WRF #4493 *Capital Funding Imperatives: Best Practices for Identifying, Prioritizing, Funding and Resourcing Capital Improvement Programs*

July 21, 2016

advancing the science of water
Celebrating 50 Years of WRF Research

As part of our year long 50th anniversary celebration, WRF will be highlighting several utility stories, showcasing subscriber utilities that have achieved great things, in part because of their use of and participation in WRF research projects.

Advances in Water Research Magazine

The 2nd quarter issue includes features on pressure management, residential end use, metals accumulation in distribution systems, and AMR/AMI standardization.

Research Results and Tools

Access to Project reports and updates, Case Studies, Web Tools, State of the Science documents, and more.

Knowledge Portals

- Utility Finance
- Customer Service
- Advanced Treatment
- Water Efficiency
- Desalination and Reuse
- Chemicals of Emerging Concern
- Asset Management
- Distribution System Integrity
- Energy Management
- Climate Change
- Microbial
The objective of this project was to advance the state of knowledge and resources available to utilities in advancing priority capital projects from concept to execution stage. The six focus areas related to the capital funding process addressed by the project include:

1. Balancing system development needs with infrastructure renewal needs
2. Program implementation approaches and systems
3. Business case evaluations
4. Prioritization of projects and initiatives
5. Increasing stakeholder involvement and customer research (in planning/prioritization and also in program implementation)
6. Capital program funding approval and resourcing processes

In addition to the final report, the research team also gathered 47 supplemental documents related to the five of the six topics above. These documents are posted below under Project Papers, and are organized by topic. Published in 2016.
2016 WIC

November 1, TUE01 –
Enhancing Capital Funding
Approaches Accelerates
Proactive Asset Management
Water utilities are facing a myriad of financial challenges in the current business environment. Utilities must provide high-quality water to their customers, upgrade their facilities and distribution systems in a time when funds are scarce, and meet new regulatory requirements - all while keeping rates at a level suitable for their customers’ economic situations.
Current and Upcoming Finance Projects

2016
- Identifying and Evaluating Opportunities for Reducing Variability of Utility Revenues

2017
- Customer Assistance Programs for Multi-Family Residential and Other Hard to Reach Customers
- New and Emerging Capital Providers for Infrastructure Funding

2018
- Challenges and Practical Approaches to Water Reuse Pricing

RFPs
- Trends And Best Practices Of Water And Wastewater Capacity And Connection Charges And Transactions
- Alternative Project Delivery Performance Evaluation and Decision Support Tool for Water and Wastewater Capital Projects
- Incentives For Green Infrastructure On Private Property: Lessons Learned
Presenters

- Mike Matichich, CH2M

Fair Yeager, CH2M

- Tim Noyes, Toho Water Authority

Martin Tower, Austin Water
Overview of WRF Project 4493

Mike Matichich & Fair Yeager
Principal Investigator & Project Manager
CH2M
Presentation Outline

• Project Overview
• Identification of Candidate Topics for Research
• Case Study Process
• Research Products and Schedule for Release
• Capital Improvement Plan Prioritization Case Study
  – Toho Water Authority
• Capital Funding Approval and Resourcing Case Study
  – Austin Water
• Q&A

advancing the science of water
WRF Project 4493 was funded to advance the state of knowledge and resources in light of drivers that focus attention on capital programs, including:

- Financial Constraints
- Customer Demands
- Aging Infrastructure
- Security & Emergency Response
- Growth
- Climate Change
- Regulatory Compliance
- Social Considerations
- Evolving Financing Options
- Advances in Technology
The project is intended to build upon previous WRF and industry resources where available.
Project team

- Water Research Foundation
  - Jonathan Cuppett, Research Manager
- Project Advisory Committee
  - Jacqueline Culton, City of Dallas
  - Cathie O’Toole, Halifax Water
  - Frank Grimshaw, Severn Trent (retired)
- Participating Utilities
- Project Research Team
  - Mike Matichich, PI
  - Fair Yeager, PM
  - Senior Advisors
    - Yakir Hasit
    - Bill Bellamy
    - Steve Whipp
  - Communication Strategy & Support
    - Mary Tiger
- Subject Matter Experts
A diverse utility team provided the foundation for developing and reviewing useful case examples

<table>
<thead>
<tr>
<th>United States:</th>
<th>Philadelphia Water Department (PA)</th>
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<tbody>
<tr>
<td>Albuquerque Bernalillo County Water Utility Authority (NM)</td>
<td>City of Phoenix Water Services Department (AZ)</td>
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<tr>
<td>City of Atlanta (GA)</td>
<td>Portland Water Bureau (OR)</td>
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<tr>
<td>Austin Water Utility (TX)</td>
<td>San Francisco Public Utilities Commission (CA)</td>
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<tr>
<td>Charleston Water System (SC)</td>
<td>City of Scottsdale Water Resources (AZ)</td>
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<tr>
<td>Clean Water Services (OR)</td>
<td>Seattle Public Utilities (WA)</td>
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<tr>
<td>City of Columbus (OH)</td>
<td>Southeast Morris County Municipal Utilities Authority (NJ)</td>
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<tr>
<td>Covington Water District (WA)</td>
<td>Tampa Bay Water (FL)</td>
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<td>Fort Wayne City Utilities (IN)</td>
<td>Toho Water Authority (FL)</td>
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<tr>
<td>City of Fresno Department of Public Utilities (CA)</td>
<td>Trinity River Authority of Texas (TX)</td>
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<tr>
<td>Gwinnett County Department of Water Resources (GA)</td>
<td>Tucson Water Department (AZ)</td>
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<tr>
<td>City of Los Angeles Department of Water &amp; Power (CA)</td>
<td>Canada:</td>
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<tr>
<td>Louisville Water Company (KY)</td>
<td>The City of Calgary Water Resources (AB)</td>
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<td></td>
<td>Toronto Water (ON)</td>
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<td><strong>Australia:</strong></td>
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<td>South East Water</td>
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The effort has been designed to devote much of the time and resources to targeted research of priority areas.
The team used the Capital Planning Strategy Manual and other existing literature as starting points to frame candidate topics for research.
Facilitated dialogue and polling of the extended research team were used to narrow the focus areas

1. Balancing system development needs with infrastructure renewal needs
2. Program implementation approaches and systems
3. Business case evaluations
4. Prioritization of projects and initiatives
5. Increasing stakeholder involvement and customer research (in planning/prioritization and also in program implementation)
6. Capital program funding approval and resourcing processes
Case study teams were chartered for each topic spanning the range of steps in the capital planning process.
On today’s webcast, you will hear presentations from utilities that contributed case studies for two of the focus areas.

**Stakeholder Involvement**

1. Define Mission
2. Frame Problem
3. Data Management Protocol
4. Identify and Screen
5. Prioritize
6. Finalize Plan and Obtain Approval
7. Implement

**Asset Management**

**Stakeholder Involvement**

- BCE
- Prioritization
- Funding / Resourcing
- PMIS
Teams identified best practices and case study examples for their topics using the outline below:

- **Introduction to the topic**
  - Description
  - Why is this of interest to the water industry?
  - Which utilities are most likely to benefit by addressing this topic?
  - Key takeaways from the case studies

- **Introduction to the case studies**

- **Individual case studies**
  - Context and challenges addressed
  - Options considered
  - Solution selected
  - Path to the solution
  - Obstacles encountered
  - Benefits/results achieved
  - Remaining gaps
  - Future plans

- **Discussion**
  - Lessons Learned
  - Recommendations
    - For utilities
    - For WRF
Case study teams contributed to the identification of cross-cutting themes and findings

- Integration of Individual Capital Funding Elements Provides Added Value
- Scale and Context Matter
- Advances in Technology Present Unique Opportunities
- Communication Increasingly Drives Opportunities for Success
- Customer Focus Increases Likelihood of Securing Support
Integration of Individual Capital Funding Elements Provides Added Value
Scale and Context Matter

Factors identified by the case study teams that influence the selection of approaches and tools

- Utility size
- Capital Program size
- Governance (e.g., public versus private utility, City/County department versus free-standing regional authority)
- Asset age and condition
- Availability of repair parts/replacement equipment
- Values important to a specific utility
- Utility customer/asset growth rate
- Asset categories and complexity
Advances in Technology Present
Unique Opportunities
Communication Increasingly Drives Opportunities for Success

Early stage focus for CIP prioritization is typically internal..........
Communication Increasingly Drives Opportunities for Success

....but later stage communications on CIP prioritization increasingly focus on external communications
Customer Focus Increases Likelihood of Securing Support

Courtesy of Albuquerque Bernalillo County Water Utility Authority
The resulting products for this project include:

<table>
<thead>
<tr>
<th>Project Report</th>
<th>Supporting Materials as Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Overall findings</td>
<td>• End products (e.g., adopted CIP for prioritization topic, completed BCEs)</td>
</tr>
<tr>
<td>• Summary write-ups for the six case study teams</td>
<td>• Methodology documents, such as instructions on how to conduct BCEs</td>
</tr>
<tr>
<td>– Overview of the topic</td>
<td>• Documents that illustrate the evolution of practice</td>
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<tr>
<td>– Best practices</td>
<td>• Documents that show the internal schedules used to implement the processes</td>
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<tr>
<td>– Case study examples</td>
<td></td>
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<tr>
<td>– Discussion</td>
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<tr>
<td>• Cross-cutting themes and linkages (e.g., close connection found between BCE and CIP Prioritization efforts)</td>
<td></td>
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<tr>
<td>• Literature Review</td>
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</table>
In addition, a half-day session at WIC in Phoenix on November 1st will feature four utility case study presentations:

- **Balancing system development needs with infrastructure renewal needs**
  Dean Trammel, Tucson Water

- **Program implementation approaches and systems**
  Gino Rapagna, CH2M
  Michael Carbajal, Fresno Water Department

- **Business case evaluations**
  Jeff Winner, Portland Water Bureau

- **Increasing stakeholder involvement and customer research**
  Frank Roth, Albuquerque Bernalillo County Water Utility Authority
Overview of Toho Water Authority’s Journey

Tim Noyes
Asset Manager
Toho Water Authority
• Introduce Toho Water Authority
• Reasoning and Motivation for our CIP Prioritization Process
• Process Description
• Process Refinement and Modifications
• Lessons Learned
• Future Opportunities
Serving Osceola

Established in October 2003 by a special act of the Florida legislature, Toho Water Authority (TWA) is the largest provider of water, wastewater and reclaimed water services in Osceola County. Toho currently serves approximately 88,000 water, 82,400 wastewater and 12,000 reclaimed water customers in Kissimmee, Poinciana and unincorporated areas of Osceola County.

Toho owns and operates 14 water plants and 8 wastewater plants. With a 250+ person workforce, Toho treats and distributes approximately 31 million gallons of potable water and reclaims 20 million gallons of wastewater each day.

Toho is governed by a six-member board of supervisors responsible for approving all its operating policies and its nearly $85 million operating budget. Toho was established for the sole purpose of providing regional stewardship over water resources in Osceola County.
Motivating Factors:

GROWTH & MATURING

Water & Sewer Department - Kissimmee

Toho Water Authority created

Purchase neighboring Utility and grows 20 - 25%

Purchase five small facilities and integrates

Purchase neighboring Utility and grows 20 - 25%

Insource Human Resource Function

Insource Customer Service & Billing

MANAGING THE GROWTH

2003

Operations Plan Developed

2005

2006

Strategic Plan Developed

2007

2008

Asset Management Plan

2010

2012

2016
Goal 1: Develop and implement an Asset Management Program that allows Toho to plan, operate and maintain infrastructure at an acceptable cost.

Objective 1: Define inventory, condition and service levels of Toho’s assets.

Objective 2: Document and manage Toho’s capacity management operations and maintenance (CMOM) Program.

Objective 3: Develop an asset management driven capital improvement program (CIP) that ensures meeting current and future service levels.

Goal 2: Optimize infrastructure performance to maintain public confidence.
Program Overview

Enterprise Resource Planning Software

Budget Database
Program Overview

1. Existing Business Cases
2. New Business Cases

Enterprise Resource Planning Software

Budget Database
Program Overview

DEVELOPMENT

1. Existing Business Cases
2. New Business Cases
3. Enterprise Resource Planning Software
4. Budget Database

REFINEMENT

2. Division Review
3. Executive Review
4. Board Review
Areas where the process has evolved...

- Prioritization Criteria
- Level of Detail
- Applicability
Process Refinement: Prioritization Criterion

Initial

Physical Condition
*  
Process Condition
*  
Consequence of Failure

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Process Refinement: Prioritization Criterion

Initial

- Physical Condition
  * Process Condition
  * Consequence of Failure

Interim

- Physical Condition
- Process Condition
- Strategic Alignment
- Financial Returns
- Economic / Financial Considerations
- Public Image
- Service Level/Reliability
- Public/Employee Safety
- Environmental / Efficiency
- Energy
Process Refinement:
Prioritization Criterion

Initial
- Physical Condition
- Process Condition
- Consequence of Failure

Interim
- Physical Condition
- Process Condition
- Strategic Alignment
- Financial Returns
- Economic / Financial Considerations
- Public Image
- Service Level/Reliability
- Public/Employee Safety
- Environmental / Efficiency
- Energy

Current
- Physical Condition
- Process Condition
- Strategic Alignment
- Financial Returns
- Economic / Financial Considerations
- Public Image
- Service Level/Reliability
- Public/Employee Safety
- Environmental / Efficiency
- Energy

Condition
- Alignment
- Financial
- Social
- Environmental
Process Refinement: Prioritization Criterion

All Engineering Business Cases - 5 Year All Fund Type

- Environmental
- Social
- Financial
- Alignment
- Condition
- Cumulative Total

5 Year Budget Total
Process Refinement:  
Level of Detail  
Applicability

Level of Detail - level of effort must not be exceed by perceived value
• Necessary to find the “right” level of information/justification for the business case
• Realizing that some data may not be available due to the current stage of the business case
• “Nice to have” versus “required to justify”

Applicability
• Difficult to prioritize mandated (regulatory, growth, road) projects with others
• Level of effort required to score a mandated project not necessary
Benefits & Results:

• Recommended CIP Projects are justified based on objective data and facts rather than subjective criteria or no justification at all

• Cross functional participation in prioritization has improved the process

• Regular dialog between Divisions
Future Opportunities:

• Monetizing the value associated with the reduction in risk and incorporating this into the prioritization methodology

• Incorporating a post mortem review of completed projects
  • Determine whether project objectives were achieved
  • Recommend possible improvement in estimation methods
  • Determine whether additional work is required to achieve project objectives

• Extend planning horizon for asset renewal projects
  • Currently use five-year budget cycle
  • Use as an informal planning tool
Austin Water Case Study

Martin F. Tower, MS, PE
Capital Improvements Program Manager
Austin Water
Austin Water

- 1M People Served
- 548 mile² Area
- W/WW/RW Service Provider
- Department of City
- 1,150 Employees
- FY16 CIP Budget = $154M
The Challenge

At the time...
- Weather Impacts Water Sales
- Water Sales Impact Revenue
- High Profile Projects Underway
- Heightened Community Interest

Management needed...
- Greater visibility of CIP Project Progress
- Additional CIP Project Controls

![Historic 5 YR CIP Budgets](chart.png)
The Solution: CIPPAR

- Project Phase Change Approval Mechanism
- Automated Multi-level Authorization Workflow
- Transparent & Auditable
- Developed by AW Staff using existing tools
CIPPARAR Development

- OTS Software supports Form Building, Workflow, Records Management
- References enterprise Project Tracking Database
- Users notified by email with link to form
Expected Outcomes

- Communications between Management and Project Team improved
- Change management requires persistence
- Enterprise Project Data Quality Improved
Unexpected Outcomes

- Communications within project teams improved
- Evolved into primary CIP funding mechanism
- Virtuous cycle of quality data and key insights
- Calls for more eForms

**Typical Project Team**

- Austin Water
- Public Works
- Contract Compliance
- Watershed Protection
- Small & Minority Business
- Financial Services
- Street & Bridge
- Economic Development
- Transport
- Engineering Consultant
- Constructor
- Testing & Inspection
Next Steps

• Improve data management to enable additional analysis
• Expand role in enterprise data protocol compliance
• Streamline user experience
• Reduce maintenance burden
Thank You

Comments or questions, please contact:
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Fair.Yeager@ch2m.com
TNoyes@tohowater.com
Martin.Tower@austintexas.gov

For more information visit:
www.waterrf.org