



AM LEADING PRACTICES

& Lessons Learned on Capital Planning

CWEA Webinar
June 23, 2016

Webinar Speakers



CRAIG DALY

Pure Technologies, Chair, Chesapeake AWWA



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Arcadis



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Presentation Agenda

Asset Management Leading Practices & Lessons Learned on Capital Planning

1:00 – 1:05	Welcome from the Committee Vice Chair and Introductions (Craig Daly)
1:05 - 1:20	Overview of Leading Practices in the U.S. (Linda Blankenship)
1:20 – 1:40	Approaches and Tools for Capital Planning and Prioritization (Kevin Slaven)
1:40 – 1:50	Case Study Examples
1:50 - 2:00	Q&A, Wrap-up

Your Presenters



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Utility and Asset Management Leader

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KEVIN SLAVEN, CRL

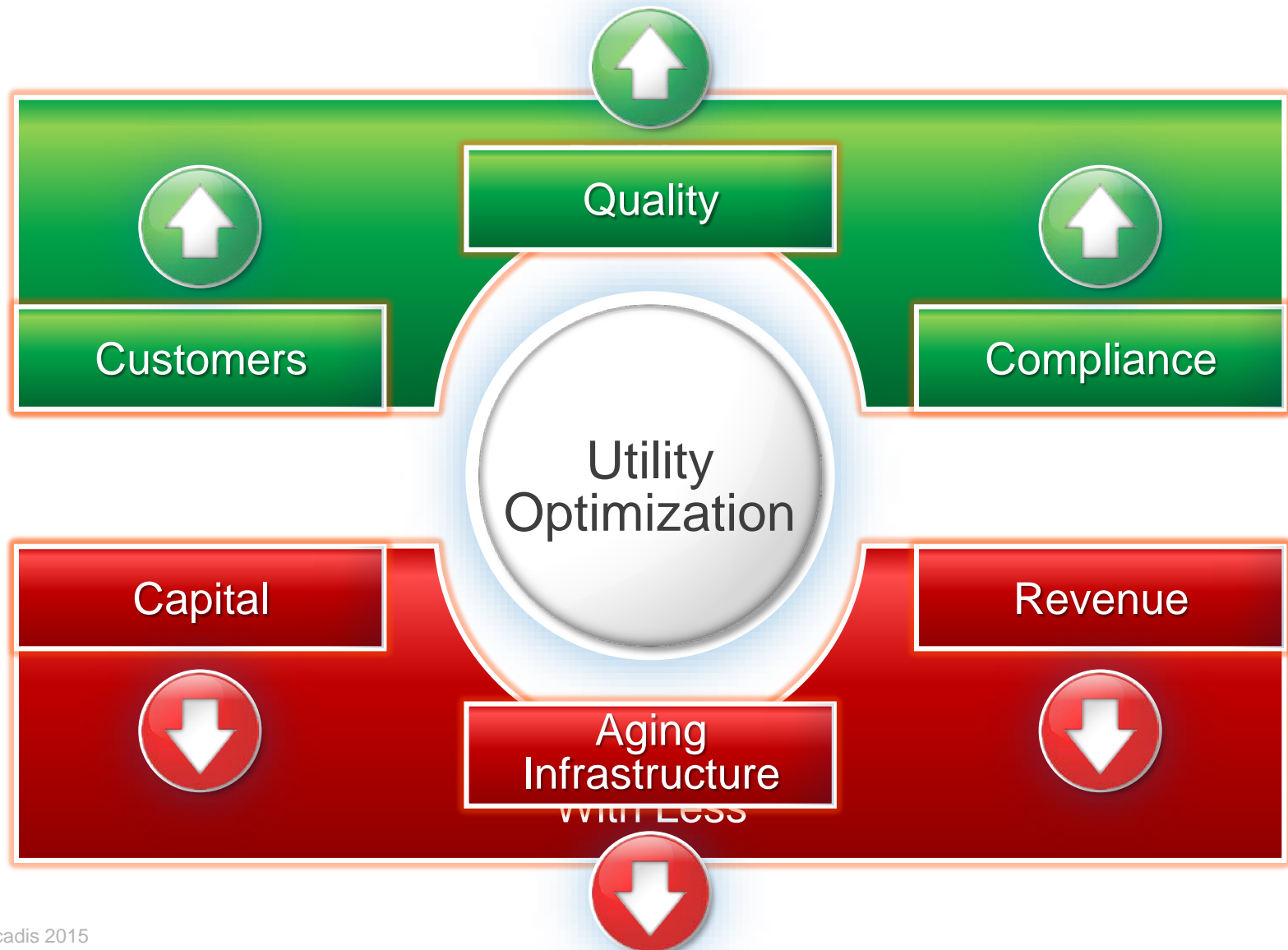
Senior Asset Management Consultant

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c 330-990-2726

e Kevin.Slaven@arcadis.com

Utility Economic and Political Environment



Typical Drivers in the US are Evolving...



Capital Budgets

- “Wish list”
- Unaffordable
- Regulatory requirements



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 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**



WERF Convened International Research Agenda Setting Meeting in 2002

UK, Australia, NZ, Canada presentations

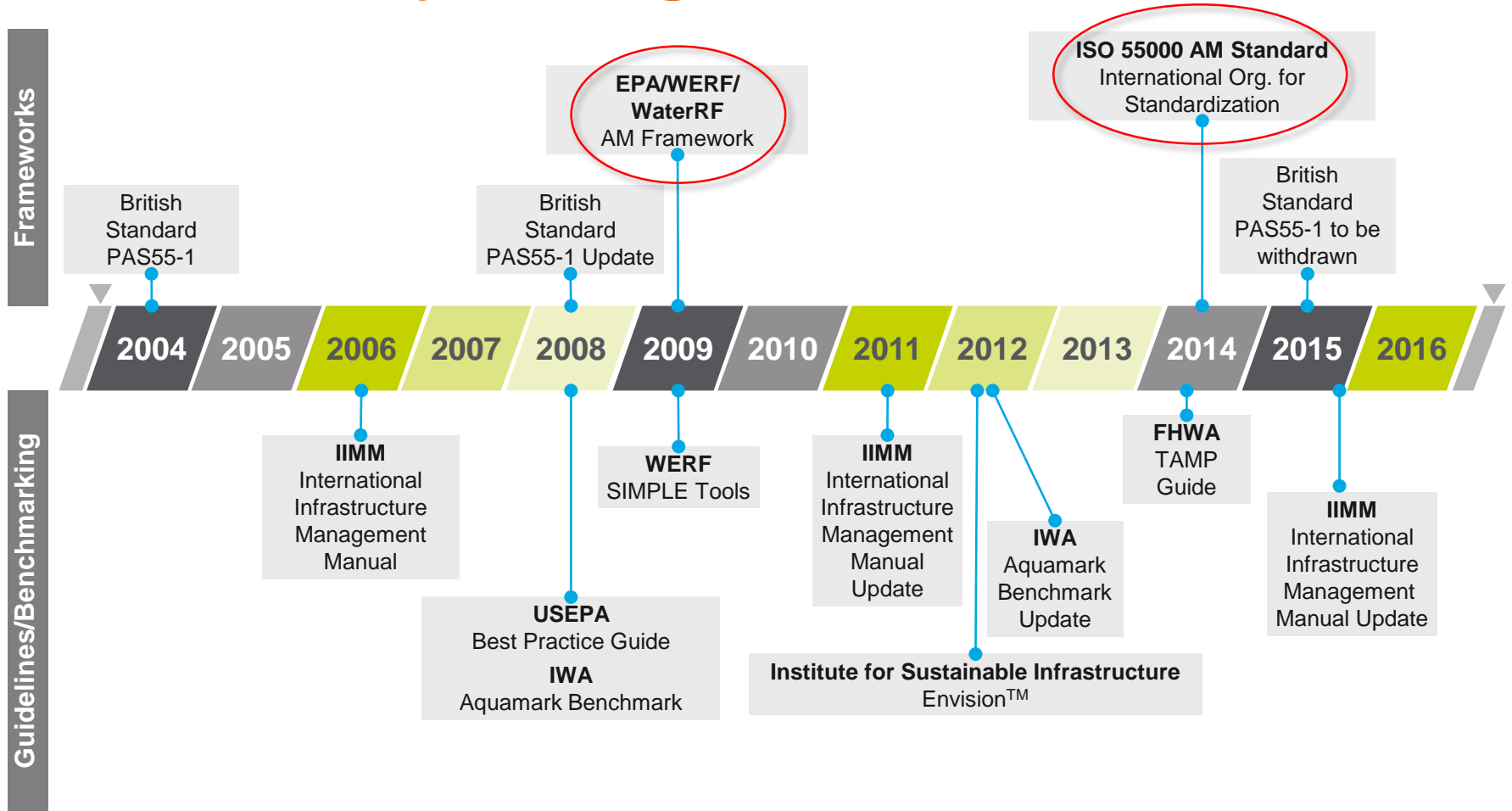
- New elements of risk, levels of service, business cases

Laid out a recommended research agenda

- Protocols for condition assessment and asset life
- Life cycle models and methods
- Plan guidance and templates
- Case studies
- Asset value methodologies



Asset Management Evolution: Two Widely Recognized Frameworks



Introduction to Best Practices

ISO 55000 – “what” a program requires

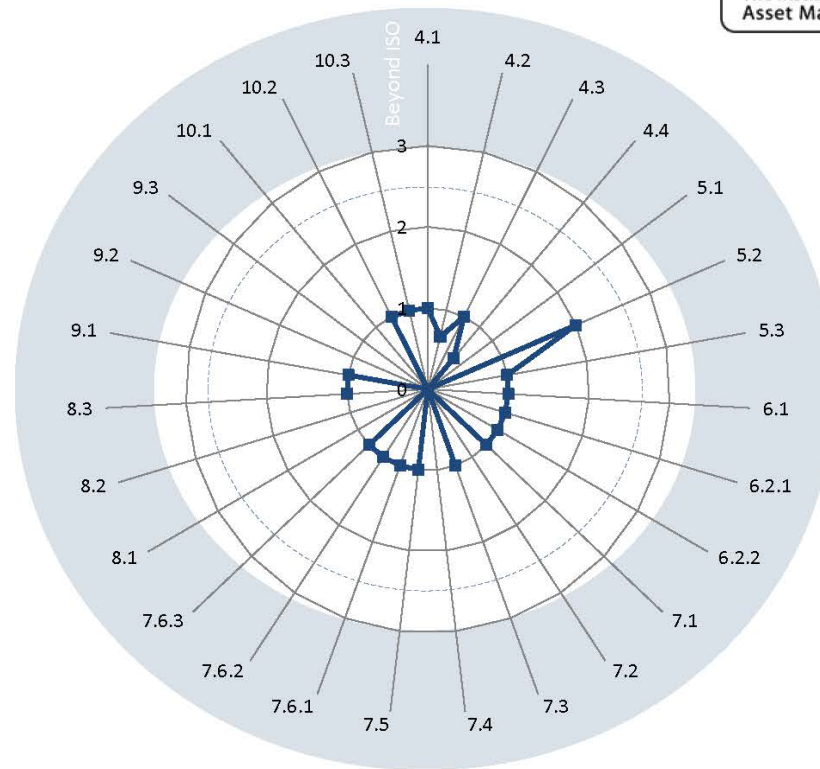
- A management system standard, like others you may be familiar with such as ISO 9001, ISO 14001, etc.
 - ISO 55000 – Overview, Principles and Terminology
 - ISO 55001 – Requirements
 - ISO 55002 – Guidelines



ISO 55000 Maturity Assessment Has 39 Questions

No	Clause
4.1	Understanding the organization and its context
4.2	Understanding the needs and expectations of stakeholders
4.3	Determining the scope of the asset management system
4.4	Asset management system
5.1	Leadership and commitment
5.2	Policy
5.3	Organizational roles, responsibilities and authorities
6.1	Actions to address risks and opportunities for the asset management system
6.2.1	Asset management objectives
6.2.2	Planning to achieve asset management objectives
7.1	Resources
7.2	Competence
7.3	Awareness
7.4	Communication
7.5	Information requirements
7.6.1	Documented information general
7.6.2	Creating and updating documented information
7.6.3	Control of documented information
8.1	Operational planning and control
8.2	Management of change
8.3	Outsourcing
9.1	Monitoring, measurement, analysis and evaluation
9.2	Internal audit
9.3	Management review
10.1	Nonconformity and corrective action
10.2	Preventive action
10.3	Continual improvement

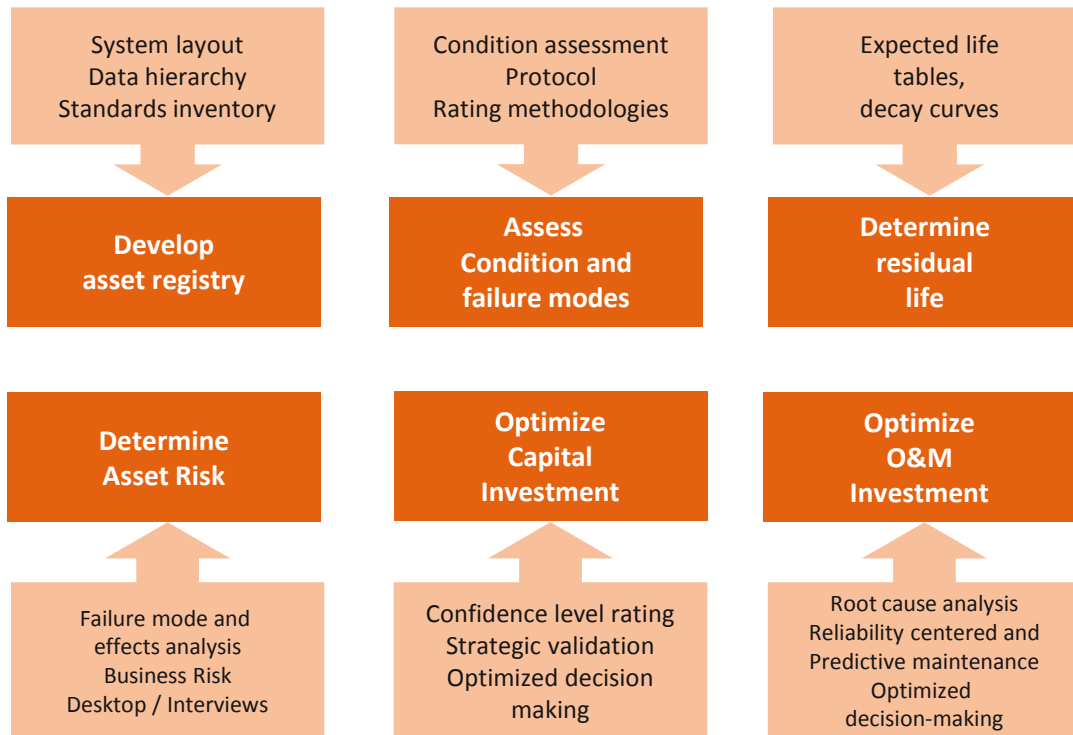
The Radar chart shows the average score range per clause.



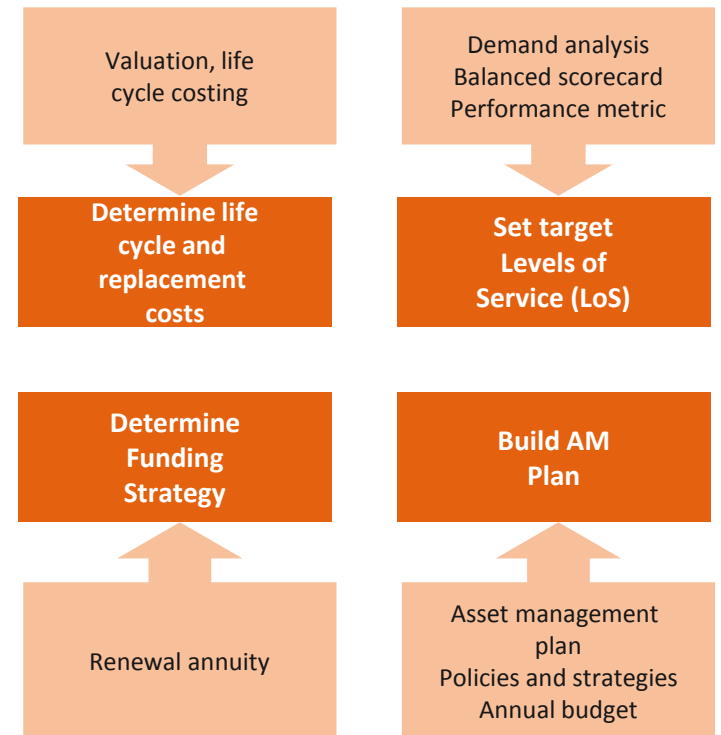
Note that Clauses 1 through 3, namely Clause 1 – Scope, Clause 2 – Normative references and Clause 3 – Terms and Definitions are not used for an ISO 55000 gap assessment.)

EPA / WERF/ WaterRF Framework

1. What is the current state of my assets?



2. What is the required LOS?

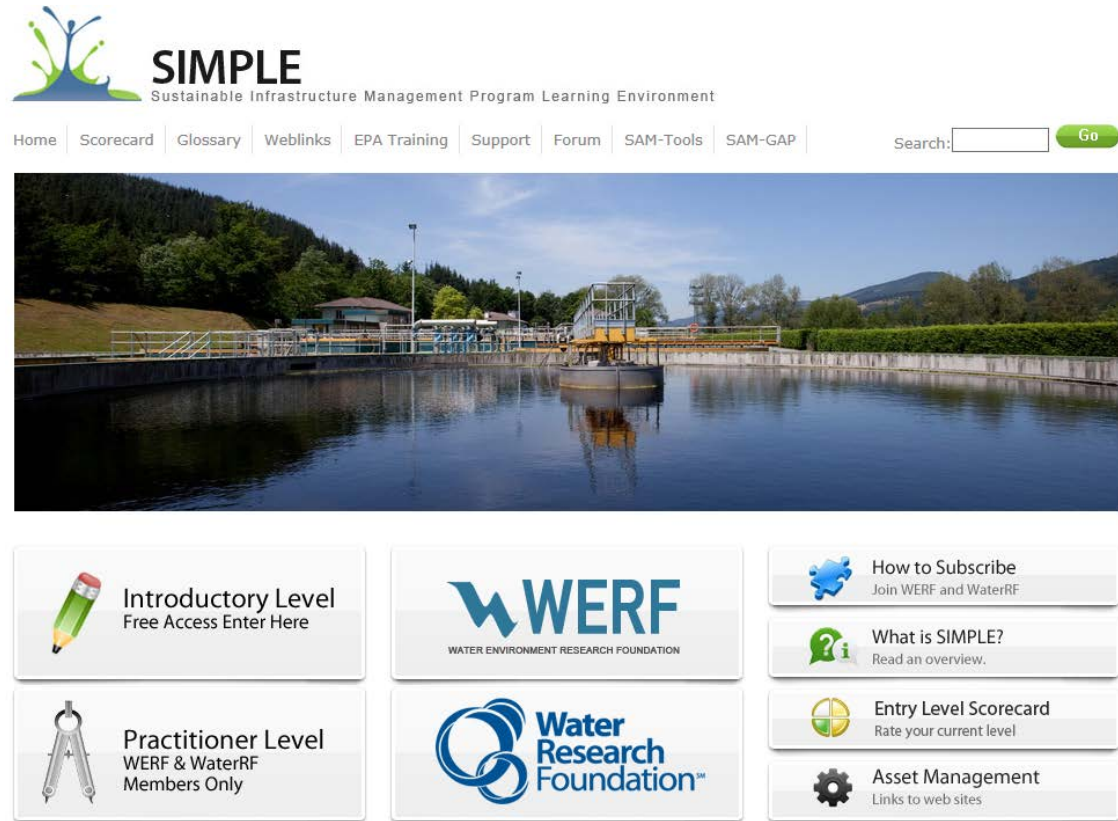


3. Which assets are critical?

4. What are my best CIP and O&M strategies?

5. What is my best funding strategy?

WERF's SIMPLE Knowledge Base Provides Extensive Tools Including SAM GAP



The screenshot shows the homepage of the SIMPLE (Sustainable Infrastructure Management Program Learning Environment) website. At the top left is the SIMPLE logo, which consists of a stylized green and blue figure with arms raised, next to the text 'SIMPLE' and 'Sustainable Infrastructure Management Program Learning Environment'. Below the logo is a navigation menu with links for Home, Scorecard, Glossary, Weblinks, EPA Training, Support, Forum, SAM-Tools, and SAM-GAP. To the right of the menu is a search bar with a 'Go' button. Below the navigation is a large photograph of a wastewater treatment plant with several circular tanks and buildings. Below the photo is a grid of six buttons: 'Introductory Level Free Access Enter Here' (with a pencil icon), 'Practitioner Level WERF & WaterRF Members Only' (with a compass icon), 'How to Subscribe Join WERF and WaterRF' (with a puzzle piece icon), 'What is SIMPLE? Read an overview.' (with a question mark icon), 'Entry Level Scorecard Rate your current level' (with a target icon), and 'Asset Management Links to web sites' (with a gear icon). In the center of the grid are two logos: the WERF (Water Environment Research Foundation) logo and the Water Research Foundation logo.

WERF SAM-GAP Has 150 Statements

The **SAM-GAP** assessment tool takes the form of a detailed and comprehensive multiple-choice questionnaire.

SAM-GAP Examine the situation, Expose the problems, Execute the improvements.

Main Help Change Password Logout

1 Processes and Practices

Asset management is ultimately about the effective management of the entire life cycle of an asset – more fundamentally, which practices are most cost effective to apply at what point in that life cycle. Processes and practices must be in place that supports decision-making throughout all stages of an asset's life cycle.

Processes and Practices Information Systems Data and Knowledge Service Delivery Organizational Issues People Issues Asset Management Plans

1.10 Maintenance

The asset maintenance approach is to establish the right balance of preventive, predictive, and reactive maintenance, implement improved maintenance and operational procedures and improve work planning and scheduling. The aim of maintaining assets are to meet service delivery performance requirements, control fixed plant, equipment and component aging and optimize the entire asset life cycle costs

1.01 1.02 1.03 1.04 1.05 1.06 1.07 1.08 1.09 **1.10** 1.11 1.12

Legend: ■ Current Item ■ Uncompleted Item ■ Completed Item ■ Unanswered Question

To what extent and at what level do processes exist for: Save and Next >

1.10.01 Processes for setting a strategic level maintenance framework (such as Reliability Centered Maintenance, Zero Breakdown Maintenance, Six Sigma, etc.) that defines how the organization undertakes maintenance of its assets.(eg. Does such a corporate wide policy exist and is it tied to business goals and cost analysis?)

Level of practice
○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5
0 = "Innocence",
1 = Aware but no practice,
2 = Low practice level,
3 = Modest practice level,
4 = Substantial practice level,
5 = "World class" practice level

Extent of practice
○ 0 ○ 1 ○ 2 ○ 3 ○ 4 ○ 5
0 = Never done,
1 = Ad hoc process rarely executed,
2 = Ad hoc process occasionally executed,
3 = Mixture of ad hoc and systematic process, partially documented,
4 = Mostly systematic process, pretty well documented, and regularly executed,
5 = Systematic, fully documented process, always executed

SIMPLE Tools Address Breadth of Asset Management Topics



SIMPLE

Sustainable Infrastructure Management Program Learning Environment

[Home](#) | [Scorecard](#) | [Glossary](#) | [Weblinks](#) | [EPA Training](#) | [Support](#) | [Forum](#) | [SAM-Tools](#) | [SAM-GAP](#)

Search: [Go](#)

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Introductory Contents

- [How to Subscribe](#)
- [How Can Asset Management Help Me?](#)
- ⊕ [Project Background](#)
- ⊕ [How to use SIMPLE](#)
- ⊕ [What is SIMPLE?](#)
- ⊕ [Getting Started](#)

Contents

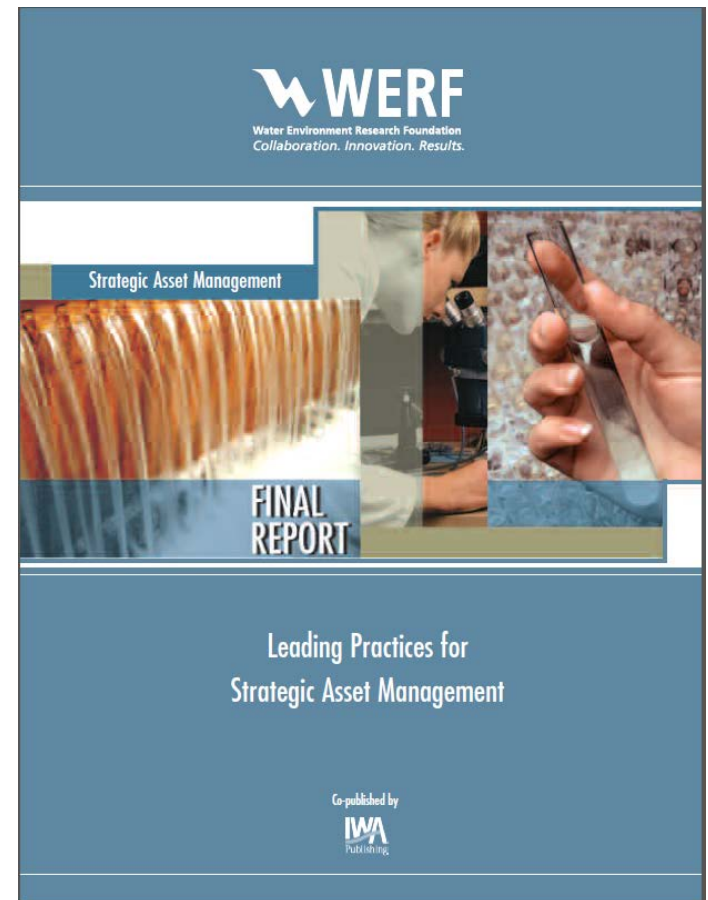
This topic covers the following areas:

- [Asset Hierarchal Tool](#)
- [Condition Assessment Tool](#)
- [Remaining Effective Life Tool](#)
- [Life Cycle Costing Tool](#)
- [Level Of Service Tool](#)
- [Business Risk Exposure Tool](#)
- [Benefit Cost Tool](#)
- [End of Asset Life Tool](#)
- [Business Case Tool](#)
- [Capital Investment Validation and Prioritization Tool](#)
- [Asset Management Plan Tool](#)
- [SAM-GAP, Asset Management Assessment Tool](#)

WERF Report Benchmarked 36 Utilities to Identify Leading Practices

For strategic asset capital planning:

- Predicting likely failure modes
- Life-cycle cost-based optimized decision making (repair, rehab, replace)
- State-of-the-asset portfolio reporting (long term view)



Best in Class Programs Use a Blended Approach

ISO 55000

The Organization
Leadership
Plans
Support
Operation
Performance Evaluation
Improvement

AM Success

WERF SAM GAP

Processes & Practices
Information Systems
Data & Knowledge
Service Delivery
Organization Issues
People Issues
Asset Mgmt. Plans



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

+

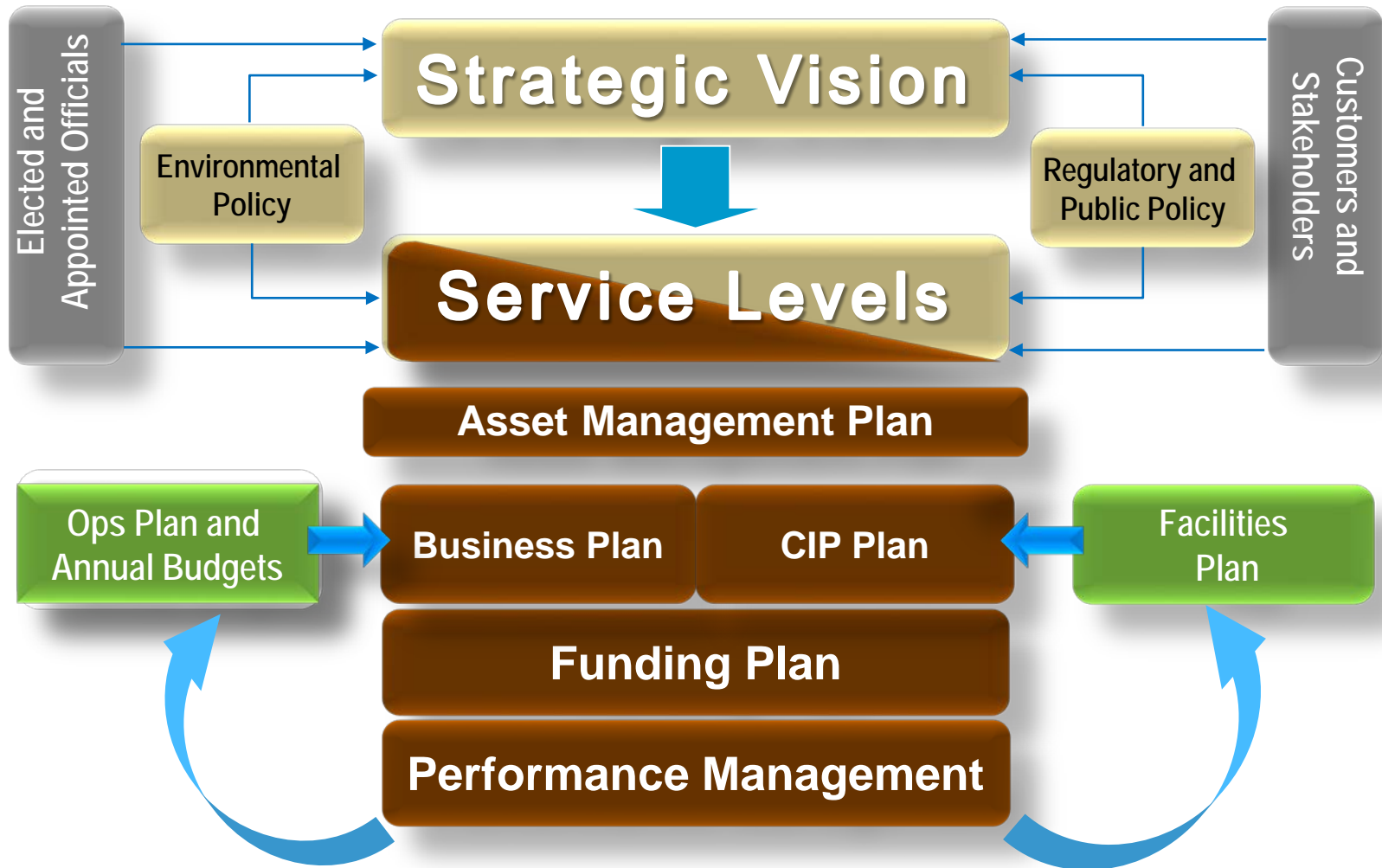


CIP Using Life Cycle Cost, Business Cases and Prioritization

=

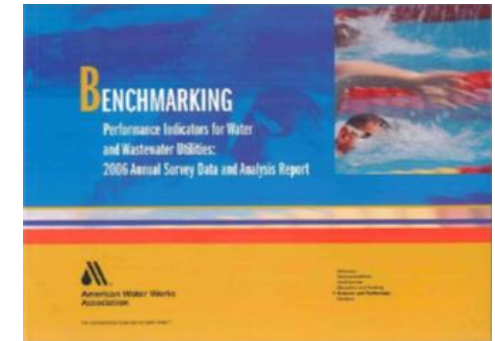
Leading Practice Asset Management

Leading Practice Asset Management Should Align with Overall Organization Strategy

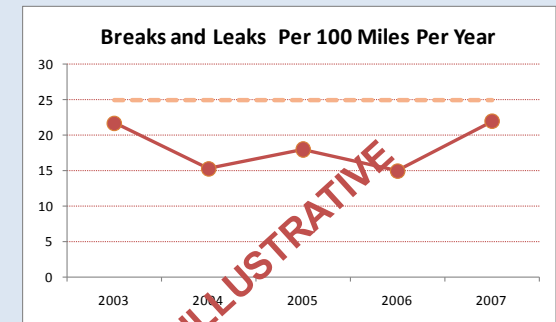


Service Levels Build Transparency and Stakeholder Relationships

SL Category	Water	Wastewater
Reliability	<ul style="list-style-type: none"> •water main breaks •unaccounted for water •worst served customers 	<ul style="list-style-type: none"> •sewer blockages / collapses •SSOs / CSOs •spills / backups
Quality	<ul style="list-style-type: none"> • customer complaints (pressure, taste/odor, color) 	<ul style="list-style-type: none"> •odor complaints from pump stations and WWTPs
Customer Service	<ul style="list-style-type: none"> •outage response •call center performance 	<ul style="list-style-type: none"> •event response •call center performance
Regulatory	<ul style="list-style-type: none"> •water quality compliance 	<ul style="list-style-type: none"> •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 .

Leading Practice Asset Management Should Be Risk-Based

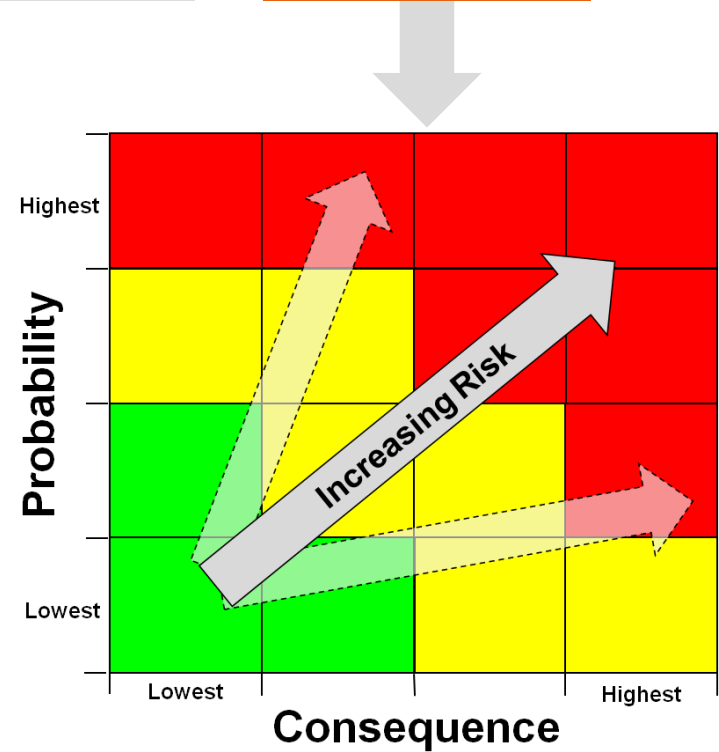
$$\text{Probability} \times \text{Consequence} \times \text{Redundancy/Mitigation} = \text{Asset Risk Score}$$

Probability of Failure

- Based on asset condition and performance standards

Consequence of Failure

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



IIMM Provides Concepts for Standardized Condition Scoring

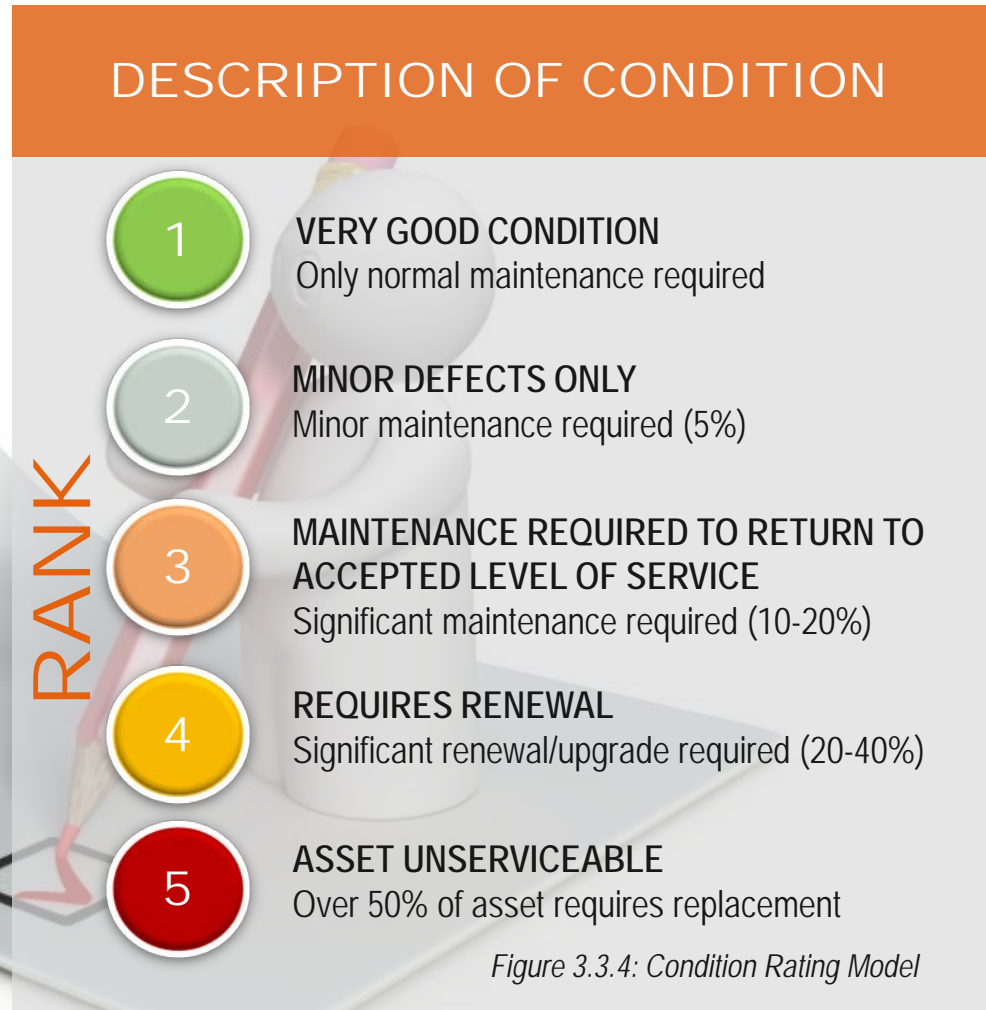
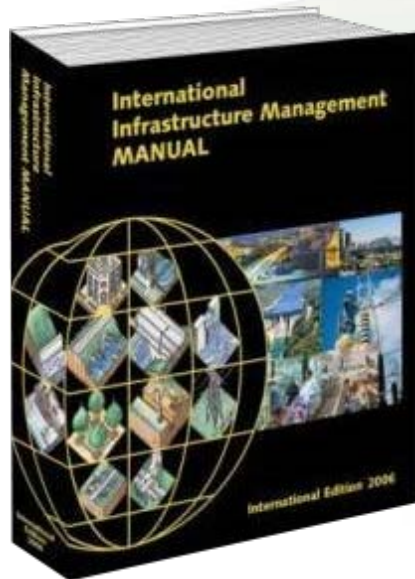




Figure 3.3.4: Condition Rating Model

Risk-Based Approach and CIP Planning Evaluates All Potential Failure Modes

Condition Type	Failure Mode	Description	Typical Assessment Method
Performance 	Capacity	Does not meet demand (flow, loading, storage volume, etc.)	Test or Desktop
	Level of Service	Does not meet functional needs (permits, levels of service)	Desktop
	Efficiency	Not lowest cost alternative (chemicals, power, labor, availability, obsolescence)	Desktop
Physical 	Mortality	Current state of repair and operation as influenced by age, historical maintenance and operating environment	Test, Visual, Desktop

Leading Practice Capital Planning Uses a Business Case Evaluation

Virginia Beach DPU

Capital Project Business Case

Project Name Upgrade of ~~leachpools~~ at the Waterway Estates WWTP

Project Summary Information

Project ID / Reference Number/WWES	Date Prepared: April 8, 2008
Project Owner / Sponsor: JCU	Name: Ivan Velazquez, P.E.
Title:	Prepared By: Malcolm Pirnie, Inc.

Primary Focus

<input checked="" type="checkbox"/> WWTP	<input type="checkbox"/> Wastewater PS	<input type="checkbox"/> Collection	<input type="checkbox"/> (Other) _____
<input type="checkbox"/> WTP	<input type="checkbox"/> Water PS	<input type="checkbox"/> Distribution	<input type="checkbox"/> (Other) _____

List of Assets Involved:
Waterway Estates WWTP -

- Bar Screen (Asset ID 118)
- Oil Removal System (new system)

Project Category

<input checked="" type="checkbox"/> Renewal/Rehabilitation/Replacement	<input type="checkbox"/> Growth
<input type="checkbox"/> Regulatory Compliance	<input checked="" type="checkbox"/> Service Level / Enhancement
<input type="checkbox"/> Other: _____	

Projected Project Schedule

	Start Date (MM/YYYY)	Finish Date (MM/YYYY)
Phase 1 - Project Development	01/2010	03/2010
Phase 2 - Procurement / Consultant Selection	05/2010	06/2010
Phase 3 - Design / Permitting / Acquisition	07/2010	11/2010
Phase 4 - Construction Bidding / Award	01/2011	03/2011
Phase 5 - Construction / Commissioning / Handover	04/2011	01/2012

Typical Business Case Evaluation Approach

- Project need (broadly stated)
- Evaluation of alternatives and life cycle costs
- Recommended project
- Evaluation of various criteria as needed

CIP Plan

- Prioritize CIP funding based on validated projects
- Use criteria based on risk and other important factors (economic, environmental and social)

Project Level Business Cases Can Consider a Broad Range of Factors

Virginia Beach DPU

Capital Project Business Case

Virginia Beach DPU

Capital Project Business Case

Project Name Upgrade of ~~Assets~~ at the Waterway Estates WWTP

Project Summary Information

Project ID / Reference Number: WWS	Date Prepared: April 8, 2009
Project Owner / Sponsor: DCU	Prepared By: Malcolm Pirnie, Inc.

WWTP Wastewater PS Collection (Other) _____
 WTP Water PS Distribution (Other) _____

List of Assets Involved:
Waterway Estates WWTP -

- San Screen (Asset ID 116)
- Grit Removal System (new system)

Project Category

<input checked="" type="checkbox"/> Renovation/Rehabilitation/Replacement	<input type="checkbox"/> Growth
<input type="checkbox"/> Regulatory Compliance	<input checked="" type="checkbox"/> Service Level / Enhancement
<input type="checkbox"/> Other: _____	

Projected Project Schedule

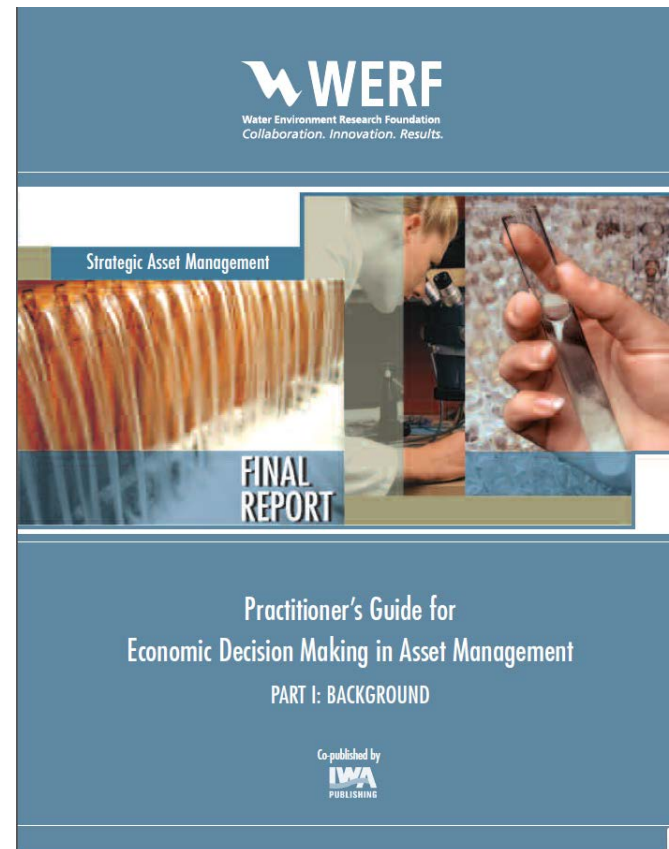
	Start Date (MM/YYYY)	Finish Date (MM/YYYY)
Phase 1 - Project Development	01/2010	02/2010
Phase 2 - Procurement / Consultant Selection	03/2010	06/2010
Phase 3 - Design / Permitting / Acquisition	07/2010	12/2010
Phase 4 - Construction Bidding / Award	01/2011	05/2011
Phase 5 - Construction / Commissioning / Handover	04/2011	01/2012

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

Life Cycle Cost Analysis Can Be a Challenge

WERF report provides guidance on:

- Quantifying benefits
- Comparing alternatives
- Selecting a discount rates



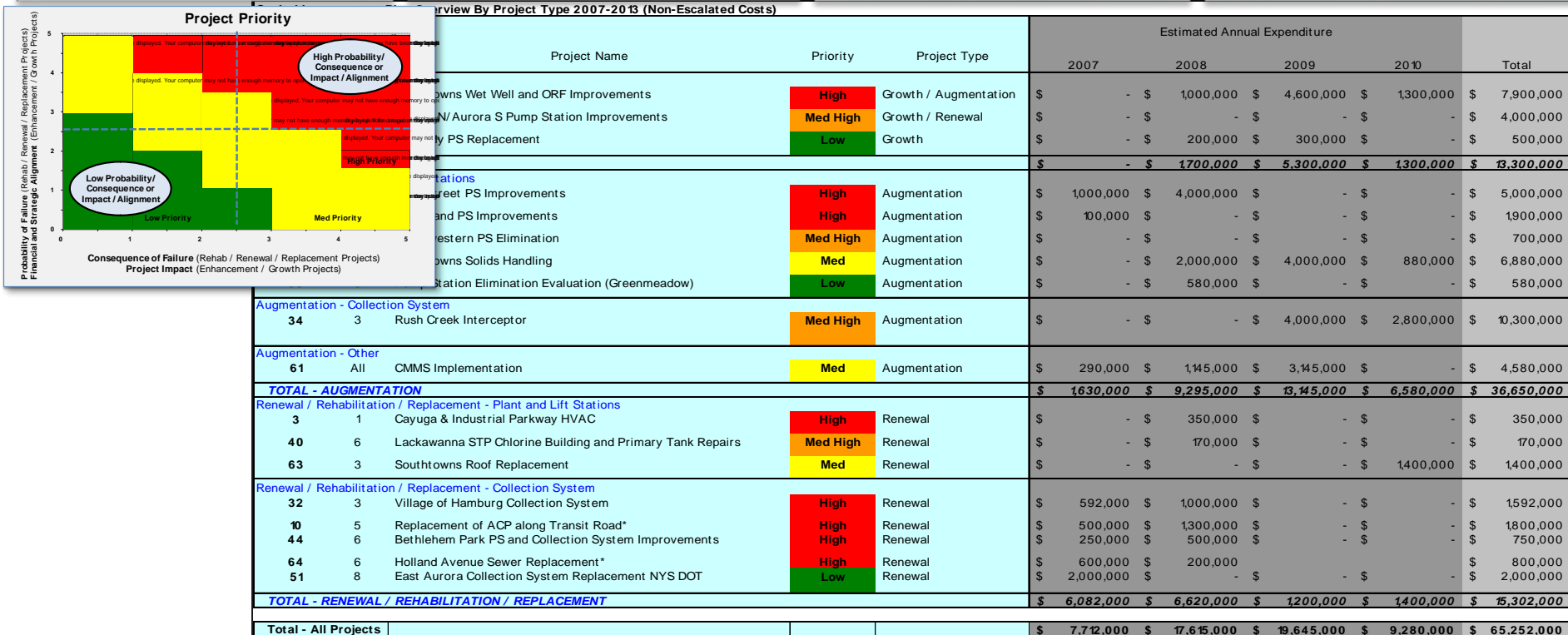
Steps to Bundle, Validate and Prioritize CIP

Assess and Analyze Asset Data and Establish Policies and Procedures

Conduct Asset Inventory and Condition Assessment

Develop 5/20 Year Capital Investment Plan (CIP)

Analyze and Review Financial and Rate Implications



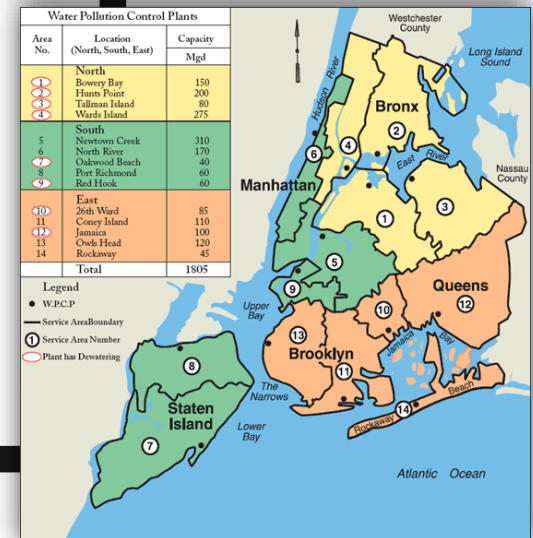
Case Study 1, NYC DEP

How It Got Started

- ✓ Wanted to make decisions based on data and be a “data-driven” organization
- ✓ Wanted to develop a risk-based CIP

Resulting Benefits

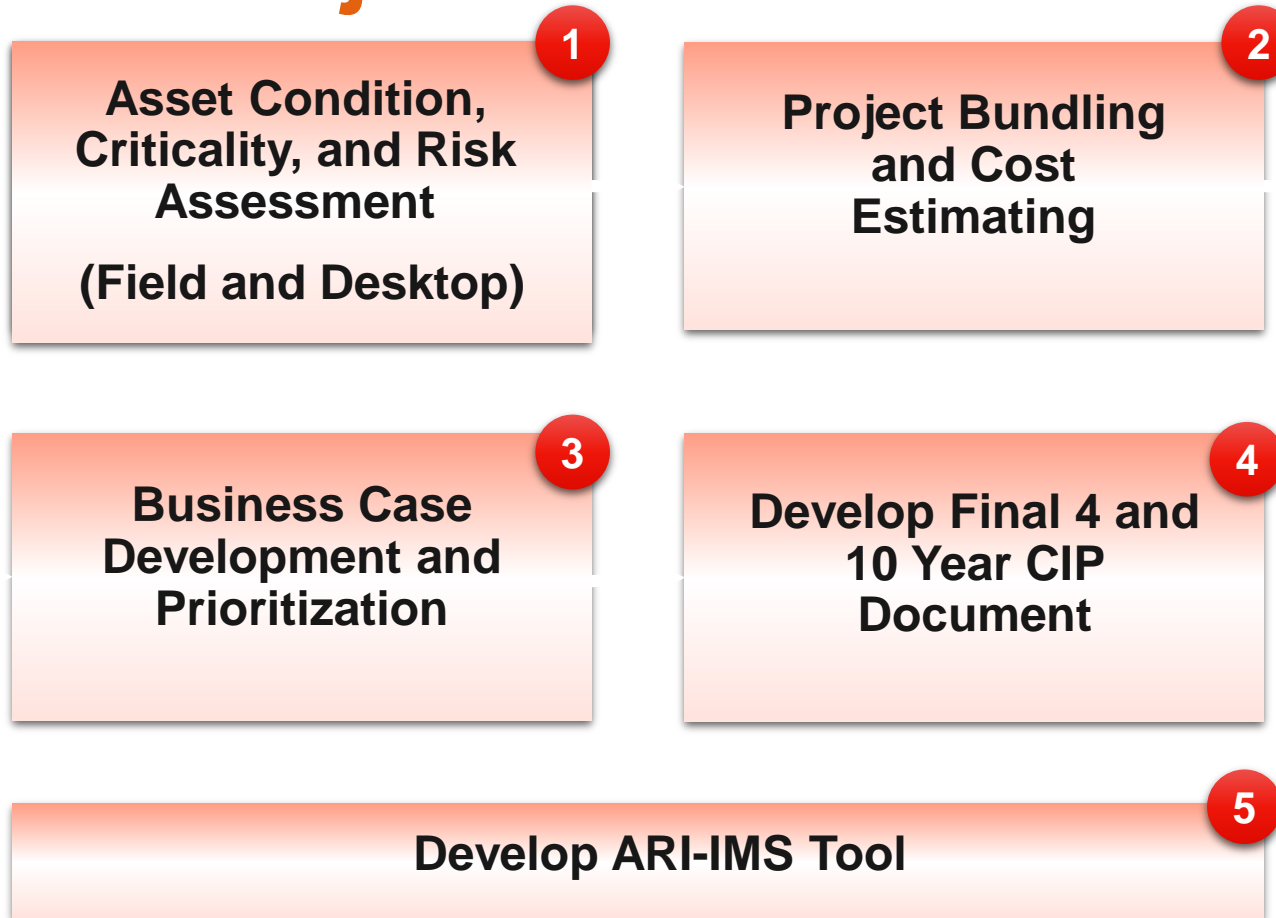
- ✓ Developed data management tools
- ✓ Project bundling and cost estimating
- ✓ Capital planning with project prioritization of validated project



DEP's Goals for the Overall Project in Phase I

- Update the DEP's 4 and 10-year Capital Improvement Program by fall of 2010
- Define consistent risk methodologies, tools, and practices
- Provide a transparent and objective approach for stakeholders and gain acceptance
- Employ systematic approach to condition assessment, project bundling and cost estimating

Overall Project Workflow in Phase I



Well-Document Guidelines for Vertical Assets Customized for DEP

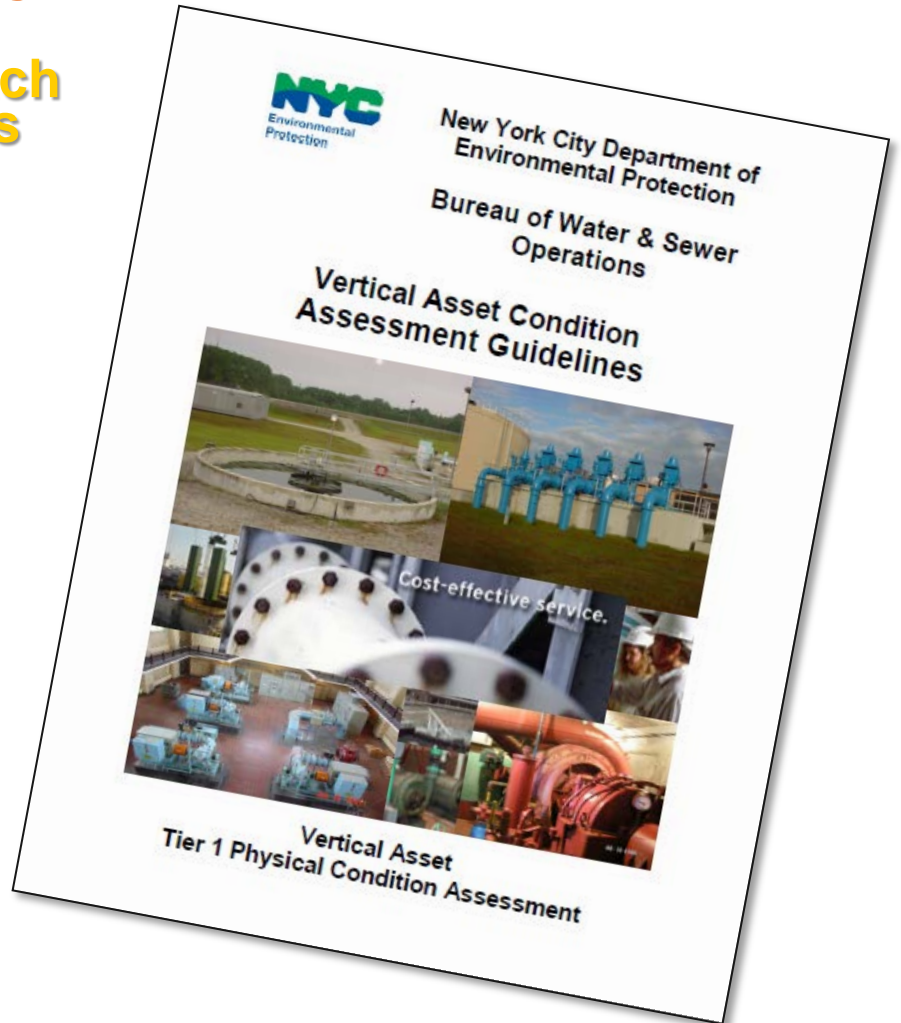
Guide Documents Created for Each Bureau Including Desktop Guides

Outlines Physical, Performance and Criticality criteria and scoring

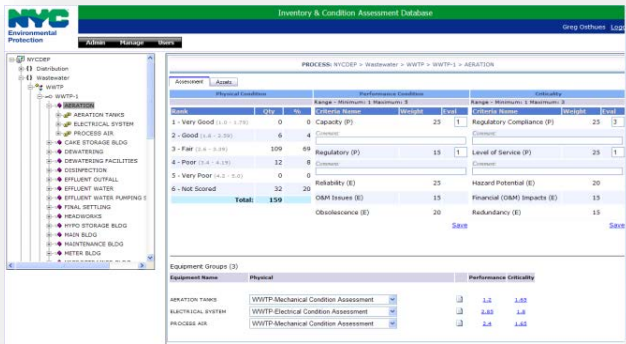
Sample Interview Questionnaires and list of documents to review

Photos for physical condition of each score

Allows for repeatable process and future DEP staff participation



Risk Tool to Analyze Data, Score Asset Risk and Bundle Projects



Custom Risk Tool Interface

- Maintains the asset hierarchy and data for each Bureau: 50,000+ assets
- Manages all field data on physical and performance condition and criticality
- Applies the “business rules” to calculate risk
- Recommends “project bundles” for each Facility in the hierarchy
- Manages the Business Cases for all proposed projects
- Creates the final CIP



Facility Asset Risk Profile

Example Business Case and Sections

Full Business Case Includes:

1. Project Summary
2. Project Scope and Drivers
3. Project Cost Accuracy
4. Project Schedule & Cost
5. Project Justification
6. Project Constraints
7. Condition, Consequence of Failure and Risk Analysis
8. Project Scoring

NYC Environmental Protection		Capital Project Business Case Summary	
Project Name		Tunnel Shaft Rehabilitation	
1. Project Summary Information			
Project ID / Reference Number:	BWSO 2	Date Business Case Prepared: 8/2/10	
DEP Bureau:	<input type="checkbox"/> BWS <input type="checkbox"/> BWT <input checked="" type="checkbox"/> BWSO <input type="checkbox"/> BEDC <input type="checkbox"/> Other _____		
DEP Managing Bureau:	<input type="checkbox"/> BWS <input type="checkbox"/> BWT <input checked="" type="checkbox"/> BWSO <input type="checkbox"/> BEDC <input type="checkbox"/> Other _____		
Project Estimated Start Date (FY)		Project Estimated Duration (Months)	72
Estimated Total Project Cost (\$)	\$5,267	Project Score	
2. Project Scope and Project Driver			
Indicate the primary asset focus/scope of the project by PMS category (check one that best applies)			
<input type="checkbox"/> WTP	<input type="checkbox"/> Pump Stations	<input checked="" type="checkbox"/> Distribution	<input type="checkbox"/> Reservoirs
<input type="checkbox"/> WPCP/STP	<input type="checkbox"/> Lift Stations	<input type="checkbox"/> Collection	<input type="checkbox"/> Dams
<input type="checkbox"/> Business Process	<input type="checkbox"/> IT Systems	<input type="checkbox"/> (Other) _____	
Indicate the primary business driver for the project (check one that best applies)			
<input checked="" type="checkbox"/> State of Good Repair	<input type="checkbox"/> Regulatory Compliance	<input type="checkbox"/> Reliability/Redundancy	
<input type="checkbox"/> Capacity	<input type="checkbox"/> Mandated	<input type="checkbox"/> Other _____	
<input type="checkbox"/> Community Driver			
Project Summary This project includes the replacement of piping and valves in Tunnel Shafts for assets in poor physical condition with high risk scores and high consequence of failure.			
3. Approximate Project Cost Accuracy / Detail (Check One Which Best Applies)			
<input checked="" type="checkbox"/>	Conceptual Level Estimate (+/- 100% and/or AACE Class 4-5)		
<input type="checkbox"/>	Planning Level Estimate (+/- 50% or AACE Class 3-4)		
<input type="checkbox"/>	Preliminary Design (+/- 25% and/or AACE Class 2-3)		
<input type="checkbox"/>	Final Design (+/- 15% and/or AACE Class 1-2)		
<input type="checkbox"/>	Other _____		
4. Project Approvals			
Print Name / Preparer	Date	Signature	
Print Name / Chief	Date	Signature	
Print Name / Director	Date	Signature	
Print Name / Asst Commissioner	Date	Signature	

Validated Projects Are Prioritized

Factors That Are Evaluated

Physical Condition

Performance Condition

Regulatory/Environmental

Service Level/Reliability

Energy Efficiency

Public Image

Growth/Public/Community

O&M and Hazard

Financial

Lessons Learned

1

Develop, test and apply a standardized process

2

Prioritize using a 2 step process - risk and other important factors

3

Evaluate programs, not just facilities and assets

Case Study 2, Columbus, Ohio

How It Got Started

- ✓ Wanted to be develop a centralized office to implement a best in class asset management program
- ✓ Focused on risk assessment, performance management, and capital prioritization

Resulting Benefits


- ✓ Develop asset management program roadmap and Levels of Service for customer communication
- ✓ Developed robust business cases evaluation process to better prioritize their CIP
- ✓ Defensible CIP for Affordability Analysis


Scoring Criteria: Criteria Ranking


THE CITY OF COLUMBUS
SCHOOL & COLLEGE GRAD
DEPARTMENT OF PUBLIC UTILITIES


Proposed Criteria for Ranking Each Area


BL PR


- 

Number and size of overflows ●●●●●●●●●● Number of SSO locations and number of activations
- 

Leaky sewers having a downstream impact ●● Complex analysis, little weight
- 

Public exposure to overflows ●●●●●●●● Exposure risk: discharges to tributaries, near parks, schools
- 


Water in basement event ●●●●●●●● Number of WIBs
- 

Structural/Operations and Maintenance concerns ●●●● SCREAM Data
- 

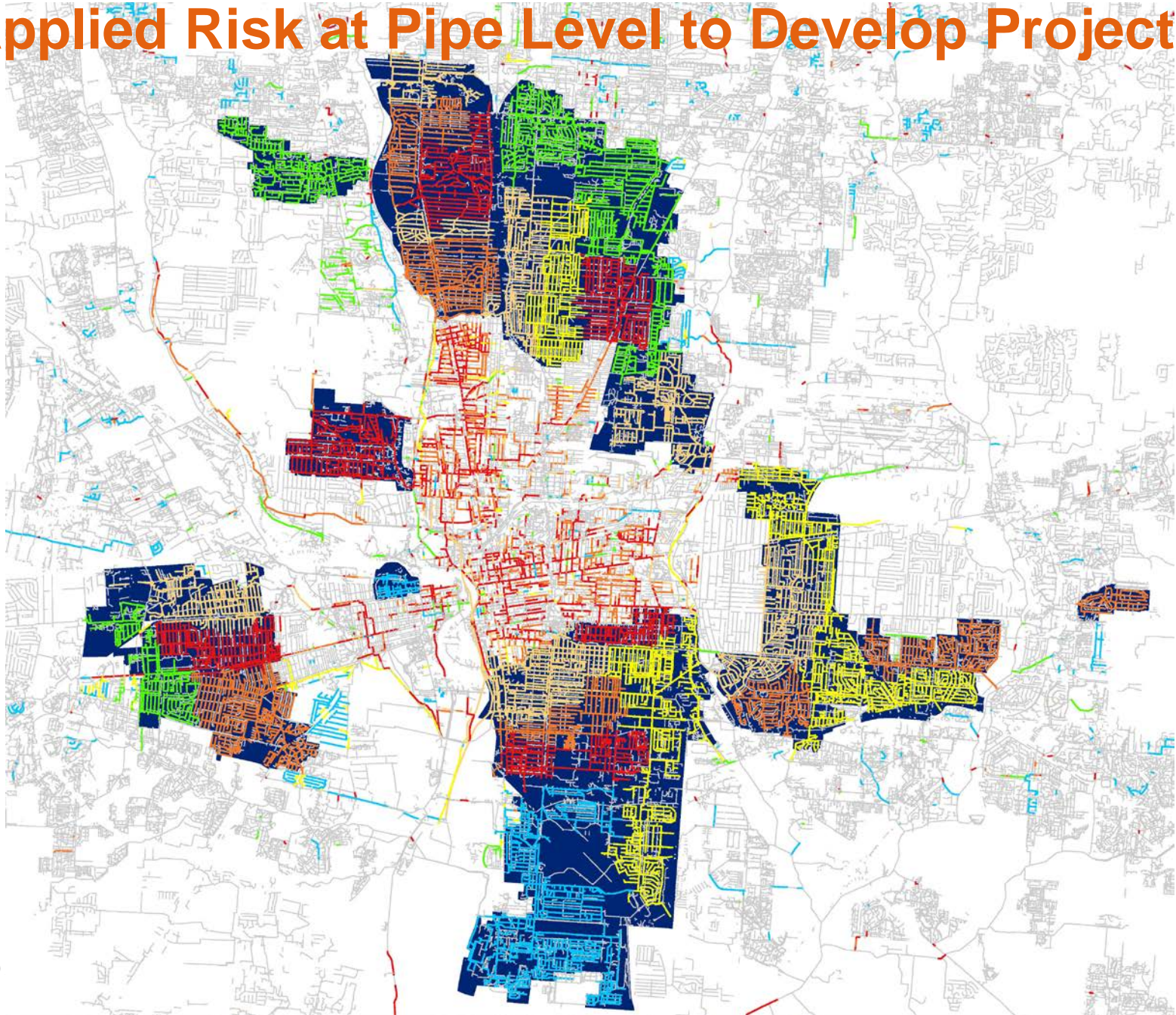
Water Quality ●●● Difficult to objectively score, little weight

*Social parameter
Community acceptance
ability to implement (cleanly, efficiently)
Neighborhood involvement* ●●●●●●

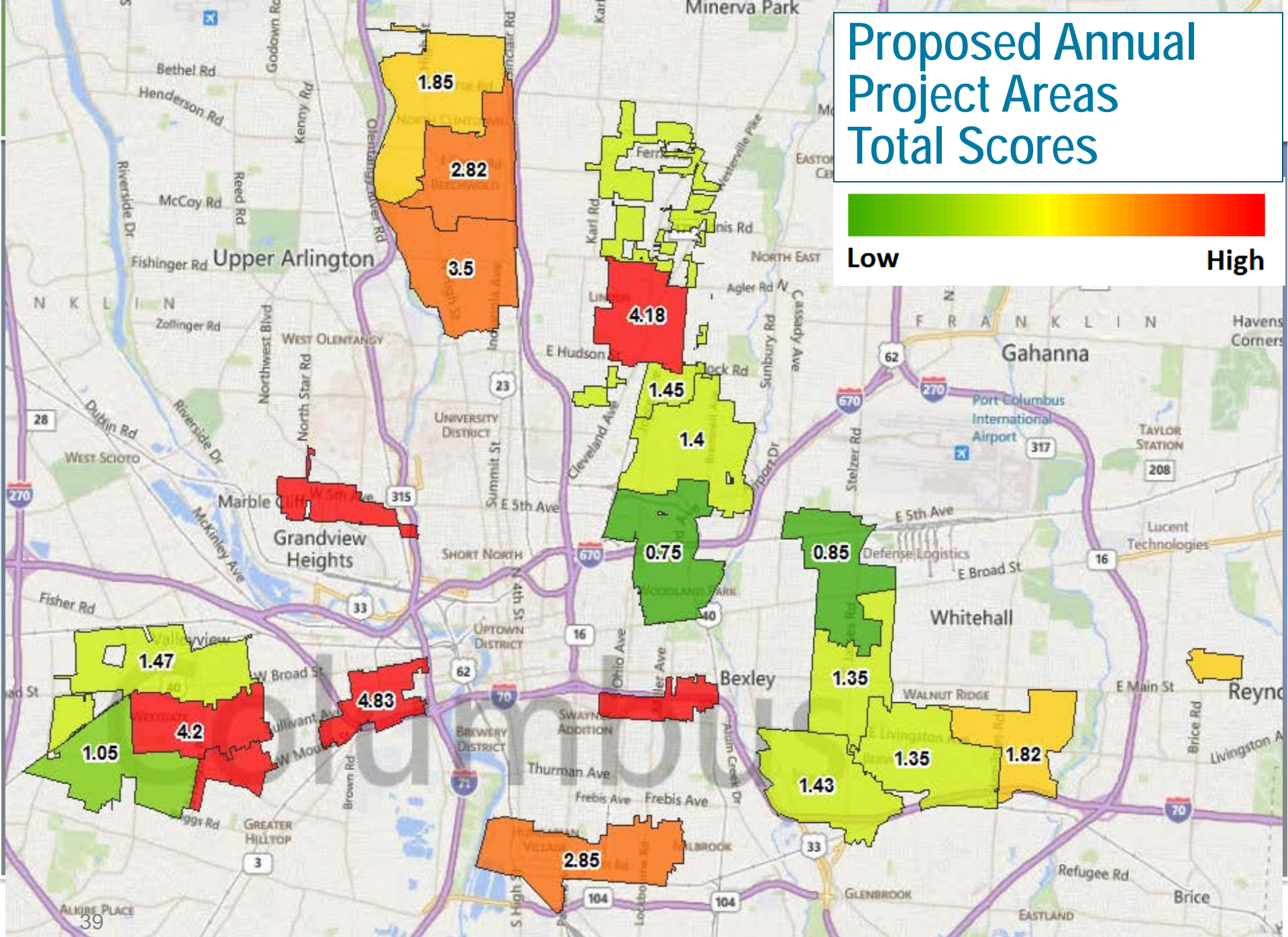
High interest - kept as final parameter



Applied Risk at Pipe Level to Develop Projects



Proposed Annual Project Areas Total Scores



Tools Were Used to Streamline Processes

Business Case Evaluation (BCE) Guidelines Document

February 2010
REVISED

Project/Proposal Business Case Evaluation Summary

Project / Proposal Name: _____

Project / Proposal Summary Information

Project / Proposal ID / Reference Number: _____ Date Business Case Prepared: _____

Project / Proposal Owner / Sponsor: Name _____ Title _____ Department: _____

Project / Proposal Prepared By: Name _____ Title _____ Department: _____

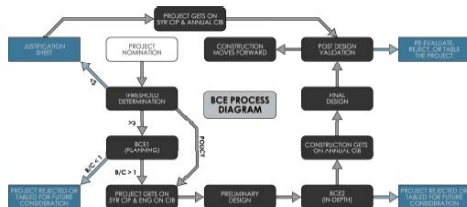
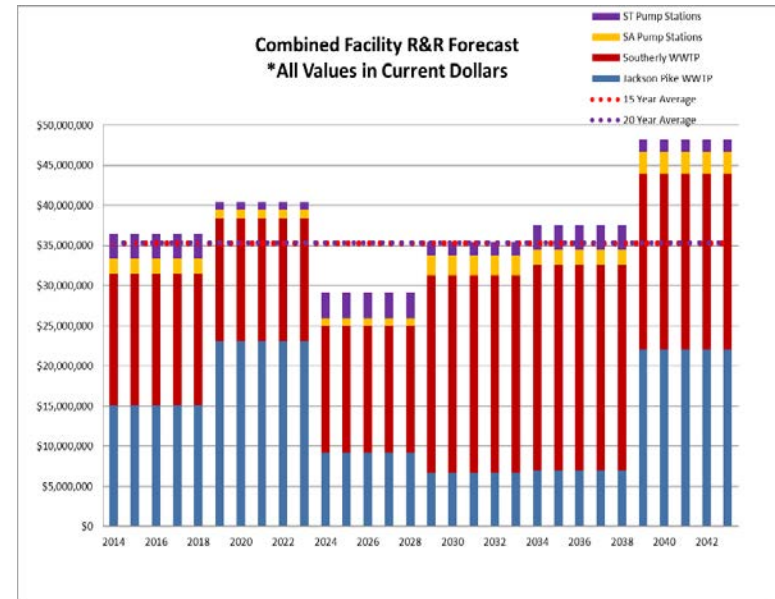
Primary Focus:

<input type="checkbox"/> WTP	<input type="checkbox"/> Pump Stations	<input type="checkbox"/> Distribution	<input type="checkbox"/> Water Resource
<input type="checkbox"/> WWTP	<input type="checkbox"/> Lift Stations	<input type="checkbox"/> Collection	<input type="checkbox"/> (Other)
<input type="checkbox"/> Elec Substations	<input type="checkbox"/> Distribution	<input type="checkbox"/> Lighting	<input type="checkbox"/> (Other)
<input type="checkbox"/> Business Process	<input type="checkbox"/> IT Systems	<input type="checkbox"/> (Other)	

List of Assets Involved (Or New Assets Proposed): _____ Map of Location and/or Asset Photos: _____

Project / Proposal Category

<input type="checkbox"/> Renewal/Rehabilitation/Replacement	<input type="checkbox"/> Growth / Capacity
<input type="checkbox"/> Regulatory Compliance	<input type="checkbox"/> Service Level / Enh
<input type="checkbox"/> O&M / Efficiency	<input type="checkbox"/> Other



C&P.U. City of Columbus, Department of Public Utilities
BCE Guidelines Document

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Project Business Case Analysis

Assumptions: **5%** Cost of Capital / Rk

Project Name: **D1 - Collection System Rehabilitation**

Useful Life: _____

Criticality Score: _____

Funding Source: _____

Financial Analysis	0	1	2	3	4	TOTAL
1 Revenue Generation						
Project Capital Costs						\$ -
Maintenance (R&R) / Replacement (O&M) and Other Costs						\$ -
Flow 1 (if Available)						\$ -
Flow 2 (if Available)						\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
2 Financial Ratios / Investments						
Initial Investment (i.e. replacement level)						\$ -
Operating Revenue (i.e. monthly charges (M&R))						\$ -
Energy Efficiency Systems						\$ -
Capital Cost Investment (Net Initial)						\$ -
Flow 1 (if Available)						\$ -
Flow 2 (if Available)						\$ -
Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Financial Metrics

Net Present Value (NPV) (Based on Investment) - 10 Yr Delay: _____

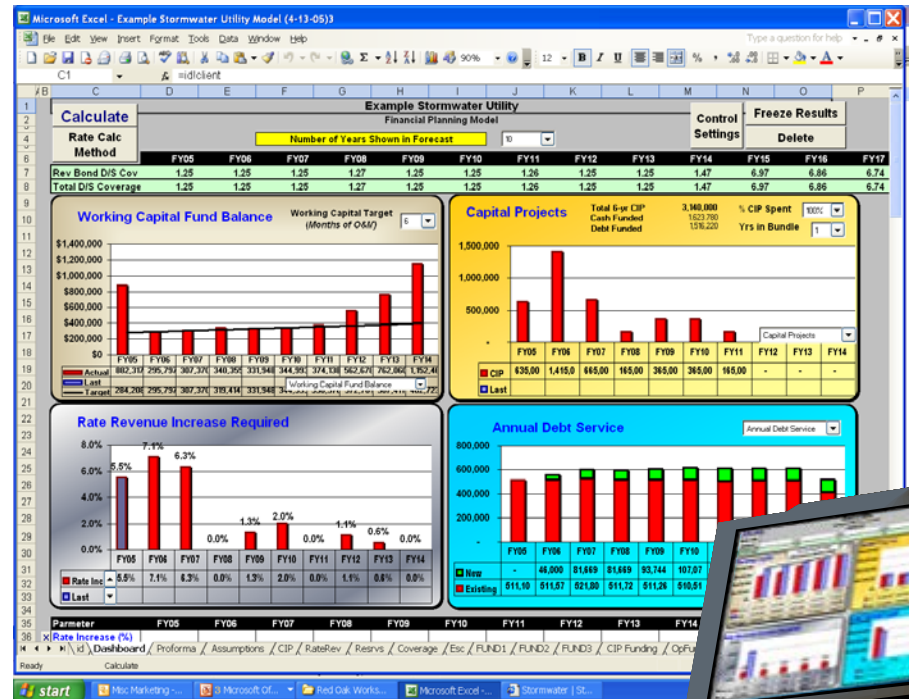
Internal Rate of Return (IRR) (Based on Investment) - 10 Yr Delay: _____

NPV (Net Present Value): _____

IRR (Internal Rate of Return): _____

Sustainable Financial Projections

- Capital Prioritization
- Affordability Analysis
- Funding Options



eFORECAST

Helps Balance Capital Funding and Rate Impacts

Case Study 3, DC Water

How It Got Started

- ✓ Wanted to better understand authority risk and develop LOS measures to communicate with stakeholders
- ✓ Focus on streamlining capital investment planning process – wanted to understand their long-term investment needs

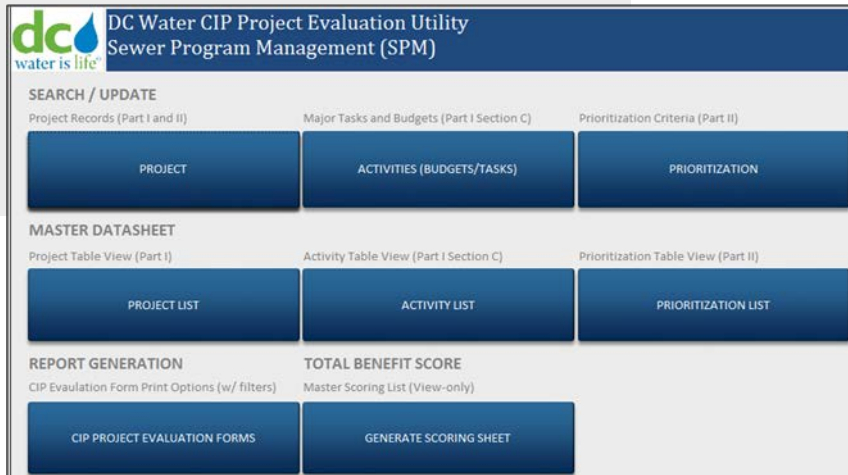
Resulting Benefits

- ✓ Developed advanced risk framework to prioritize inspection and assessment
- ✓ Develop capital planning tool to better prioritize their CIP
- ✓ Streamlined project selection process

Tools Were Used to Streamline Processes



SELECT PROGRAM



CIP Project Evaluation Form

Part I:

1. General Project/Job Information.

Form Completed at: Program Level Project Level Job Level

Project ID: IH Project Name: Combined Sewer Rehabilitation 2
 Job ID: IH02 Job Name: Comb Sewer Rehab and Repair Phase 7

New Project Existing Project Project Budget Modification
 Consent Decree Project Permit Required Board Mandate

Initiating Department: DES Business Case Evaluation (BCE) Applicable: Yes No
 CIP Service Area: C Business Case Evaluation (BCE) Completed: Yes No

Project Identified in Facilities Plan: Yes Date Justification Prepared (MM/YYYY): Board CIP Priority (1A, 2A, 2B, 2C, 2D, 3A or 3B): 3A
 Fiscal Year Introduced to CIP: 2011 Fiscal Year Closed in CIP:

Project Status: Planning Design Construction
 New Need Project Deleted Project Deferred
 Other

2. Project Overview

A. Project Description. Provide a brief description of the project and its scope. If this is a rehabilitation or replacement project, describe the assets affected including the location, type, material, size, capacity, length, age, etc.

This project rehabilitates sewer segments at within Woodley Park and Atlas District neighborhood. This project rehabilitates sewers in various locations within the District in association with the Sewer Rehabilitation Program identified in the Sewer System Facility Plan (SSFP). Project activities include pre-cleaning and closed-circuit television (CCTV) inspection to verify the proposed rehabilitation method, pipeline rehabilitation using trenchless technologies or excavated point repairs as necessary, lateral connection repairs, and manhole rehabilitation.

B. Project Justification. Provide supporting details for project, including reason for the project, project drivers, what problems and/or issues are being addressed, expected outcomes, analysis performed, data reviewed, alignment with

JobID	JobName	IsNewProj	IsExisting	IsCDE	IsPlanning	IsDesign	IsConstruct	IsNewNeed	IsApproved	IsApprovedBudget	Total Scoring Weight
J307	National Arboretum Sewer Rehab Construction Con	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4/1/2016	\$2,732,854	63
NG00	Stormwater Pumping Stations Rehabilitation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		\$0	57.2
J306	National Arboretum Sewer Rehab	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7/1/2010	\$9,416,426	55.1
IH04	Emergency Stormwater Storage At McMillan Sandfil	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	12/19/2012	\$14,330,000	48.9
DN23	Sewer Inspection and Cleaning Contract 16	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C, S	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		\$0	46.8
OB01	Inflatable Dams Replacement	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1/1/2024	\$6,675,000	46.8
HS03	Rehabilitation of East and West Outfall Sewer	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		\$0	47
MB01	3rd St and Constitution Ave NW Pumping Station Re	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4/15/2014	\$7,369,580	46.4
A432	Inflatable Dams - Life Cycle & Implementation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	4/1/2016	\$2,952,066	45.2
HS02	Rehabilitation of East Outfall Relief Sewer	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	1/15/2024	\$60,000,000	45
LY01	Sewer Facilities Security Upgrades	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10/1/2017	\$2,000,000	44.9
BO12	Spring Place Storm Manhole Rehab	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2/3/2015	\$350,780	44.9
DR02	Low Area Trunk Sewer - Rehabilitation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10/28/2013	\$15,886,980	44.9
G712	Spring Place Combined Sewer Rehab	<input type="checkbox"/>	<input checked="" type="checkbox"/>	C	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2/3/2015	\$700,560	44.9
AO01	FY2009 - DSS Storm Sewer Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4/1/2016	\$75,645	42.9
BF01	FY2011 - DSS Sanitary Sewer Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	6/1/2011	\$3,337,211	42.9
G601	FY2006 - DSS Storm Sewer Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4/1/2016	\$81,000	42.9
CD01	FY2012 - DSS Storm Sewer Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	7/11/2011	\$107,000	42.9
CN00	FY2013 - DSS Storm Sewer Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	D	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2/1/2013	\$652,264	42.9
CQ00	FY2013 - DSS Sanitary Sewer Projects	<input type="checkbox"/>	<input checked="" type="checkbox"/>	S	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	10/1/2012	\$0	42.9

AWWA AM Committee Survey Shows Many Still Need to Progress with BCEs

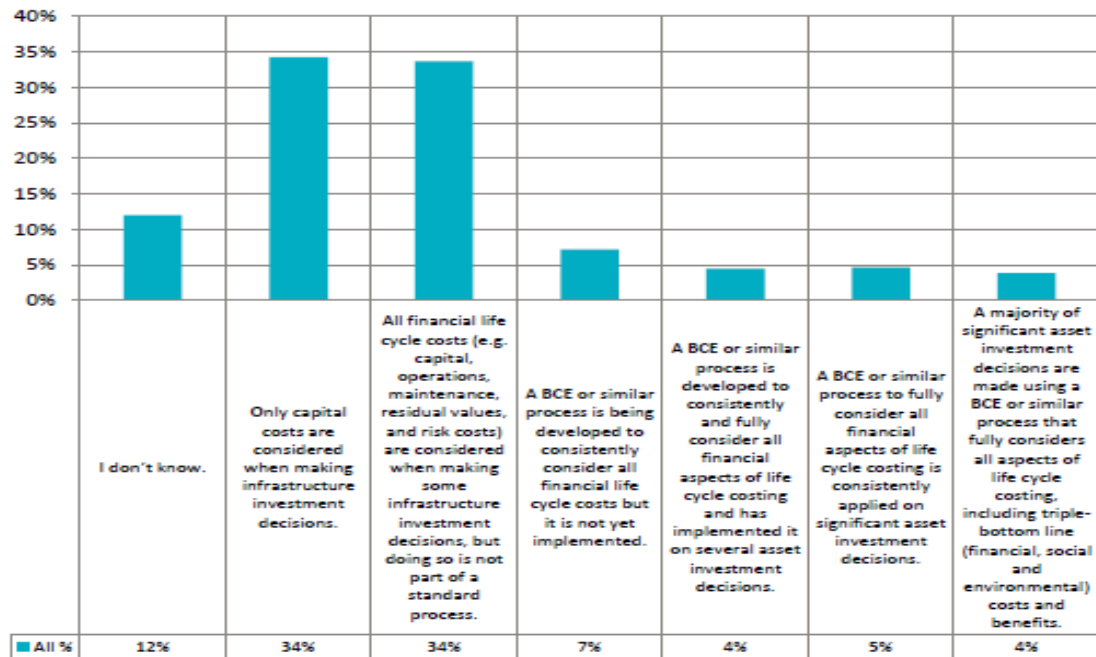


Figure 24. (Q27 2015) Does the organization require business case evaluations (BCE's) or have a program to fully consider all aspects of life cycle costing when making infrastructure investment decisions? (n=517)

More Progress with Risk Evaluations and Service Levels

Lessons Learned for CIP Planning

- Non-critical projects tend to cluster in the middle
- Provide a different path for projects that are critical e.g. safety-related
- Pilot the process, fine-tune it, train staff and then roll it out to avoid frustration
- Overall savings by doing the right project
- Data driven decisions
- Use automated tools



Questions?



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Improving quality of life.

Thank you

