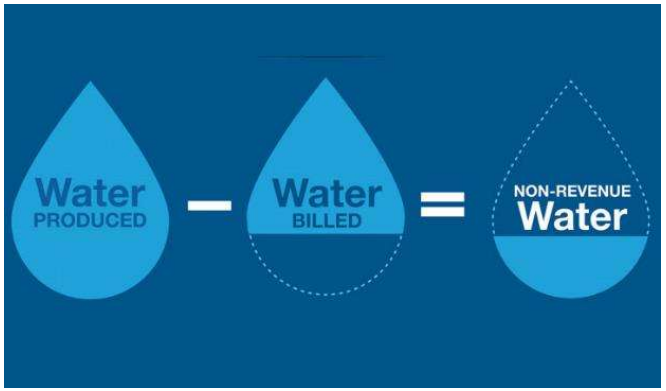

- Water Produced – Water Sold = Water That Needs an Explanation
- Real losses + Apparent losses + Authorized unbilled consumption

Benefits of Reducing Water Loss

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- Increased Revenue
- Lower Pumping Costs
- Reduced Chemical Use
- Extended Infrastructure Life

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Responsible Water-Loss Program

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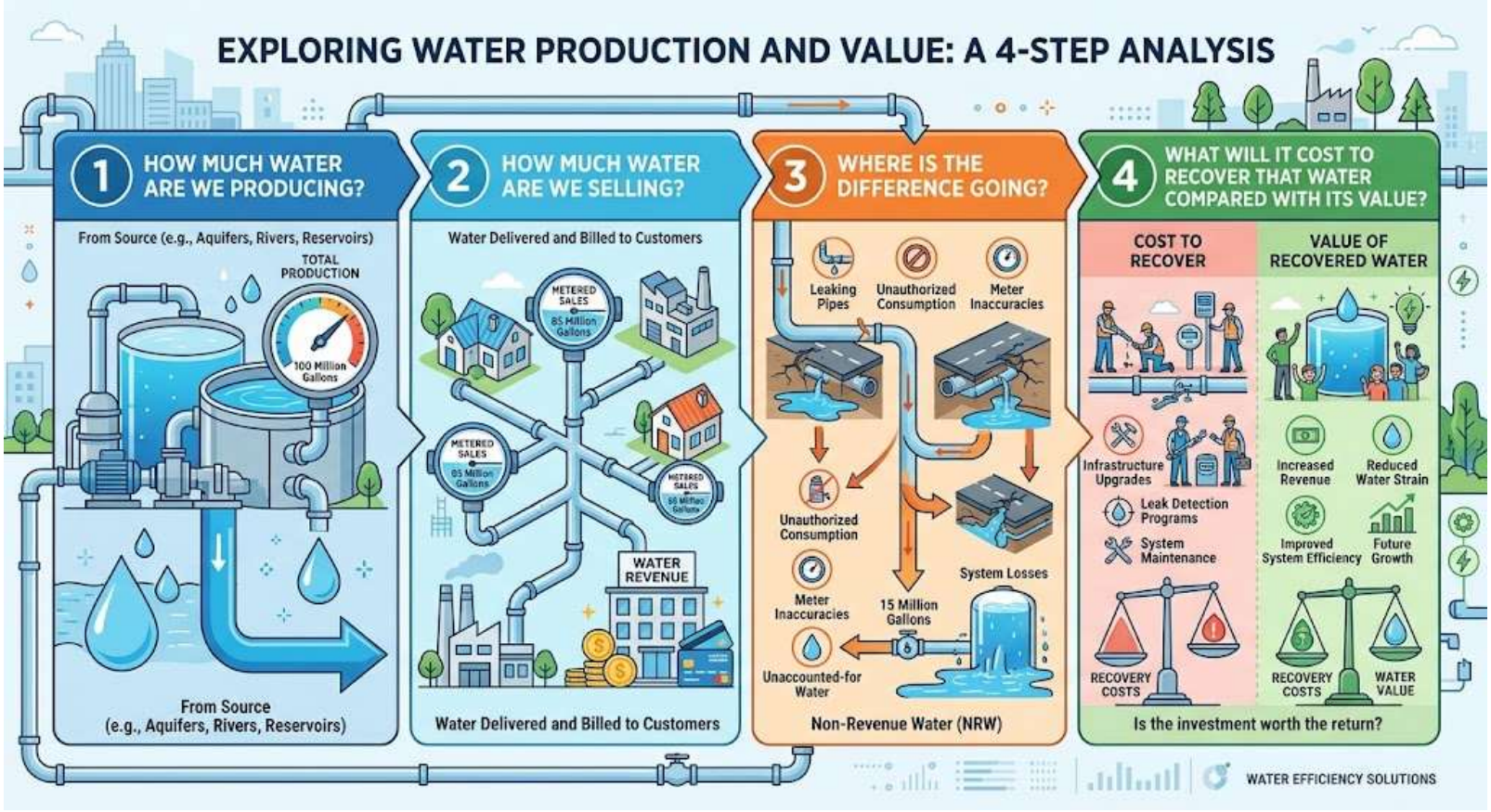

Treatment Optimization

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IMPROVED FILTER PERFORMANCE

CHEMICAL FEED ADJUSTMENTS

PROCESS MONITORING

FINISHED WATER QUALITY GOALS

DISTRIBUTION SYSTEM MONITORING

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Distribution System Sustainability

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- Flushing programs
- Valve exercising
- Hydrant maintenance
- Pressure management
- Storage tank inspections
- Dead-end management

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Workforce Sustainability

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Financial Sustainability

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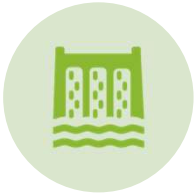

OPERATE DAILY

MAINTAIN EQUIPMENT

REPLACE AGING INFRASTRUCTURE

MEET FUTURE REGULATIONS

BUILD RESERVES

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Rate Structures Support Sustainability

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RECOVER COSTS

ENCOURAGE CONSERVATION

MAINTAIN AFFORDABILITY

FUND CAPITAL IMPROVEMENTS

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Rate Structures Support Sustainability

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Poll Question #03

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"What is the biggest obstacle to long-term infrastructure planning at your utility?"

A. Limited funding and insufficient revenue
B. Aging infrastructure and unexpected repairs
C. Staffing, workforce, and technical expertise
D. Regulatory requirements and changing priorities

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Capital Improvement Planning

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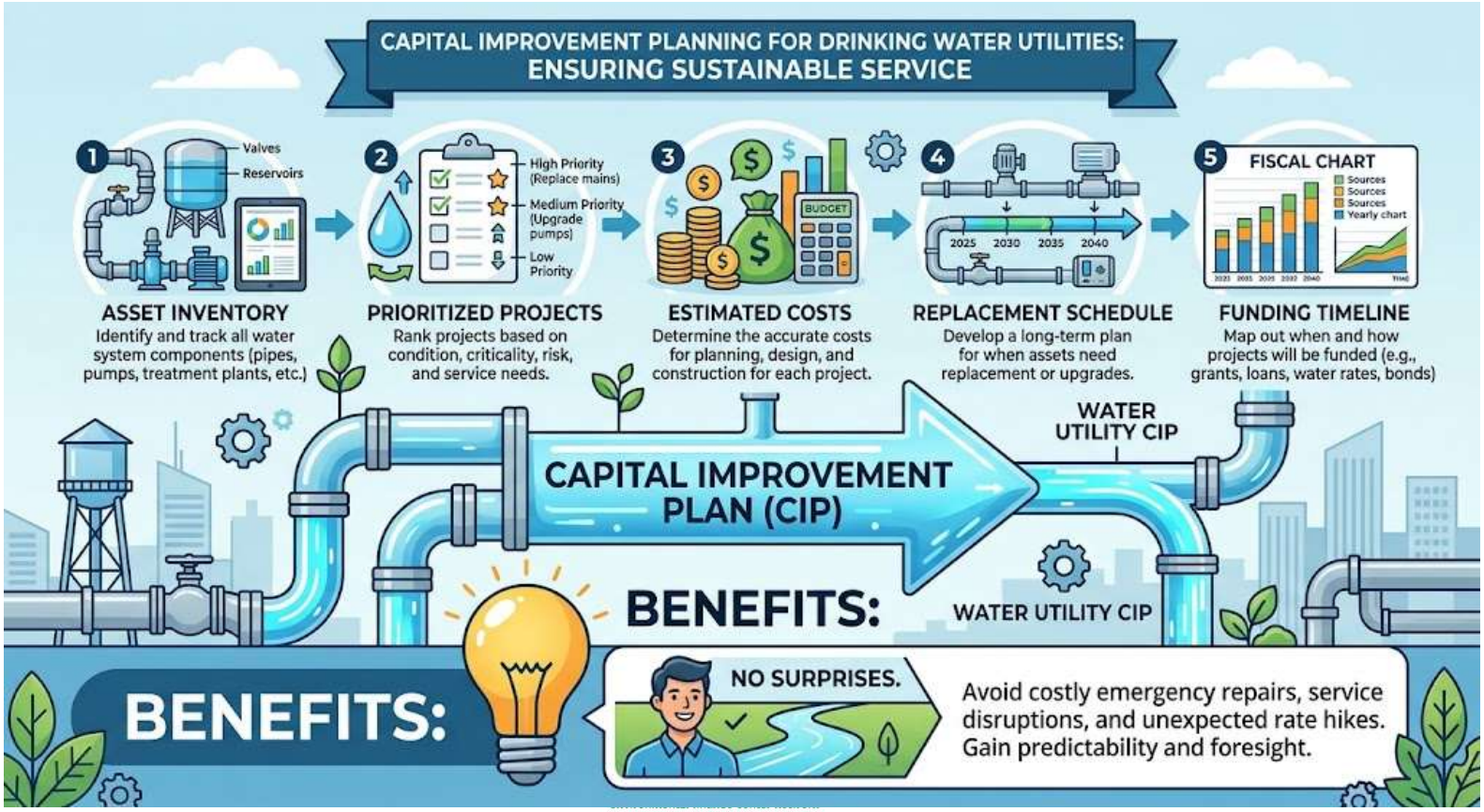

Securing Matching Funds

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Matching funds require utilities to cover a specific percentage of a project's cost (often 10% to 50%) using local revenue to qualify for state or federal grant funding

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Planning Ahead

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1. Unlocking Grant Opportunities Federal programs like the State Revolving Funds (SRF) often require matching commitment from local water authorities. Having dedicated funds set aside signals fiscal responsibility and makes applications far more competitive.

2. Smoothing Out Rate Hikes Without forward planning, a sudden water main burst or pump failure forces utilities to borrow emergency cash at high interest rates or spike local water bills overnight. CIP allows utilities to phase rate adjustments gradually over 5 to 20 years.

3. Leveraging Multi-Year Financing By aligning replacement schedules with grant application windows, utilities can stack multiple funding sources—combining local reserves with principal-forgiveness loans and federal grants.

4. Eliminating Unplanned Disruptions Proactive planning transforms unexpected, multi-million-dollar emergency repairs into scheduled, routine maintenance—ensuring continuous service and stabilizing community water rates.

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Funding Opportunities

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- State Revolving Funds (SRF)
- USDA Rural Development
- Grants
- Bonds
- Local funding
- Reserve accounts

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Technology for Sustainable Utilities

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AMI/AMR METERING

GIS MAPPING

SCADA

LEAK DETECTION

ASSET MANAGEMENT SOFTWARE

DATA ANALYTICS

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Climate Resilience and Emergency Preparedness

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Case Study

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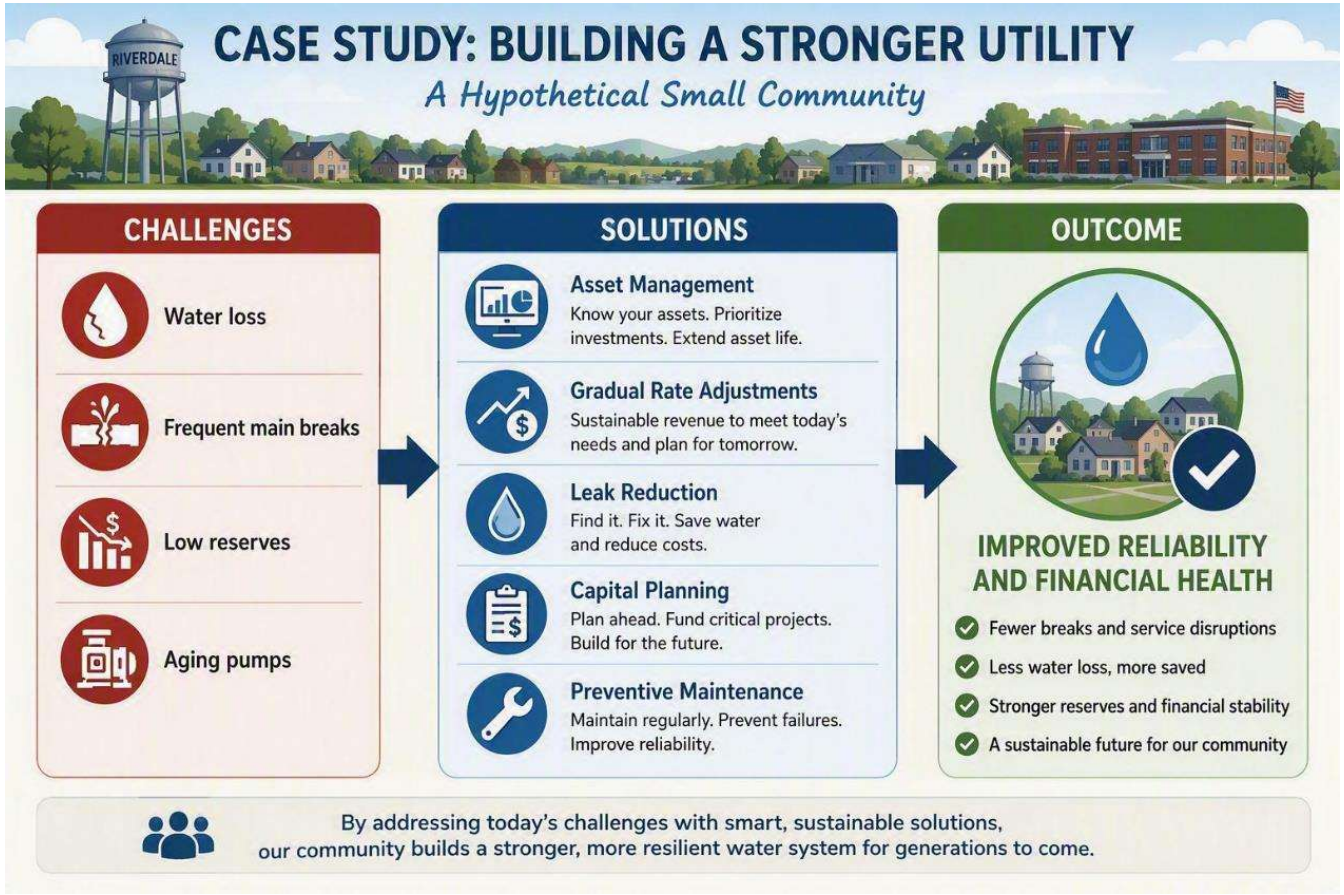

Closing Poll Question

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"If your utility had funding for only ONE major improvement, where would you invest it?"

A. Treatment plant upgrades
B. Distribution system replacement
C. Storage, pumping, and electrical improvements
D. Technology, workforce, and operational improvements

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Key Takeaways

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STRONG LEADERSHIP

PREVENTIVE MAINTENANCE

ASSET MANAGEMENT

FINANCIAL PLANNING

WORKFORCE DEVELOPMENT

INFRASTRUCTURE INVESTMENT

CONTINUOUS OPTIMIZATION

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Questions and Discussion

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