

#### **Tactics for Adaptive Master Planning**

FWEA WR3 Seminar March 20, 2025

FSS

#### **A Water Lens**







REGULATIONS EMERGED



# Why Master Plans Go Stale



# Adaptive Tactics Provide Efficiency in Future Planning



TRUST



### **Needs within Utilities, Communities and Watersheds Provide Opportunities for Alignment**

#### **Stormwater**

**Regional Stormwater** 010 & Asset Management **Operations & Financial Needs** Urban Design (Redevelopment/New Development) Stormwater Beneficial Reuse MS4 Program Green Infrastructure Urban Flood Control Growth Service - Capacity & WQ Controls





**Financial Needs & Operations** Asset Management **Pretreatment Programs Biosolids - Residuals** Effluent Management Treatment **Collection System** Wet Weather & Growth Capacity









Growth Capacity **Demand Management** Distribution System (WQ & LOS) Treatment Residuals Asset & Energy Management **Operations & Financial Needs** 

#### Source Water & Watersheds

Source Water Protection & Quality Receiving Water Quality **Ecosystem Services** Water Rights Habitat Protection Land Subsidence & GW Depletion Flood Protection & Management

### **Agriculture**

Soil Health

Financial Needs

**Carbon Sequestration** 

Sustainability

Ś

Land Preservation **Irrigation Demands** 

Nutrient & Pest Management

Community **Development** 

Waste Management & Brownfields Economic Development Livability & Sustainability Transit & Transportation Public Safety Community Health Natural Resource Protection **Recreation & Land Use Planning** Revitalization

#### Industry



**Community Support** Cooling and Process Water Needs Wastewater Treatment Effluent Management



#### Atlanta Achieves Multiple Benefits through Creative One Water Solutions



Historic Fourth Ward Park, Atlanta, GA

Rodney Cook Sr Park, Atlanta, GA

### **Atlanta Met Multiple Needs and Delivered Value to our Communities through Collaboration**

**Growth Service - Capacity & WQ** 



**Financial Needs & Operations** Asset Management **Effluent Management Treatment** Wet Weather & Growth Capacity

**Demand Management** 



**Reuse Water Growth Capacity Demand Management** Distribution System (WQ & LOS) Treatment Residuals Asset & Energy Management **Operations & Financial Needs** 

#### Source Water & Watersheds

**Source Water Protection & Quality Receiving Water Quality Ecosystem Services** Water Rights Habitat Protection Land Subsidence & GW Depletion Flood Protection & Management



**Nutrient & Pest Management** 

#### Community **Development**

Revitalization

Waste Management & Brownfields **Economic Development** Livability & Sustainability Transit & Transportation Public Safety **Community Health** Natural Resource Protection **Recreation & Land Use Planning** 



**Facility Siting Cooling and Process Water Needs** 



**Goal:** Utility-facing One Water decision support framework and planning methodology to address multiple regulatory obligations, utility-specific drivers, regional challenges, and institutional structures.

#### **Specific objectives include:**



Achieve multiple **social and environmental** benefits



Address interconnected **CWA and SDWA regulatory** obligations.



Create One Water decision framework to **prioritize projects and initiatives.** 



Deploy decision support to address regulatory policies and processes using One Water planning.



Leverage **broad and diverse Water Sector engagement** to advance One Water concepts.





#### **Diverse Utility Engagement**

- Geography
- Utility Types
- Size
- Customer Demographics
- Institutional Structure



GRRA

Orleans

District

New York City DEP

Sewerage & Water Board of New

Northeast Ohio Regional Sewer

Ontario Clean Water Agencies

Fairfax Water

City of Fort Collins

City of Grand Junction

Hampton Roads Sanitation District

· City and County of Honolulu

- St Louis Metropolitan Sewer District
- City of St Petersburg
- Toronto Water
- Tucson Water
- Valley Water
- City of Westminster
- York Region



- Inform One Water Planning Guidance and Decision-Making Framework
- Oct 2023 to June 2024 Timeframe

#### Survey



#### **Virtual Workshops**

- Water Utilities 2 Workshops
  - Participating Utilities
- Water Sector Associations 2 Workshops
  - NACWA, AMWA, WEF, AWWA, WateReuse, US Water Alliance, Alliance for Water Efficiency
- Federal and State Regulatory Agencies 2 Workshops
  - EPA, States, Provinces, ECOS, ACWA, ASDWA
- One Water Stakeholders 1 Workshop
  - Academia, Agriculture, Industry, Watershed Organizations, Environmental Advocacy Groups
- One Water Framework Focus Group 1 Workshop
  - Select Utilities, Sector Associations, Regulatory Agencies, One Water Stakeholders





© 2023 The Water Research Foundation. ALL RIGHTS RESERVED. 11

#### Water Research FOUNDATION One Water Challenges and Barriers

Regulatory Inflexibility

THE

- Institutional Partnerships
- Community Support and Political Will
- Financial Constraints



## Water Research Community Needs and Goals

- Level of Service
- Limiting Public Disruption
- Communications
- Public Trust
- Affordability
- Equity & Environmental Justice





#### **1 Initiate One Water (or not) Planning**



#### 2 Explore Partnerships, Policies, & Practices



Technical Memorandum
 Workshops



Governance Regimes: Lessons from Watershed Partnerships. Journal of Water Resources Planning and Management. 143(9) September 2017.

# **Build the Vision**

Assess existing and anticipated challenges in addressing regulatory requirements while meeting customer expectations.



#### Evaluate Existing Systems Performance

**Evaluation of existing systems, supplies, and current performance** to evaluate current achievement of Level of Service goals, understand asset risk, and develop Basis of Planning *with trusted data*.





#### Rapidly Growing Utility creates Growth Uncertainty – Englewood Water

- Developers calling for 4 times growth of traditional population projection methods
- Utilized average growth of 4 projection trends and recommended 1.6% annual growth projection



#### Flexible Condition Assessment and Asset Management Planning for Facilities provides Early Wins

- Scalable approach based on desired level of detail
- Approach designed with asset management system in mind
- GIS-based survey tools



#### **Tools to Characterize and Monitor Existing Systems Performance provides Data-Driven Proof of Need**

- Spreadsheets, dashboards, models, etc.
- Key drivers:

o Determine available capacity

o Maximum infrastructure use

**o Efficient upgrade development** 





fire flow assessments

#### Understand Asset Risk to Drive Renewal Decision Making

- Age ≠ condition
- Age, performance, and criticality to determine priority





0265360

0625145

03230

0036

069703

016001

Storm Sewer Risk Score

RCP

VCP

• CP

PVCDIP

• CT

Unknowr



#### **LOS Goals and Metrics are Iterative**



#### **Engage Community Stakeholders**

#### Find a forum or tool that works for your community:





# Strategic Approach to Gather Support

- Benchmark and educate
- Gather input and build support
- Recognize and celebrate milestones

Influe	ncer	S							
Top Authors	Normania (1) (2) (2) (3) (3) (4) (4) (4) (4) (4) (4) (4) (4		Tc	Dep Sites	9000	Park #         Park #         12         12         12         12         12         12         12         12         12         12         12         13			
Demc Gender	ogra	but divertie web man man man man man man man man	, Ag	et athe da mine athe bit to be bit t	9		d dia management 2 Symptom		
36.43 For		63.6% D СС	)e or	fir nn	ne ni	e t ur	h	e ty	



Engage utility leadership, staff, & partners



# Involve the community



Get integrated plan approval from authorities

#### Decision Support Tool

#### **Evaluate Solutions, Prioritize & Schedule**



# A data-driven process for evaluating the performance of projects identified in a plan

What is our priority?	<ul> <li>Utility Drivers</li> <li>Regional Priorities</li> <li>Community Enhancement</li> </ul>
How do we decide?	<ul> <li>Structured Alternative Prioritization Process</li> <li>Triple Bottom Line</li> </ul>
What can we afford?	<ul> <li>Stakeholder Support</li> <li>Financial Capability Assessment</li> </ul>
When can we afford it?	<ul> <li>Review Rate Impacts and Program Delivery Over the Planning Period</li> </ul>

#### 4 Implement, Measure Success & Realize Benefits



Track implementation success through performance metrics. Make periodic CIP updates informed by modified goals, latest system understanding, and changing conditions.

#### **Key Performance Indicators**





#### **Adaptive Management**



#### **5 Adapt**



#### **Adaptive Integrated Plan Implementation 5-Year Action Plans & Annual Updates**

	IP YEAR 4 2023	IP YEAR 5 2024	IP YEAR 6 2025	IP YEAR 7 2026	IP YEAR 8 2027
omahawk Creek WWTF Construction					
Nelson Complex WWTF Improvements					
Blue River WWTF Phase 2 Improvements					
New Century WWTF Improvements					
Middle Basin FOG Receiving, Biosolids Improvements, Screening and UV Improvements					
Turkey Creek PEFTF Dechlorination Improvements					
Belinder Pump Station Renewal and PEFTF Dechlorination Improvements					
Dykes Branch Pump Station Improvements					
Other WWTF and Pump Station Renewal					
Mill Creek Wet Weather Storage Facility					
Facility Planning and Property Acquisition for Future PEFTF Elimination Projects					
Metcalf & 103rd - Indian Creek Interceptor Improvements					
State Line Road PS and Forcemain Improvements (Leawood Service Area Improvements)					
Ongoing Programs <sup>1</sup>					
					+
LEGEND Major Facility Upgrades WWTF & PS Renewal	System Capacity a	and PEFTF Elimination	System Expansion and	Misc. Projects	Ongoing Programs

![](_page_29_Picture_2.jpeg)

# FSS

Springfield, MO

#### Faces Major Financial Decisions in Long-Range Planning Horizon

![](_page_31_Picture_2.jpeg)

#### We Need to Look Deeper than Least-Cost Approach to Capital Investments

Alternatives	Capital Cost (\$M)	Expansion Costs (\$M)	Annual O&M (\$M)	Present Value Cost (\$M)
Current Service Area WWTP/Pump Station	\$276	\$92	-\$0.70	\$417
<b>Regional Solution</b>	\$414	\$75	-\$0.90	\$561

![](_page_32_Picture_2.jpeg)

#### Benefit-Cost Analysis Supports Higher Value Investment

Alternatives	Facility Present Value	Air Emission Reductions	Septic Tank Owner Savings	Water Quality	Land Value	Total Net Present Value	Benefit Cost Ratio
Current Service Area WWTP/Pump Station	- \$371	\$9	\$25	\$12	\$954	\$629	2.69
<b>Regional Solution</b>	- \$502	\$13	\$67	\$25	\$1,499	\$1,102	3.20

Springfie

# Utility Serves as Key Partner in Regional Economic Growth

Impact of new food manufacturing facility with 500 employees served by additional wastewater capacity

~1,300	<b>\$90M+</b>	~\$370M
total jobs	in labor income	in production/output

Impacts	Employment	Labor Income	Output
Direct	500	\$49,900,000	\$233,700,000
Indirect	441	\$25,900,000	\$80,300,000
Induced	339	\$17,000,000	\$54,700,000
Total	1,280	\$92,800,000	\$368,700,000

# Current and Near-Term Regulatory Drivers for Wastewater Utilities

- Wet Weather & Enforcement
- TMDLs
- Nutrient Reductions
- Biosolids Management
- PFAS & CECs
- Clean Air Act Compliance
- Environmental Justice

![](_page_35_Figure_8.jpeg)

#### Core values can be tied into LOS goals & metrics

![](_page_36_Figure_1.jpeg)

#### Holistic Approach to Improved Nutrient Management: Phase 1 WRF #4974

Figure 1. US Watersheds and Strategic Locations of Partner Utilities and Workshop Locations **T Workshop Locations** Partner Utilities

![](_page_37_Picture_2.jpeg)

Holistic Approach to Improved Nutrient Management | The Water Research Foundation (waterrf.org)

![](_page_38_Figure_0.jpeg)

#### Applying a One Water Planning Lens

WRF 5175 - Navigating One Water Planning through Municipal Water Programs

#### Taking a One Water Program Delivery

WRF 5196 – One Water Program Management

#### WRF 5175 Project Status

#### **TASKS:**

- **1.0 Build the Vision (Complete)**
- 2.0 Literature Review (In Progress)
- 3.0 Water Sector Engagement (In Progress)
- 4.0 Update UAA/WRF 1186 Project Paper (In Progress)
- 5.0 One Water Planning Guidance Document & Decision Tool (In Progress)

**Target Draft Guidance Document – July 2025** 

![](_page_39_Picture_8.jpeg)