THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR

DEPARTMENT OF
PUBLIC UTILITIES

ARCADIS
Design & Consultancy
for natural and
built assets

INTEGRATING ASSET MANAGEMENT AND CONTINGENCY PLANNING INTO ONE PLAN

Government Affairs Workshop
March 9, 2017

Today's Agenda

- What is Asset Management?
- Asset Management Drivers in the US
- Ohio EPA Proposed Asset Management Regulations and Support Materials
- Compare Regulations Overlap
- Ohio Contingency Plan Regulations
- Questions & Discussion

Asset Management Definition – adapted from USEPA…

Asset Management is a body of management practices that…

Targets the acceptable level of risk to the organization

Delivers service levels customers desire and regulators require

Applies to the entire portfolio of infrastructure assets at all levels of the organization

Seeks to minimize total costs of acquiring, operating, maintaining, and renewing assets

Works within an environment of limited resources

Typical Drivers in the US are Evolving…

Capital Budgets

- "Wish list"
- Unaffordable Budgets
- Aging Infrastructure

State/Federal Requirements

- NPDES permits and consent decrees
- SRF loans

Bond Rating

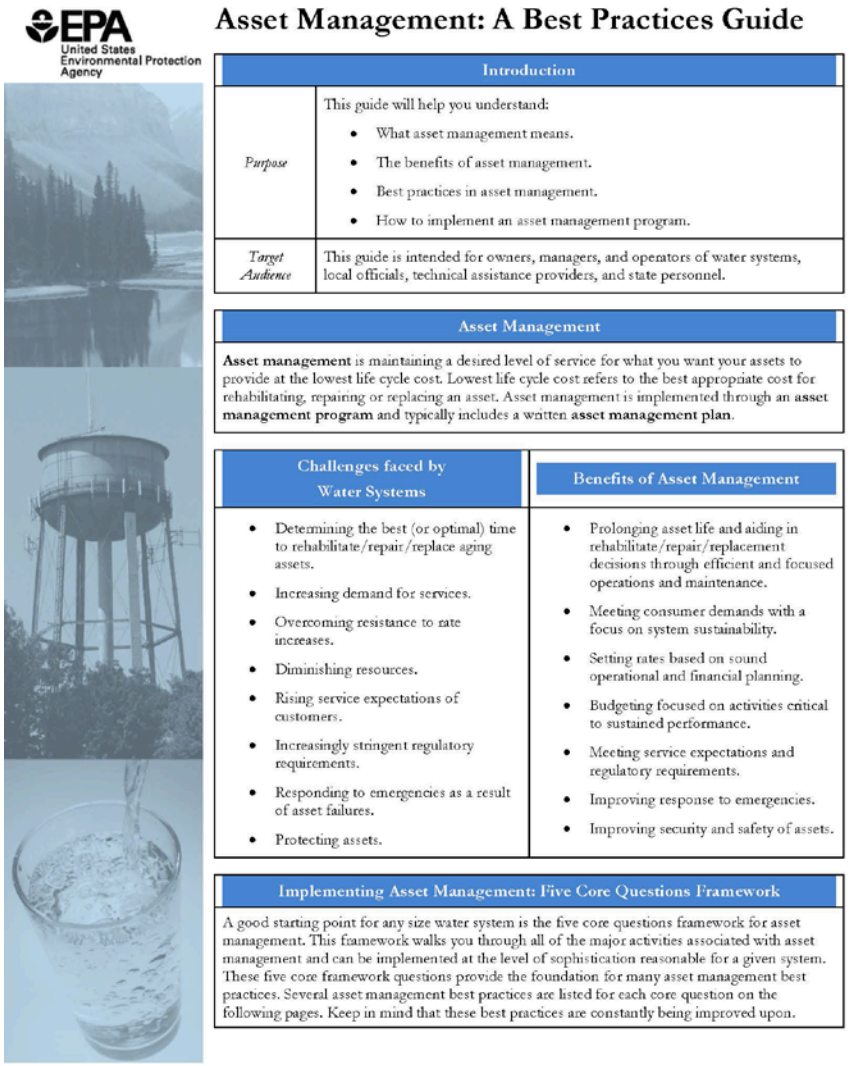
- Rating agencies starting to look for it

Technology Issues

- Incomplete data sets
- Poor hierarchies
- Lack of value

Asset Management Trend for US

- US EPA mandating Asset Management
  - Capacity, Management, Operations, and Maintenance (CMOM) Program
  - Administrative Orders (Ohio Wastewater Utilities)
- Several States are promoting asset management
  - Permit Requirement
  - SRF Funding Requirement
  - Principal Forgiveness
  - Grants



EPA United States Environmental Protection Agency

Asset Management: A Best Practices Guide

Introduction

Purpose	This guide will help you understand: • What asset management means. • The benefits of asset management. • Best practices in asset management. • How to implement an asset management program.
Target Audience	This guide is intended for owners, managers, and operators of water systems, local officials, technical assistance providers, and state personnel.

Asset Management

Asset management is maintaining a desired level of service for what you want your assets to provide at the lowest life cycle cost. Lowest life cycle cost refers to the best appropriate cost for rehabilitating, repairing or replacing an asset. Asset management is implemented through an **asset management program** and typically includes a written **asset management plan**.

Challenges faced by Water Systems

- Determining the best (or optimal) time to rehabilitate/repair/replace aging assets.
- Increasing demand for services.
- Overcoming resistance to rate increases.
- Diminishing resources.
- Rising service expectations of customers.
- Increasingly stringent regulatory requirements.
- Responding to emergencies as a result of asset failures.
- Protecting assets.

Benefits of Asset Management

- Prolonging asset life and aiding in rehabilitate/repair/replacement decisions through efficient and focused operations and maintenance.
- Meeting consumer demands with a focus on system sustainability.
- Setting rates based on sound operational and financial planning.
- Budgeting focused on activities critical to sustained performance.
- Meeting service expectations and regulatory requirements.
- Improving response to emergencies.
- Improving security and safety of assets.

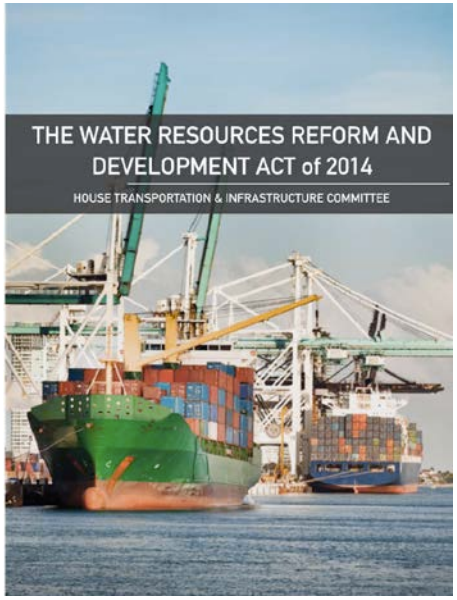
Implementing Asset Management: Five Core Questions Framework

A good starting point for any size water system is the five core questions framework for asset management. This framework walks you through all of the major activities associated with asset management and can be implemented at the level of sophistication reasonable for a given system. These five core framework questions provide the foundation for many asset management best practices. Several asset management best practices are listed for each core question on the following pages. Keep in mind that these best practices are constantly being improved upon.

AWWA Survey of Asset Management Requirements for State Revolving Funds and Other Programs

Water Resources Reform and Develop Act (WRRDA) of 2014

- Requires Fiscal Sustainability Plans (FSPs) for Clean Water SRF Loan Recipients



FSP Requirements:

Asset Management

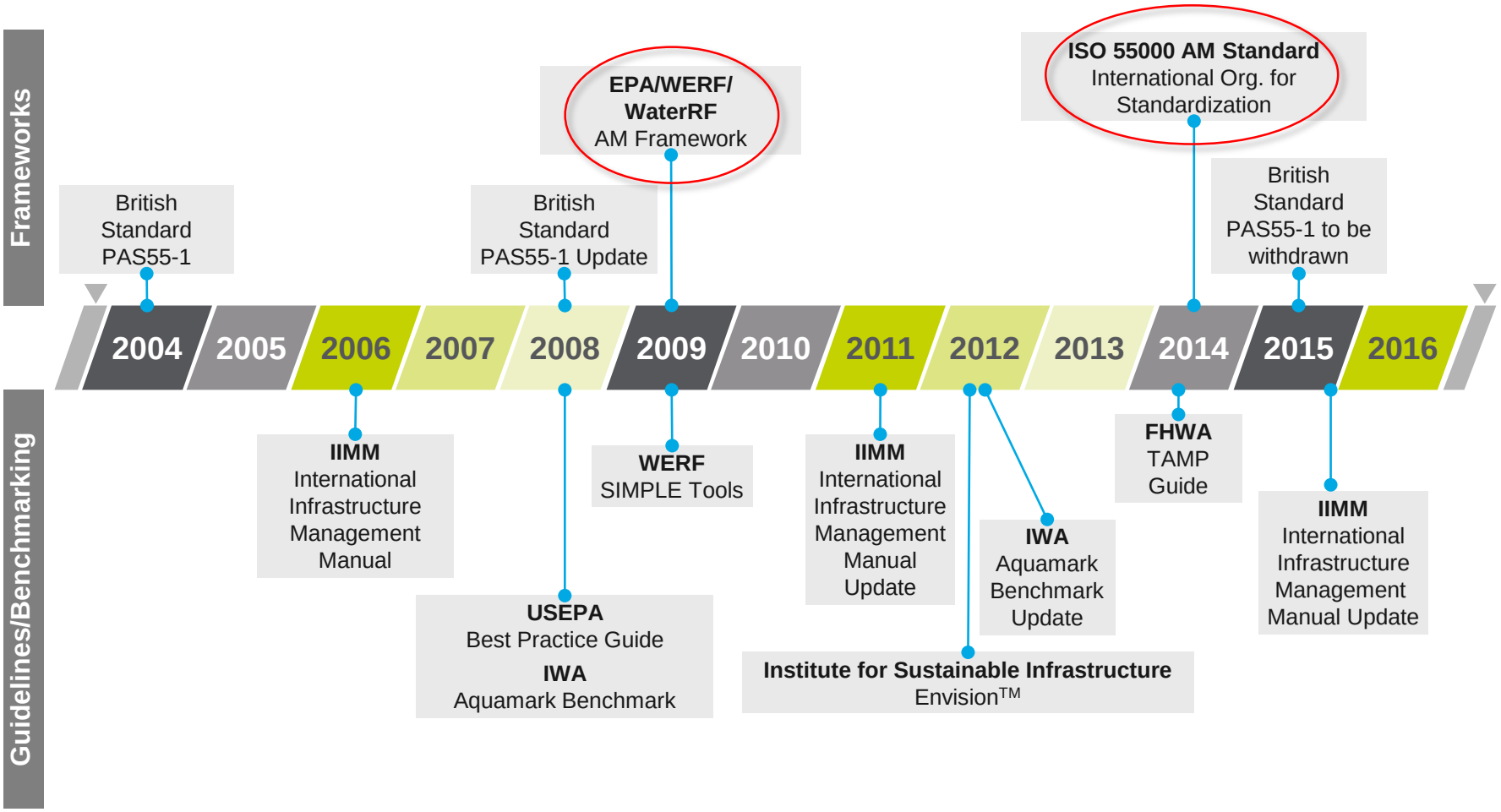
- Inventory of critical assets
- Evaluation of condition and performance of assets
- Plan for maintaining, repairing, or replacing assets
- Plan for funding these activities
- Certification of consideration and implementation of energy and water conservations

Ohio EPA Proposed Asset Management Plan Requirements (SB 2)

A public water system shall include in the plan all of the following:

1. An **Inventory** and **evaluation** of all assets;
2. Operation and maintenance programs;
3. An emergency preparedness and contingency planning program;
4. Criteria and timelines for infrastructure **rehabilitation and replacemen**t;
5. Approved capacity projections and capital improvement planning;
6. A long-term funding strategy to support asset management plan implementation.

Asset Management Evolution: Two Widely Recognized Frameworks

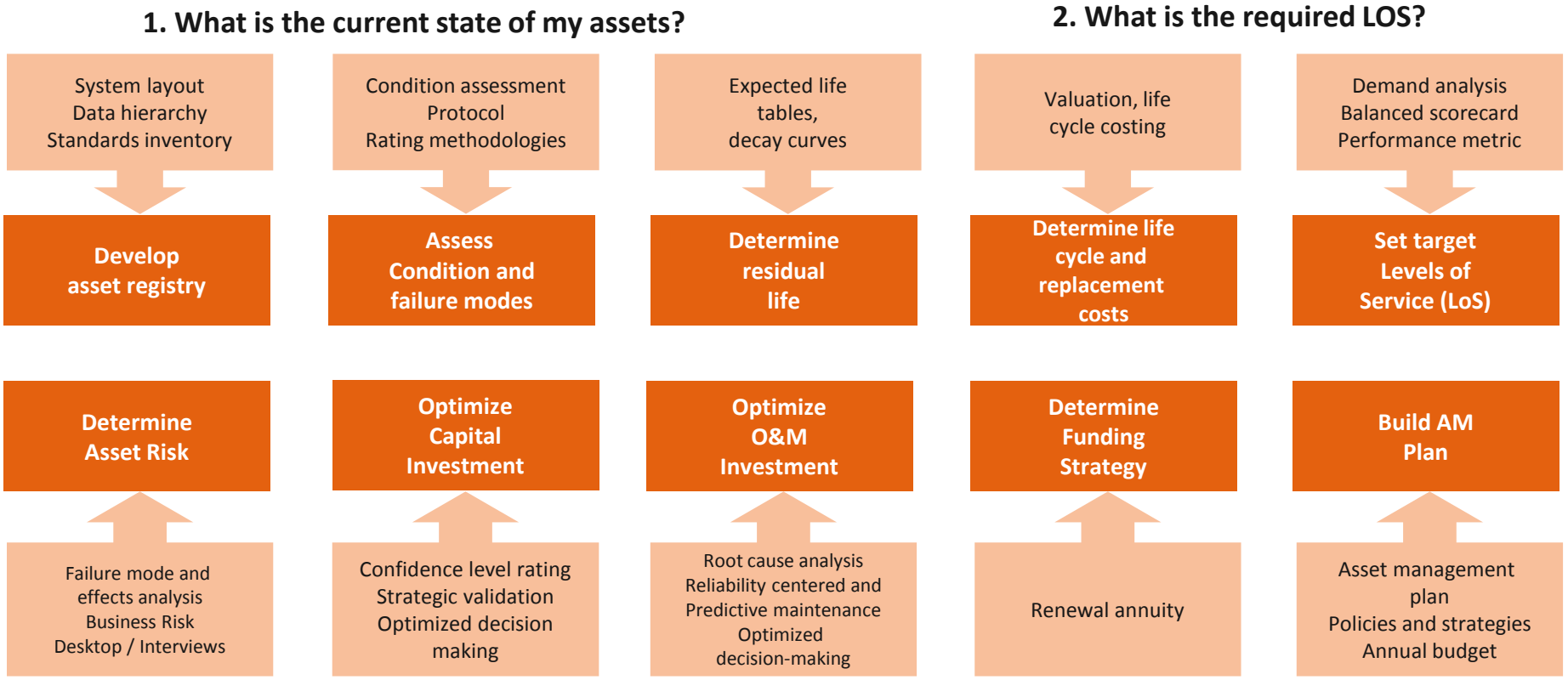


Introduction to Best Practices

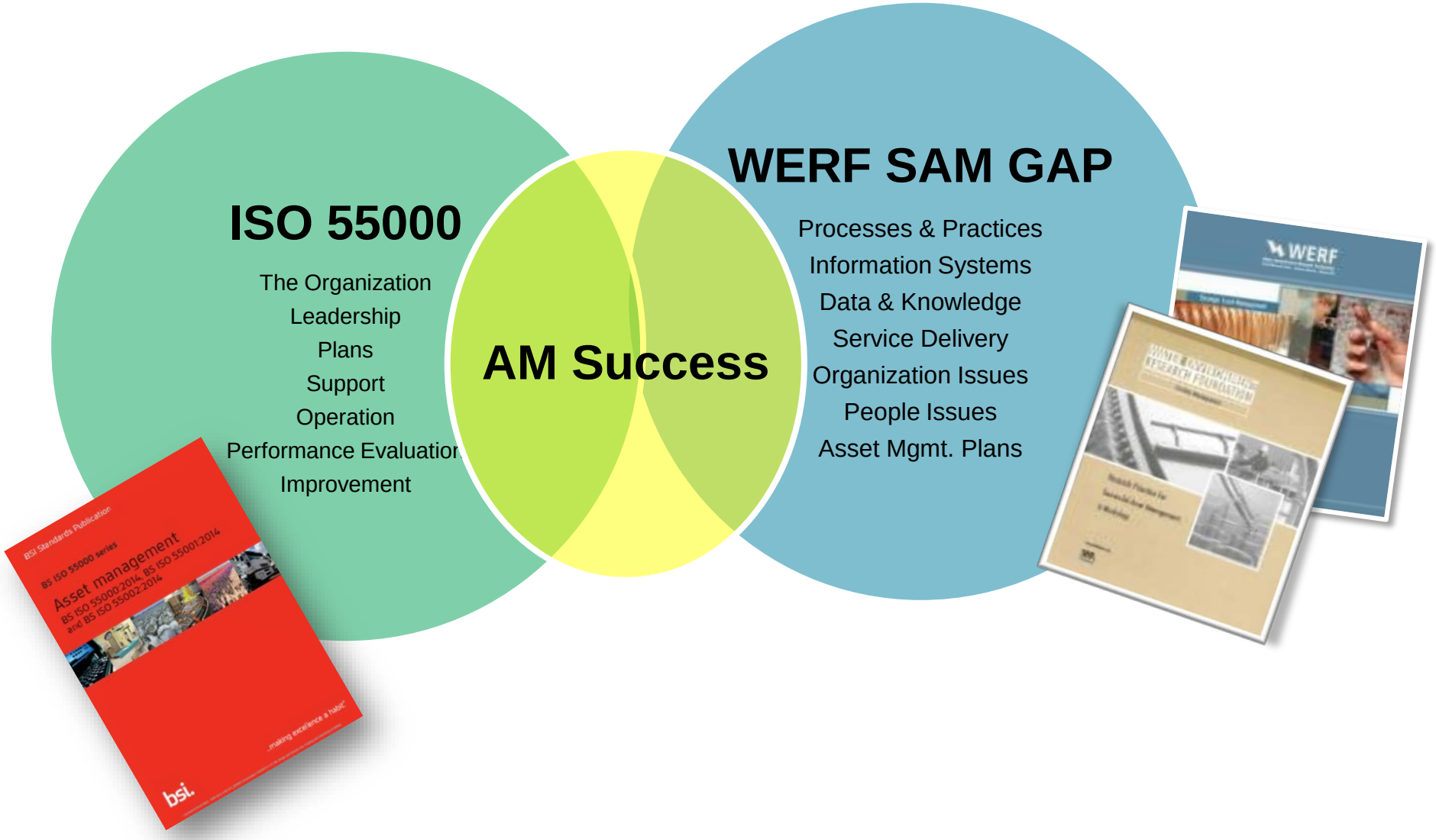
ISO 55000 – “what” a program requires

- A management system standard, like others you may be familiar with such as ISO 9001, ISO 14001, etc.
  - ISO 55000 – Overview, Principles and Terminology
  - ISO 55001 – Requirements
  - ISO 55002 – Guidelines

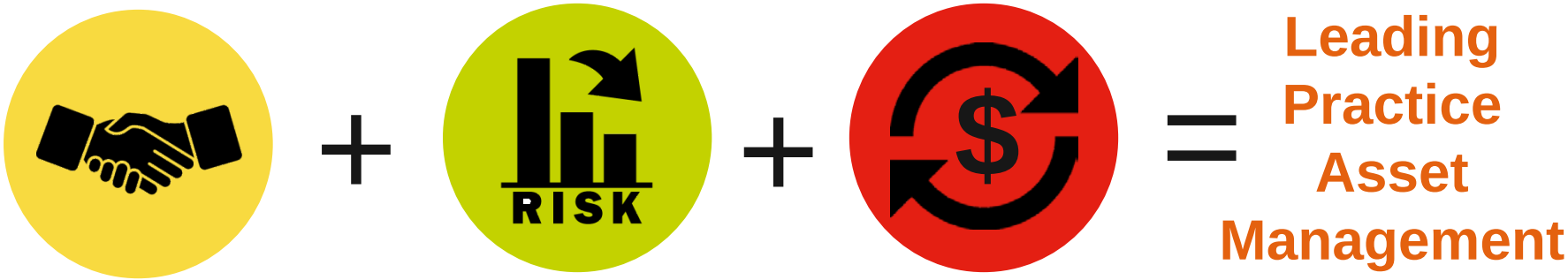
EPA / WERF/ WaterRF Framework



Best in Class Programs Use a Blended Approach



Leading Practice Concepts of Asset Management for Capital Planning



Levels of Service Based on Customer and Stakeholder Expectations

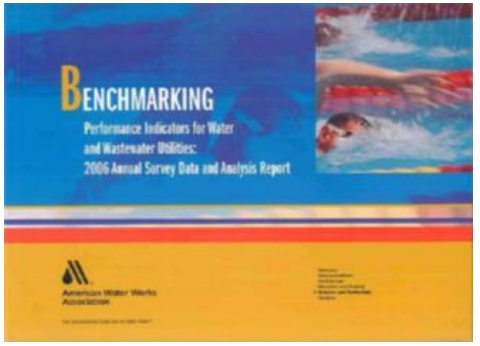
Risk Management Based on Likelihood and Consequence of Failure

CIP Using Life Cycle Cost, Business Cases and Prioritization

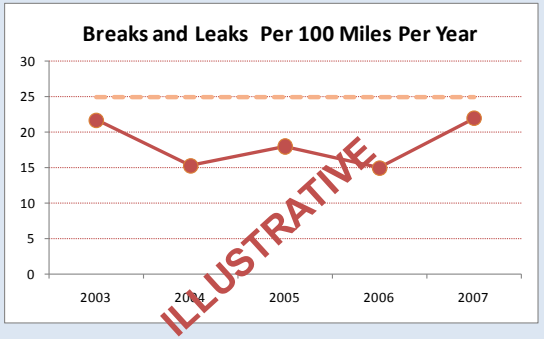
Leading Practice Asset Management

Service Levels Build Transparency and Stakeholder Relationships

SL Category	Water	Wastewater
Reliability	•water main breaks •unaccounted for water •worst served customers	•sewer blockages / collapses •SSOs / CSOs •spills / backups
Quality	• customer complaints (pressure, taste/odor, color)	•odor complaints from pump stations and WWTPs
Customer Service	•outage response •call center performance	•event response •call center performance
Regulatory	•water quality compliance	•discharge permit compliance



Water Distribution



Current Performance Trends and Issues

- Stable performance driven by rehabilitation and renewal program of 100 miles per year.
- Continued focus on oldest cast iron pipe and worst served areas.
- 2007 performance impacted by spike of 75 third party damage incidents during downtown light rail construction .

What is an asset?

The following three questions can be used as a guide in defining assets:

1. Will a work order be written to this specific item?
2. Will a separate condition assessment need to be performed on this item?
3. Will depreciation or costs need to be tracked separately on this item?

Leading Practice Asset Management Should Be Risk-Based

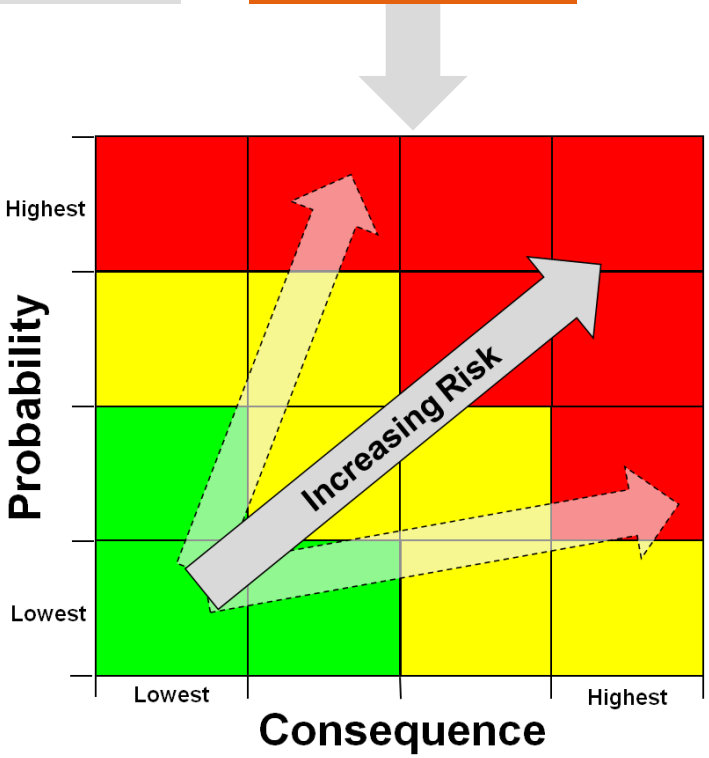
Probability x **Consequence** x **Redundancy/ Mitigation** = **Asset Risk Score**

Probability of Failure

- Based on asset condition and performance standards

Consequence of Failure

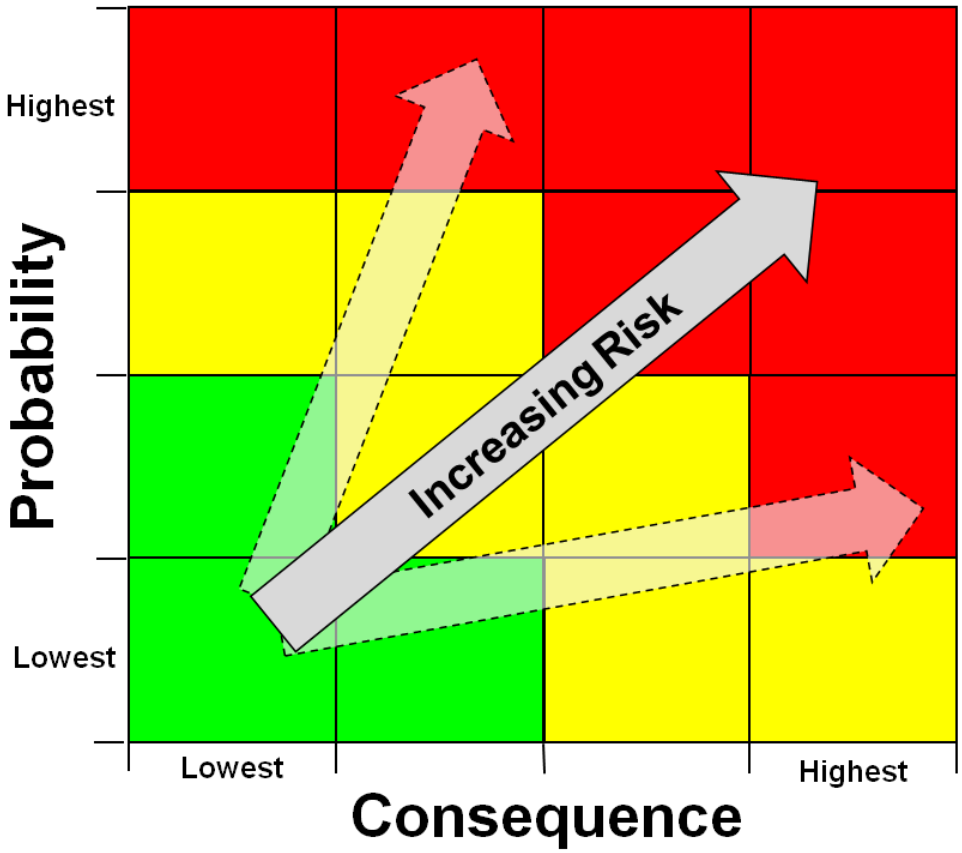
- Based on Triple Bottom Line principles:
  - Economic
  - Environmental
  - Social



Risk Calculation / Definition

EPA 10 Step RBAM

*R = Probability * Consequence*



J100 VA

$$R = C \times V \times T$$

Where:

C = Consequences

V = Vulnerability

T = Threat likelihood

What is the AWWA J100 Standard?

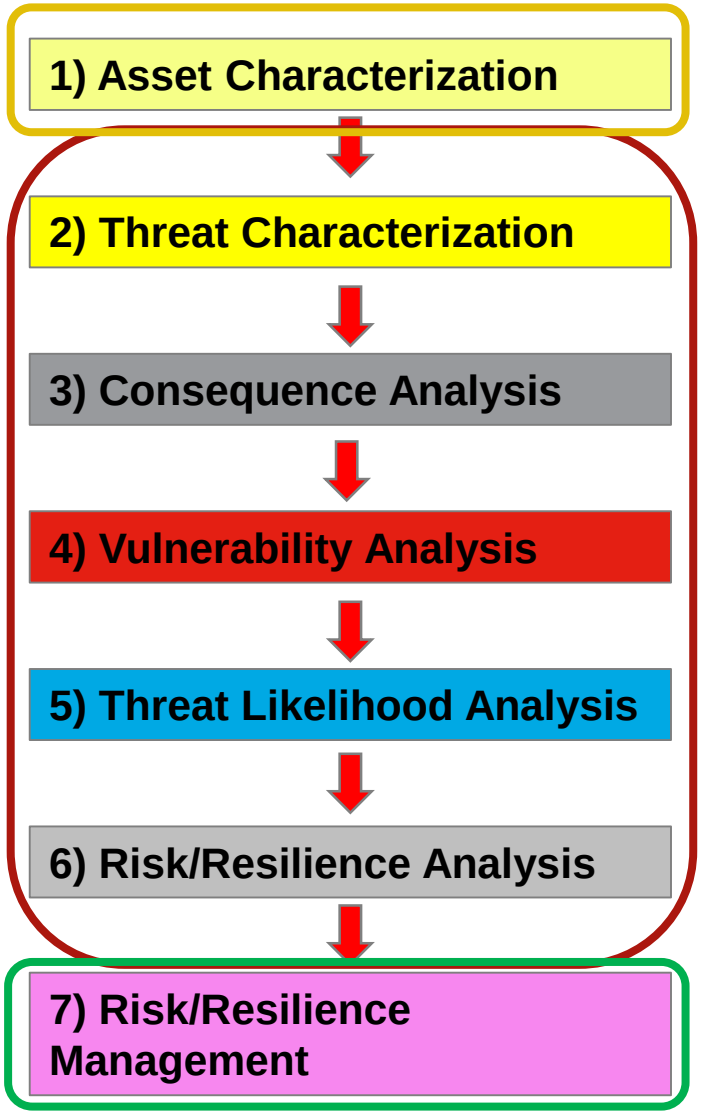
Methodology to quantify risk ($)

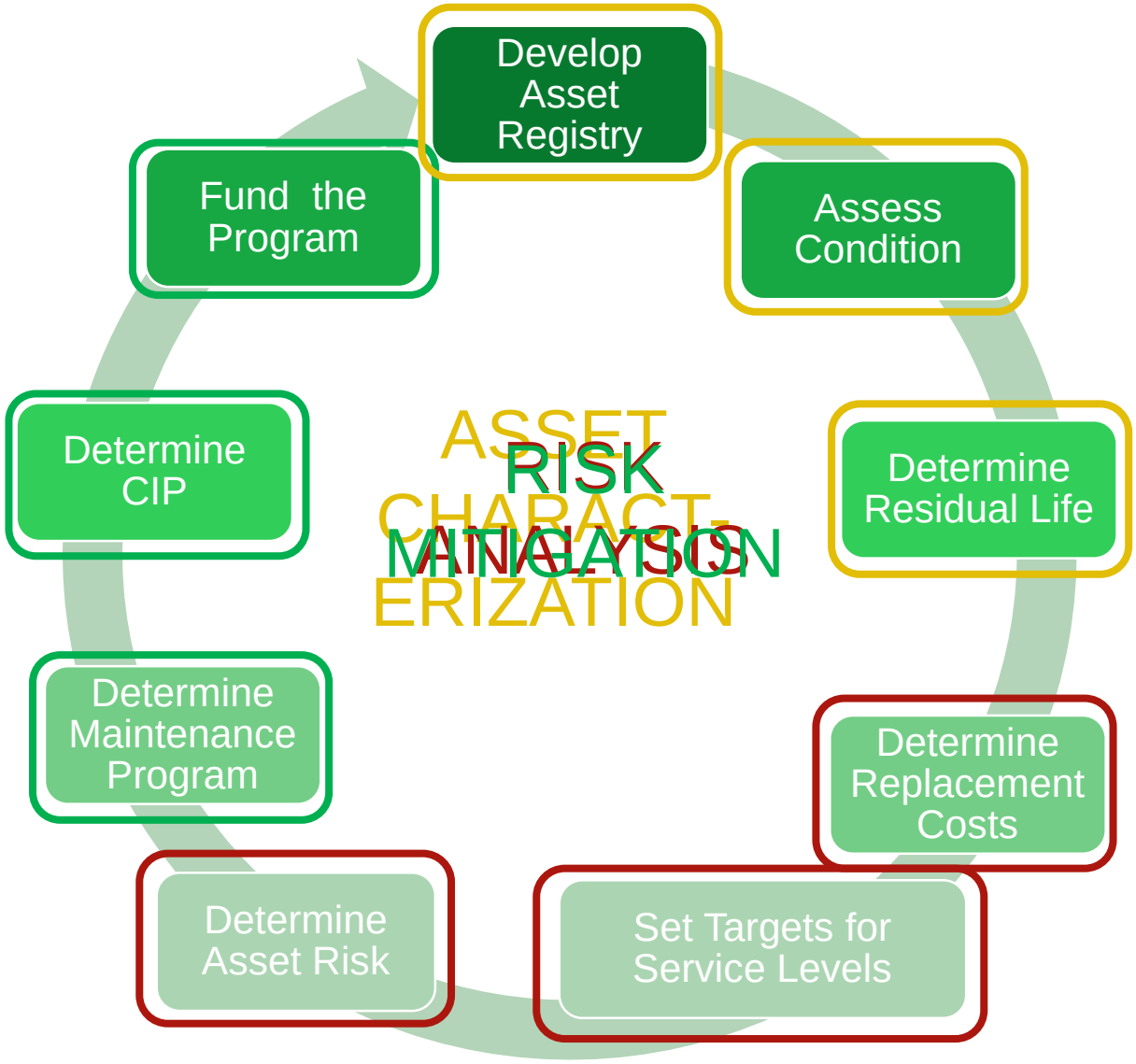
Down to the facility or asset level

Analyzes a broad range of threat types

A way to compare apples to oranges

J100 VA *OR* EPA 10 Step RBAM?





Risk Mitigation Measures (RMMs)

- Can a single project benefit multiple assets?
- Continuous process
- Emergency Preparedness / Contingency Planning

Emergency Preparedness Program?

- **P**lan: All-Hazards EOP & COG
- **O**rganize/**E**quip: Budget, Grants
- **T**rain: ICS & EOC
- **E**xercise: City, County, Regional, State
- **E**valuate: After-Action Reports

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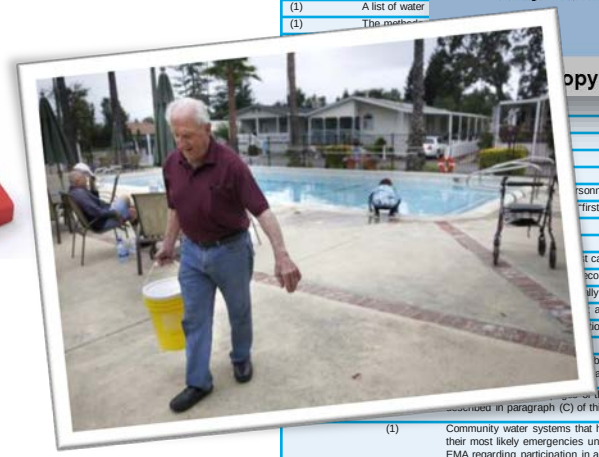
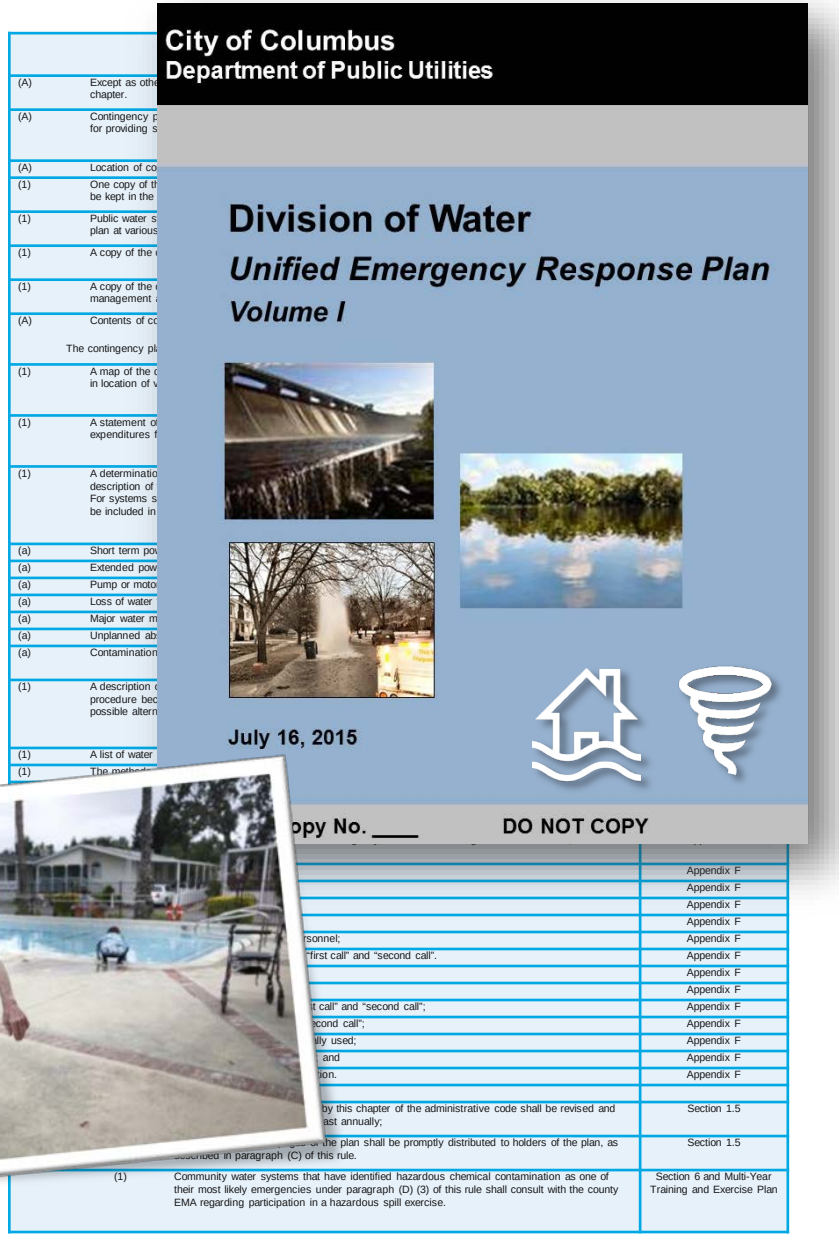
Contingency Plan Requirements

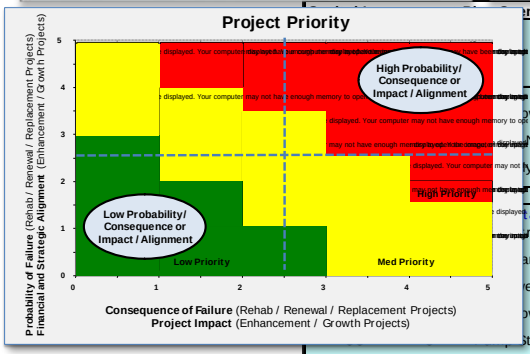
- OAC 3745-85-01
- Public Drinking Water Systems
- Identify response actions to:
  - Protect people
  - Preserve property
  - Protect the environment
  - Maintain operations & minimize disruption to the public





Steps to Bundle, Validate and Prioritize CIP

Assess and Analyze Asset Data and Establish Policies and Procedures	Conduct Risk Assessment	Develop 5/20 Year Capital Investment Plan (CIP)	Analyze and Review Financial and Rate Implications

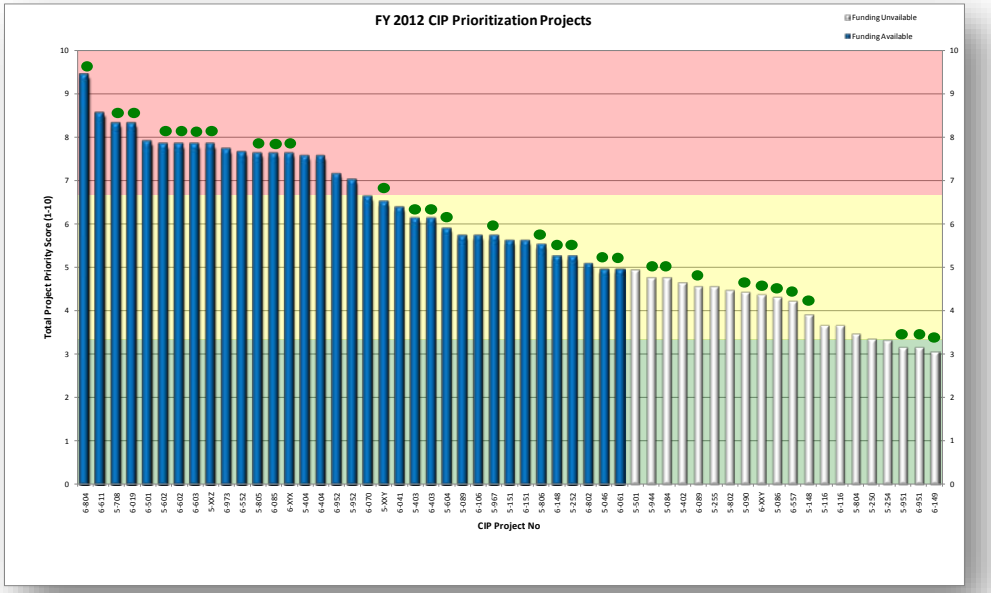


rview By Project Type 2007-2013 (Non-Escalated Costs)

		Project Name	Priority	Project Type	Estimated Annual Expenditure 2007	2008	2009	2010	Total
		owns Wet Well and ORF Improvements	High	Growth / Augmentation	$ -	$ 1,000,000	$ 4,600,000	$ 1,300,000	$ 7,900,000
		N/ Aurora S Pump Station Improvements	Med High	Growth / Renewal	$ -	$ -	$ -	$ -	$ 4,000,000
		y PS Replacement	Low	Growth	$ -	$ 200,000	$ 300,000	$ -	$ 500,000
					$ -	***$ 1,700,000***	***$ 5,300,000***	***$ 1,300,000***	***$ 13,300,000***
		tations							
		eet PS Improvements	High	Augmentation	$ 1,000,000	$ 4,000,000	$ -	$ -	$ 5,000,000
		and PS Improvements	High	Augmentation	$ 100,000	$ -	$ -	$ -	$ 1,900,000
		estern PS Elimination	Med High	Augmentation	$ -	$ -	$ -	$ -	$ 700,000
		owns Solids Handling	Med	Augmentation	$ -	$ 2,000,000	$ 4,000,000	$ 880,000	$ 6,880,000
		Station Elimination Evaluation (Greenmeadow)	Low	Augmentation	$ -	$ 580,000	$ -	$ -	$ 580,000
Augmentation - Collection System									
34	3	Rush Creek Interceptor	Med High	Augmentation	$ -	$ -	$ 4,000,000	$ 2,800,000	$ 10,300,000
Augmentation - Other									
61	All	CMMS Implementation	Med	Augmentation	$ 290,000	$ 1,145,000	$ 3,145,000	$ -	$ 4,580,000
TOTAL - AUGMENTATION					***$ 1,630,000***	***$ 9,295,000***	***$ 13,145,000***	***$ 6,580,000***	***$ 36,650,000***
Renewal / Rehabilitation / Replacement - Plant and Lift Stations									
3	1	Cayuga & Industrial Parkway HVAC	High	Renewal	$ -	$ 350,000	$ -	$ -	$ 350,000
40	6	Lackawanna STP Chlorine Building and Primary Tank Repairs	Med High	Renewal	$ -	$ 170,000	$ -	$ -	$ 170,000
63	3	Southtowns Roof Replacement	Med	Renewal	$ -	$ -	$ -	$ 1,400,000	$ 1,400,000
Renewal / Rehabilitation / Replacement - Collection System									
32	3	Village of Hamburg Collection System	High	Renewal	$ 592,000	$ 1,000,000	$ -	$ -	$ 1,592,000
10	5	Replacement of ACP along Transit Road*	High	Renewal	$ 500,000	$ 1,300,000	$ -	$ -	$ 1,800,000
44	6	Bethlehem Park PS and Collection System Improvements	High	Renewal	$ 250,000	$ 500,000	$ -	$ -	$ 750,000
64	6	Holland Avenue Sewer Replacement*	High	Renewal	$ 600,000	$ 200,000			$ 800,000
51	8	East Aurora Collection System Replacement NYS DOT	Low	Renewal	$ 2,000,000	$ -	$ -	$ -	$ 2,000,000
TOTAL - RENEWAL / REHABILITATION / REPLACEMENT					***$ 6,082,000***	***$ 6,620,000***	***$ 1,200,000***	***$ 1,400,000***	***$ 15,302,000***
Total - All Projects					**$ 7,712,000**	**$ 17,615,000**	**$ 19,645,000**	**$ 9,280,000**	**$ 65,252,000**

Projects Can Be Validated and Prioritized Through Defined Criteria

- Physical Condition
- Performance Condition
- Strategic Plan Alignment
- Regulatory/ Environmental
- Service Level/Reliability
- O&M and Safety
- Public Benefit
- Financial
- Efficiency/Energy
- Community/Growth



Sustainable Financial Projections

- Capital Prioritization
- Affordability Analysis
- Funding Options

Helps Balance Capital Funding and Rate Impacts

Shared Outcomes

- Projects vs. Integrated Program

Vulnerability Assessment	Asset Management Program
Security Projects	Maintenance Program
Emergency Response Plans	Accelerated Capital Investment
Asset Hardening	Integrated with Operations
Capital Funding	Capital and Operations Funding
Risk Mitigation Contingency Plan	

Questions?

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