

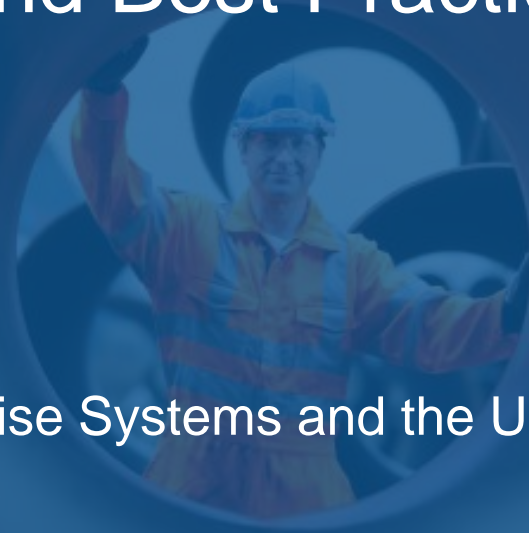
Optimization of Public Utilities: An Overview of Trends and Best Practices

JD Solomon, PE, CRE, CMRP

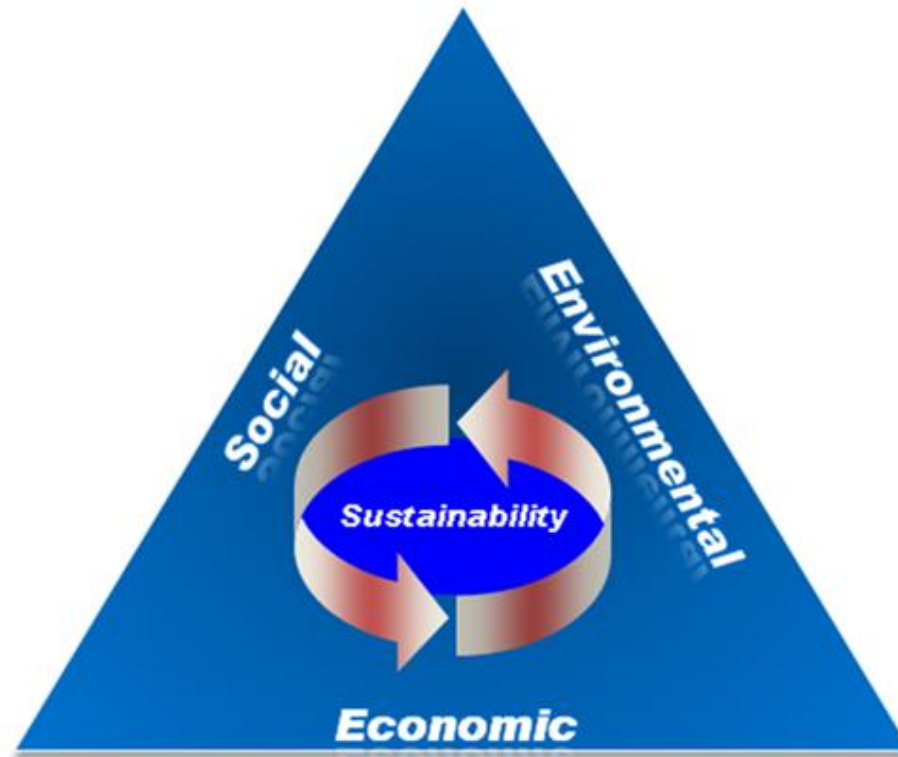
NC House Committee on Public Enterprise Systems and the Use of Funds
May 5, 2014

**Water Infrastructure
Asset Management:**

Best Practices to Enable Better Investments

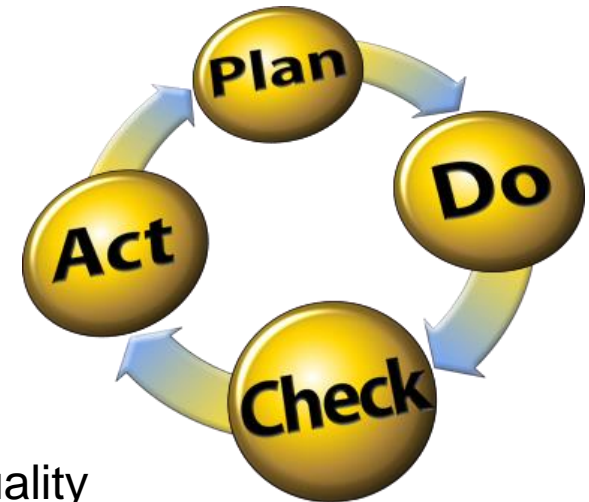


Triple Bottom Line



Continuous Improvement, Optimization, & Asset Management

- Continuous improvement is an ongoing effort to improve products, services or processes. These efforts can seek “incremental” improvement over time or “breakthrough” improvement all at once.
- Formal approaches for continuous improvement and optimization have been used in the private sector for generations.
- Some common tools and methods
 - Shewart Cycle (Plan-Do-Act-Check)
 - Six Sigma – focus on quality
 - Lean – focus on reducing waste
 - TQM – focus on quality and minimizing defects
 - Environmental Management Systems – focus on quality
 - Asset Management – focus on risk, level of service, and lifecycle costs



Asset Management Definitions

Asset Management: An integrated set of processes to minimize the life-cycle costs of infrastructure assets, at an acceptable level of risk, while continuously delivering established levels of service.

Implementing Asset Management: A Practical Guide

Asset Management: The systematic and coordinated activities of an organization to optimally and sustainably deliver on its objectives through the cost-effective lifecycle management of assets.

International Infrastructure Management Manual

Asset Management: The coordinated activities that an organization uses to realize value from assets in the delivery of its outcomes and objectives. Realization of value requires the achievement of a balance of costs, risks and benefits, often over different timescales.

Asset management can only be effective in the context of the organizational objectives and when considering the operating environment of the organization.

ISO 55000 (2013 Ratified Standard)

159G-20. Definitions.

The following definitions apply in this Chapter:

(1) Asset management plan. - The strategic and systematic application of management practices applied to the infrastructure assets of a local government unit in order to minimize the total costs of acquiring, operating, maintaining, improving, and replacing the assets while at the same time maximizing the efficiency, reliability, and value of the assets.

Some key elements of Asset Management

- Strategic Plan
- Service Levels
- Risk Management
- Life Cycle Analysis
- CIP Prioritization
- Renewal & Replacement Forecasts
- Triple Bottom Line
- Data and Data Systems
- Role Clarification
- Succession Planning
- Training and Retention
- Business Cases
- Decision Support Systems
- Performance Measurement
- Benchmarking



Effective Utility Management – The 10 Attributes

Product Quality

1. Product quality regulatory compliance
2. Product quality service delivery

Customer Satisfaction

1. Customer complaints
2. Customer service delivery
3. Customer satisfaction

Employee and Leadership Development

1. Employee retention and satisfaction
2. Management of core competencies
3. Workforce succession preparedness

Operational Optimization

1. Resource optimization
2. Water management efficiency

Financial Viability

1. Budget management effectiveness
2. Financial procedure integrity
3. Bond ratings
4. Rate adequacy

Infrastructure Stability

1. Asset inventory
2. Asset (system) renewal/replacement
3. Water distribution/collection system integrity
4. Planned maintenance

Operational Resiliency

1. Recordable incidents of injury or illnesses
2. Insurance claims
3. Risk assessment and response preparedness
4. Ongoing operational resiliency
5. Operational resiliency under emergency conditions

Community Sustainability

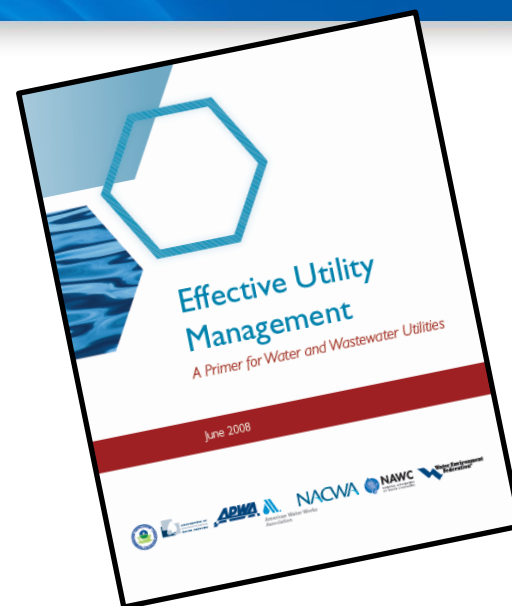
1. Watershed-based infrastructure planning
2. Green infrastructure
3. Greenhouse gas emissions
4. Service affordability

Water Resource Adequacy

1. Water supply adequacy
2. Supply and demand management

Stakeholder Understanding and Support

1. Stakeholder consultation
2. Stakeholder satisfaction
3. Internal benefits from stakeholder input
4. Comparative rate rank
5. Media/press coverage



5 Keys to Management Success

1. Leadership
2. Strategic Business Planning
3. Organizational Approaches
4. Measurement
5. Continual Business Improvement Framework

EUM Self-Assessment Tool

- The Self-Assessment Tool includes Practice Areas for each of the 10 EUM Attributes as well as key metrics to measure performance for each of those practices.
- The Tool enables utilities to select and weigh their relevant attributes and practices, and then assess those practices for both current and target performance.
- This guide explains the steps necessary to use the tool and leverage its capabilities.
- For additional information on Effective Utility Management, please visit <http://watereum.org/>

Step 1

Candidly Assess
Current
Conditions

Step 2

Rank Importance of
Each Attribute to
Your Utility

Step 3

Graph Attributes
to Determine
Importance and
Level of
Achievement

Step 4

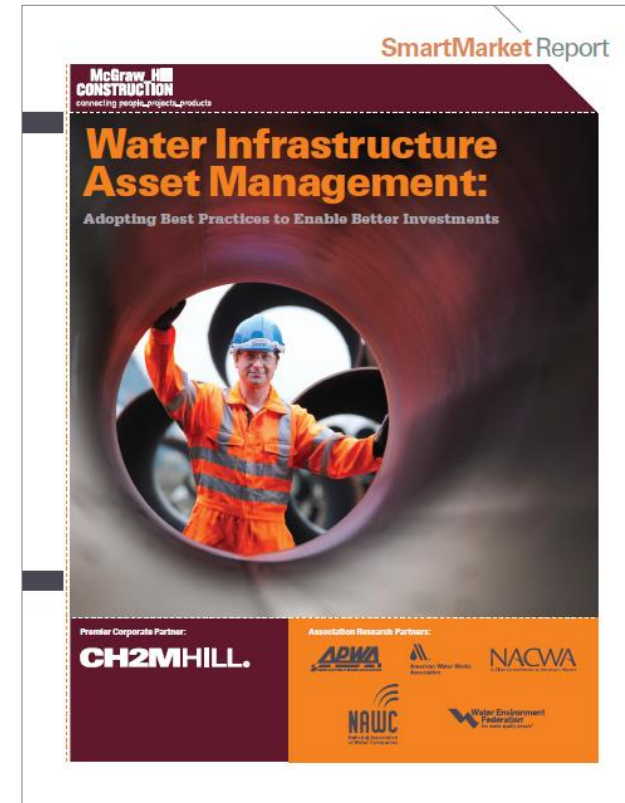
Choose Attributes

Step 5

Develop and
Implement an
Improvement Plan

What Are Utilities Really Doing?

- McGraw-Hill Construction conducted the 2012 Water Utility Asset Management Study to explore trends in U.S. and Canadian asset management, including:
 - Strategies for asset maintenance, repair, and replacement
 - Asset management practices undertaken or planning to undertake
 - Decision process to initiate asset management
 - Key criteria and influencers for implementing asset management
 - Drivers of and obstacles to engaging in asset management
 - Methods for evaluating asset management achievements
 - Metrics
- Released at 2013 Utility Management Conference



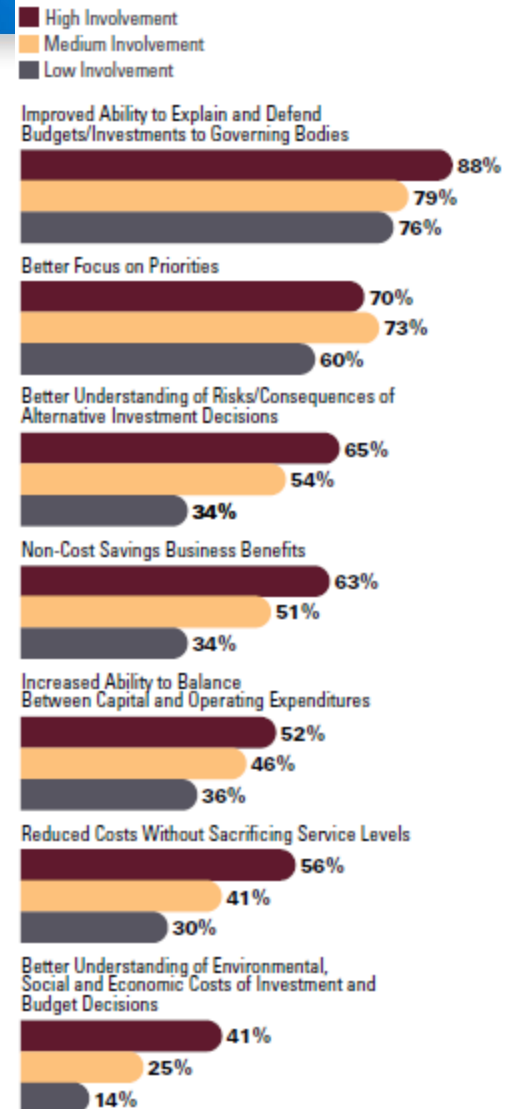
Top Benefits for Asset Management

- 75% to 90% of practitioners cited **“Improved Ability to Explain and Defend Budget/Investments to Governing Bodies”**
- 60 to 70% of practitioners cited **“Better Focus on Priorities”**
- 50% or more of mid-level and high-level practitioners cited:
 - Better understanding of risk & consequences of alternative investment decisions
 - Non-cost saving business benefits
 - Increased ability to balance between capital and operating expenditures

Top Seven Benefits From Asset Management Approach

(According to Practitioners By Position on the Asset Management Spectrum of Use)

Source: McGraw-Hill Construction, 2013



Top 14 Current Practices

- Variation by Region
 - Less in Midwest
 - More in East and South
- Variation by Water vs. Wastewater
 - No statistical difference
- Variation by Size (population)
 - Population 50,000 or less
 - Average of four practices
 - Population of 50,000 to 100,000
 - Average of six practices
 - Population of more than 500,000
 - Average of seven practices

Asset Management Practices Currently in Use

Source: McGraw-Hill Construction, 2013



US Water & Wastewater Industry

Current and Emerging Trends

- **New Delivery Platforms**
 - Public Private Partnerships (PPP; lease your utility)
 - Contract Operations (retain ownership; no “lease”)
 - Own and Optimize
- **Regionalization and Partnerships**
- **Focus on Core Asset Management Practices**
 - Detailed focus on O&M
 - IT/IS Consolidation – Fewer Systems is Better
 - Better understanding of risk, reliability, and redundancy
 - Resiliency
- **Aging Workforce & fewer high school Graduates Going into Trades**
- **Stormwater as a growing topic**
 - Building backlog of new assets
 - Funding and bonding related questions
 - More aggressive regulatory drivers

Typical Regional Water & Wastewater Utility References and Structures

- Unit of City or County Government
- Inter-local Agreements: Normally in form of a MOU or MOA. Usually for planning level studies, emergency connections, and wholesale agreements.
- Districts and Authorities: Some form in every state but legal definition varies. Both often cross political boundaries of units of local government. Varies by state, but Districts often have some form of ad valorem taxing authority while Authorities do not.
- Merged Utilities: One unit of local government, district, or authority cedes its assets to another. Owning entity has full control over assets and some powers of local government.

Typical Regional Water & Wastewater Utility References and Structures - Unique

- Most states have one or two examples of unique structures
- Normally in the form of two public utilities forming a partnership to build a raw water supply or a treatment facility.
- Normally some form of special legislation whereby public parties bring financial contributions in exchange for a portion of the shared entity.
- Normally one entity agrees to operate or a third party operates, all parties agree to reimburse each other proportional to ownership for the operations & maintenance (O&M) expenses.
- If a third party private entity provides operations and maintenance, but the public utility owns the asset, then this is commonly referred to as contract operations.

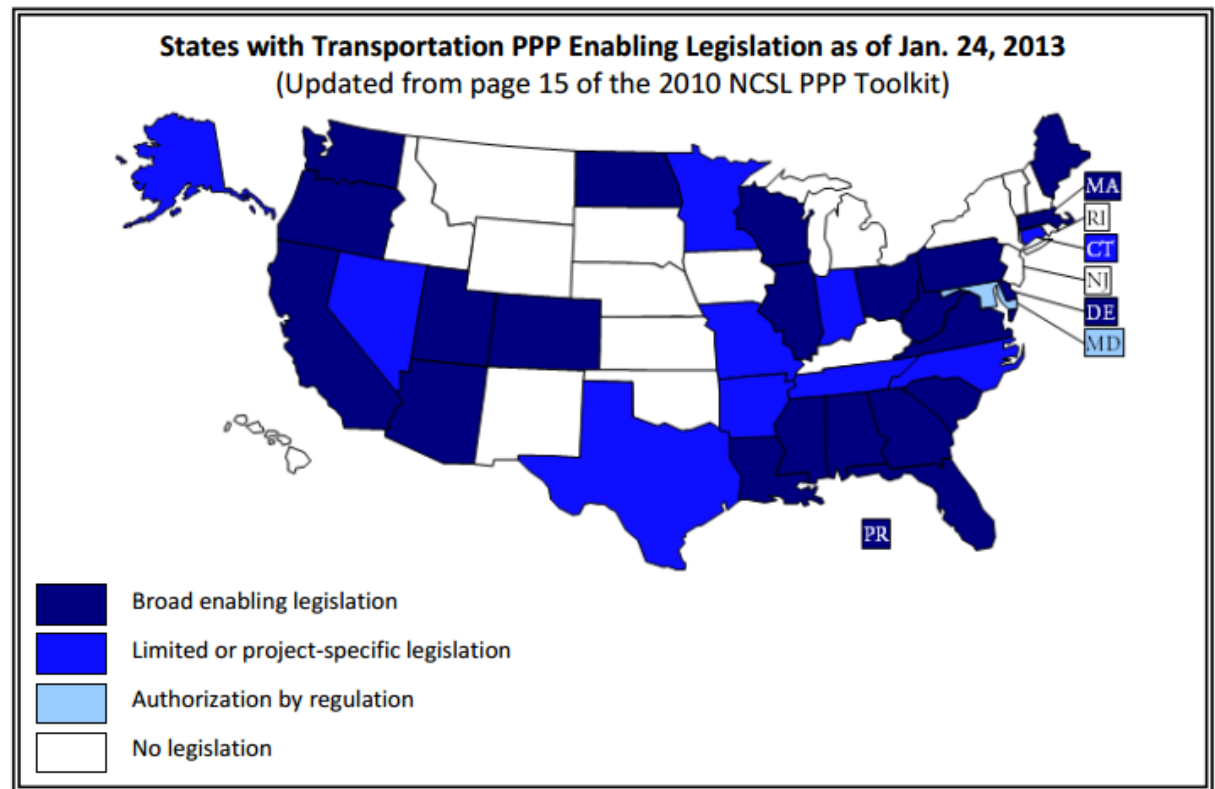
Typical Regional Water & Wastewater Utility References and Structures - Privatization

- Utility may be wholly owned by a private sector entity. In majority of states will take the general form of an investor owned utility and will be regulated by the state utilities commission.
- Utility may take the form of a public-private partnership. Under this general structure, the private entity basically leases and operates the utility for some period of time.
 - Until recent years, this often was applied to the construction of new facilities and may have been commonly known as design-build-finance-operate.
 - In recent years, this has taken the form of a cash payment to the local government in exchange for the private company having the right to lease and operate the utility and make profit from the optimization of improved operations.
- Privatization requires the exchange of some form of equity position by the new party. Otherwise, it is simply contract operations.

P3 Options Becoming More Available

Numerous states have enacted P3 enabling legislation; historically focused on transportation, but most statutes apply for water projects as well.

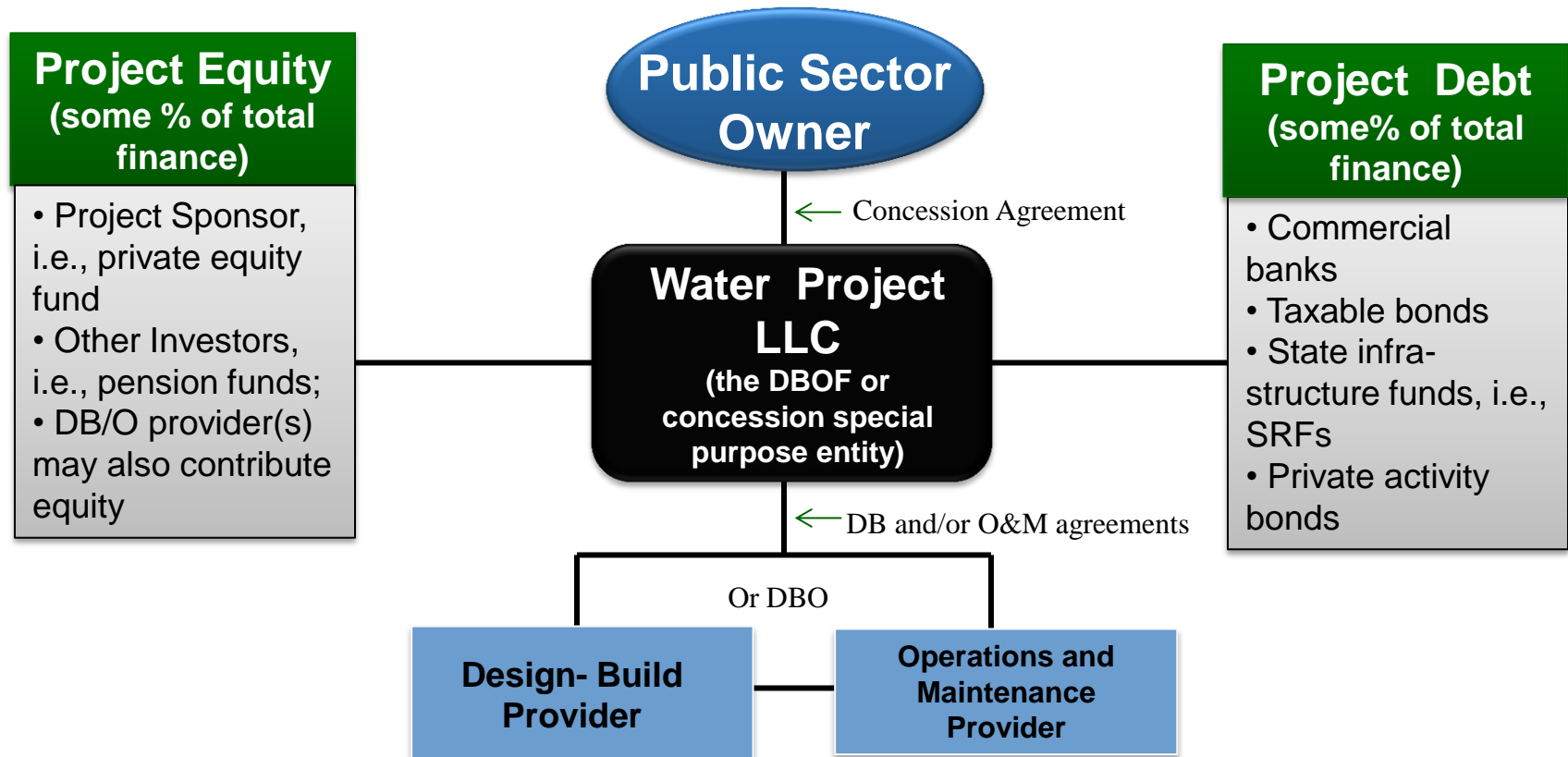
Center for American Progress estimates at least \$60 billion in available funding for infrastructure from public employee and labor pension funds. Infrastructure assets such as water projects offer stable, long-term investment returns AND job creation.



Source: National Conference of State Legislatures 2013

How does a privatization project work?

DBOF or Concession Structure Example



Only one core contract for Owner to manage –
with the DBOF or concession manager

Why water & wastewater system owners are looking for alternative solutions

- **Traditional funding sources– bonds, SRF loans, grants – may be limited**
- Credit quality deterioration or bonding capacity limitations
- Competing budget pressures, i.e. pension, health care, and social services costs
- **Deferred investment creates more urgent need for water infrastructure expansions or upgrades**
- Prospect of rate shock from new investments
- Aging work force increases operational challenges

Summary

- Water & wastewater utility management throughout the US has become more complex over the past two to three decades as expectations have increased from ratepayers and other stakeholders while assets have aged and outside funding has decreased.
- The new paradigm of optimization, greater efficiencies, and less funding has created meaningful challenges for traditional public utilities across the country.
- There is no one single solution that will simply fix everything.
- Utilities should more aggressively charge rates that reflect their long-term operations needs, those funds should be kept and utilized for operations the utility, and more structure and training is needed in the area of general utility management (asset management)
- Public-Public, Public-Private, and Privatization are all viable approaches for optimization and increased efficiencies. Any and all should be equally encouraged.

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