



The Water Works Board of the City of Birmingham

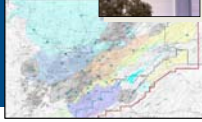


Risk Based Capital Program Management: *Balancing Risk and Funding*

Sonny Jones, PE – BWWB



BWWB Infrastructure Overview

- 200,000 Connections
- 630 Employees
- 4 Raw Water Intakes
- 4 Treatment Plants
- 19 Pressure Gradients
- 3,800 Miles of Pipe
- 45 Pump Stations
- 50 Storage Tanks
- Estimated CIP = \$70 million (annually)



Universal Challenge

Do More With Less!

- Increasing Operational Costs (e.g., power and chemical)
- Increasing Regulation
- Aging Infrastructure
- Low Tolerance for Rate Increases
- Asset Rich Organizations May Have More Needs Than Funding

Today's Goal

To present a method for focusing expenditures on highest impact projects and for presenting the plan to management and stakeholders.

...a prioritization system for budgeting capital needs.

Outline

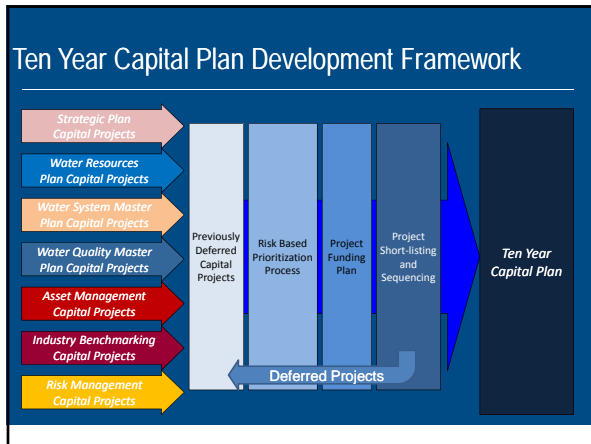
- Framework of the Capital Program
- Business Case Development
- Risk Based Prioritization
- Capital Plan Development
- Capital Plan Management



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Framework of the Capital Program

Strategic Plan

- Establishes a Formal Document that Communicates the Utility Leadership's Vision for the Future.
 - Define Mission and Core Values
 - Select Operating Philosophy
 - Assess Risks and Opportunities
 - Set Goals
 - Breakdown to Objectives
 - Develop Strategies or Roadmap



Framework of the Capital Program

Water Resource Plan – Water Supply

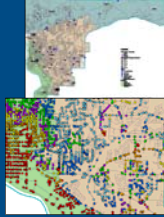
- Assesses Ability of Existing Supply to Meet Future Demands and Options for Improvement
 - Defines Existing Source Safe Yield
 - Defines System Reliability
 - Forecasts Long Term Need
 - Summarizes Alternatives for Meeting Long Term Need
 - Provides Cost and Implementation Schedule



Framework of the Capital Program

Water System Master Plan – Potable Water

- Provides an Assessment of Treatment Plant and Distribution System in Relation to Population/Demand Patterns
 - Provides Flow and Pressure Analysis
 - Identifies Storage or Improvements
 - Provides Alternatives
 - Provides Cost and Implementation Schedule



Framework of the Capital Program

Water Quality Master Plan

- Audits Available Data and Operations for Regulatory Compliance Challenges as well as Opportunities for Improvements
 - Identifies Trends in Raw or Treated Water Quality
 - Performs Regulatory Compliance Forecast
 - Identifies Performance Limiting Factors (PLFs)
 - Evaluates Operational or Treatment Alternatives
 - Provides Cost and Implementation Schedule



Framework of the Capital Program

Asset Management Plan

- Provides an Approach for Tracking Asset Condition and Failure Risk
 - Documents Asset Information
 - Establishes Baseline Condition Assessment
 - Tracks Actual and Service Life
 - Provides Standard for Root Cause Analysis
 - Defines Maintenance Practices – Moves from Corrective to Preventative Maintenance
 - Provides Cost and Implementation Schedule

Framework of the Capital Program

Industry Benchmarking and Best Practices

- **Assesses Utility Among Peers In Relation to Best Practices**
 - Identifies Industry Trends in Operation and Management
 - Provides Competitive Assessment of Utility
 - Establishes Utility Specific Performance Metrics
 - Unaccounted for Water
 - Meter Accuracy and Changeout
 - Pipeline Replacement
 - Translates Metrics Into Capital Expenditure Goals and Schedule

Framework of the Capital Program

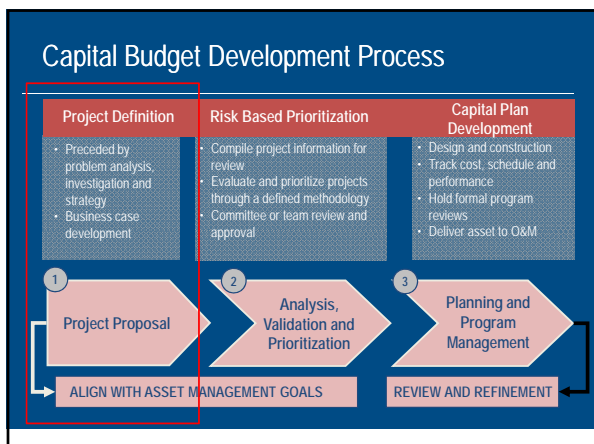
Risk Management Plan

- **Assesses Risk Factors and Develops Mitigation Plans.**
 - Assesses Condition of Critical Infrastructure
 - Reviews Organizational and Maintenance Practices
 - Conducts Vulnerability Reviews Regarding Intentional Attack and Natural Disaster Events.
 - Develops Mitigation and Emergency Management Plans.
 - Implements System Monitoring and Response Protocol.

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Project Definition Business Case

- Build Business Discipline and Common Processes
- Encourage Analysis of Options and Alternative Solutions
- Document Customer and Environmental Impacts
- Ensure Alignment with Framework

New Pumping Station X

- Project Description and Purpose
- Service Level (Customer and Environmental) Impact
- Risk and Criticality Analysis
- Life Cycle Cost Analysis
Design and construction (capital)
Operators and maintenance
- Financial Analysis
NPV, ROI, IRR, Cost / Benefit
Funding source
Financial Condition
- Other Issues, Recommendations and Alternatives

Project Development Business Case Content

- Project Description and Purpose**
 - High level project overview and summary. What business drivers and factors are behind this proposal? What assets are involved? Is this aligned with the utility framework?
- Service Level (Customer and Environmental) Impact**
 - What impact is the project expected to have on service level goals and targets (i.e. reliability, response times, quality, etc.)?

Project Development

Business Case Content

3. Risk and Criticality Analysis

- What is the likely impact if the existing asset fails or does not meet demand/regulatory compliance? Have expected life and condition been formally evaluated? What are the likely failure modes and probability of failure?

4. Life Cycle Cost Analysis

- What is the expected design and construction implementation cost over the duration of the project? What O&M costs or savings are likely to be achieved? What is the expected service life of the new asset?

Project Development

Business Case Content

5. Financial Analysis

- What level of financial analysis has been performed to justify this project or compare with likely alternatives (ROI / NPV / Present Value)? What is the likely funding source for the project (i.e. O&M, capital reserves, new debt).

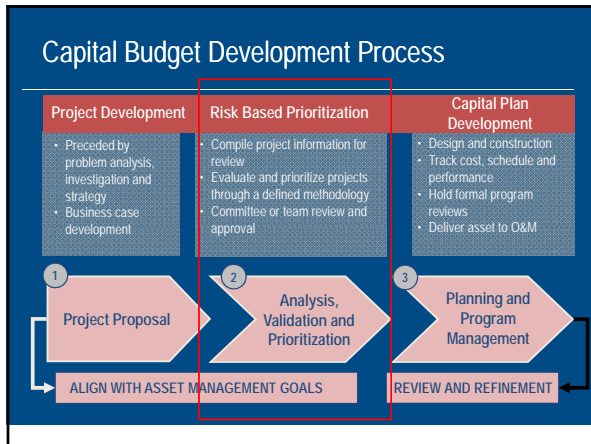
6. Other Issues, Recommendations and Alternatives

- Are there likely project alternatives that can be evaluated in parallel? Are there questionable assumptions that need to be validated (i.e. future growth or regulatory uncertainty)?

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Risk Based Prioritization

Project Prioritization – Project Type

- Growth/Enhancement** – projects required to serve new growth and/or increased demand, to improve service levels, reduce risk, or meet changing regulatory requirements
- Rehabilitation / Replacement** – projects aimed at replacing assets that are reaching the end of their useful lives based on condition, likelihood, and consequence of failure.

Risk Based Prioritization

Project Prioritization – Growth/Enhancement

Financial and Strategic Alignment Scores

- Financial Returns (1 – Minimal/Negative to 5 – Very High)
- Alignment with Strategic Goals (1 – Not Aligned to 5 – Fully Aligned)

Project Impact Categories

- Regulatory Compliance
- Service Level / Reliability
- Operations and Maintenance
- Efficiency / Energy
- Growth / Public / Community
- All rated as: 1 – Minimal to 5 – Major Impact

Risk Based Prioritization

Project Prioritization – Rehabilitation/Replacement

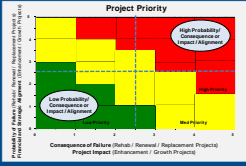
Probability of Failure Scores

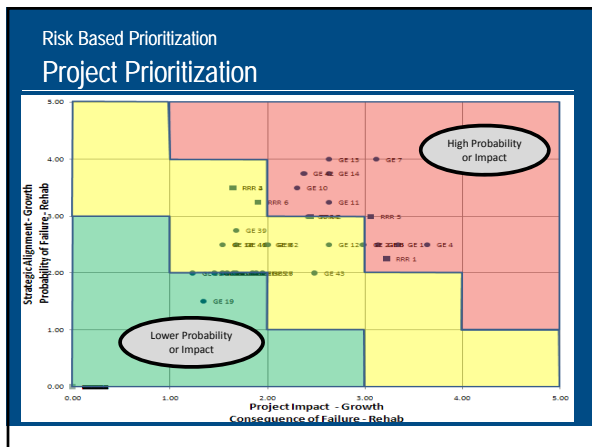
- Process Condition (1 – Excellent to 5 – Very Poor)
- Physical Condition (1 – Excellent to 5 – Very Poor)

Consequence of Failure Categories

- Environmental
- Service Level / Reliability
- Public/Employee Safety
- Public Image
- Financial


All rated as: 1 – Insignificant to 5 – Catastrophic





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Capital Plan Development

Assembling the Capital Plan

- **Must Meet Financial Goals**
 - Limited Rate Increases
 - Improved Debt Service Ratio
 - Restored Reserve Fund
- **Meet System Needs**
 - Frontloaded Compliance Spending
 - Increasing Capacity Spending
 - Slow Increase in Maintenance Spending

Year	Regulatory	Risk Management	Capacity	Performance	Maintenance	Annual Capital Budget
2010	~\$10M	~\$10M	~\$10M	~\$10M	~\$10M	~\$70M
2011	~\$10M	~\$10M	~\$15M	~\$10M	~\$10M	~\$68M
2012	~\$10M	~\$10M	~\$20M	~\$10M	~\$10M	~\$65M
2013	~\$10M	~\$10M	~\$25M	~\$10M	~\$10M	~\$62M
2014	~\$10M	~\$10M	~\$20M	~\$10M	~\$10M	~\$60M

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Capital Plan Management

- Maintain Documentation on Projects
- Establish Schedule for Project Launch and Completion
- Track Work Progress
- Track Capital Drawdown/Expense
- Perform Expenditure Forecast
- Develop Flexible Spending Plan
- Provide Feedback into Other Business Cases

Summary and Conclusion



- Building a Framework Supports A Structured Approach to Planning
- Using Business Cases Creates a Common Language
- Establishing Risk Based Prioritization Directs Funding to the Most Critical Needs
- Managing the Capital Plan Actively Allows for Utilities to Make Timely Decisions

Questions?

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