

CASE STUDY

CITY OF ATLANTA, GA DEPARTMENT OF WATERSHED MANAGEMENT

Integrating Master Plans Using Optimatics' Project Prioritization Software

Balancing Green & Grey Infrastructure Investment City of Atlanta Department of Watershed Management

Key Points

- Three-dimensional optimization of high triple bottom line (TBL) benefits, maximum risk reduction, and minimal cost budget overages
- Quantifiable and equitable evaluation was obtained to justify decisions by using a mathematical model

Customer Reference

Mikita K. Browning
Commissioner
Atlanta Department of
Watershed Management

System Description

The City of Atlanta's Department of Watershed Management (DWM) is responsible for drinking water, the collection and treatment of wastewater, and stormwater services. DWM provides drinking water for up to 1.2 million people each day throughout the City of Atlanta (City), several cities outside of Atlanta, and parts of unincorporated Fulton County. The wastewater collection service area encompasses the City, Northwest DeKalb County, a small portion of Clayton County, and parts of North and South Fulton County. The service area includes 3 permitted water reclamation centers and 2,150 miles of sewer mains. Stormwater services encompass 500 miles of pipe and over 50,000 inlets and outfall structures.

Purpose

With three recently completed master plans (water, wastewater, and stormwater), the Atlanta Program Management Services Team (PMST) was tasked with developing the Atlanta Integrated Water Resources Plan (IWRP). This Plan incorporated project recommendations from the 3 completed master plans into an integrated Capital Improvement Program (CIP) as part of a transition into a 5-year rolling CIP. Due to the adverse revenue impacts associated with the coronavirus pandemic and an uncertain economic recovery, the team was dealing with a significantly reduced budget for CIP projects. They needed an optimization model that would maximize triple bottom line (TBL) and risk reduction benefits from the multitude of potential water, wastewater, and stormwater projects, while meeting the budget limitations.

Project Scope

Annual CIP budgetary limitations were arrived at by taking into account committed project expenditures for various scenarios such as Consent Decree projects, annual projects typically funded with CIP rather than operational funds, and an allowance for emergency or unplanned spending. TBL and risk reduction criteria were developed by DWM personnel along with specific scoring plans in order to enable consistent scoring. Project benefits were then assigned to each CIP project based on either TBL benefits or risk reduction benefits.

In order to run model simulations making use of the AssetAdvanced™ Project Scheduling Module, various inputs were arrived at including:

ENVIRONMENTAL	ECONOMIC	SOCIAL EQUITY
<p>Regulatory: Meet existing or anticipated regulatory requirements to enhance protection of the environment and public health.</p>	<p>Funding: Provide effective utility funding solutions that minimize adverse rate impacts for customers.</p>	<p>Safety & Security: Reduce health/safety/security impacts to customers, visitors, and personnel.</p>
<p>Reliability: Provide sustainable energy/natural resource utilization or operational redundancy to reduce costs and/or risk of failure.</p>	<p>Smart Utility Compliant: Implement more accurate, real-time data monitoring to proactively identify and resolve issues, complaints, and inefficiencies.</p>	<p>Customer: Enhance community facilities and aesthetics with minimal adverse impacts on customers or the public.</p>
		<p>Environmental Justice: Correct or mitigate existing or past level of service inequities for low-income or disadvantaged communities.</p>

Table 1: Sample of Atlanta IWRP Water & Wastewater TBL Criteria



Project data



Schedule constraints

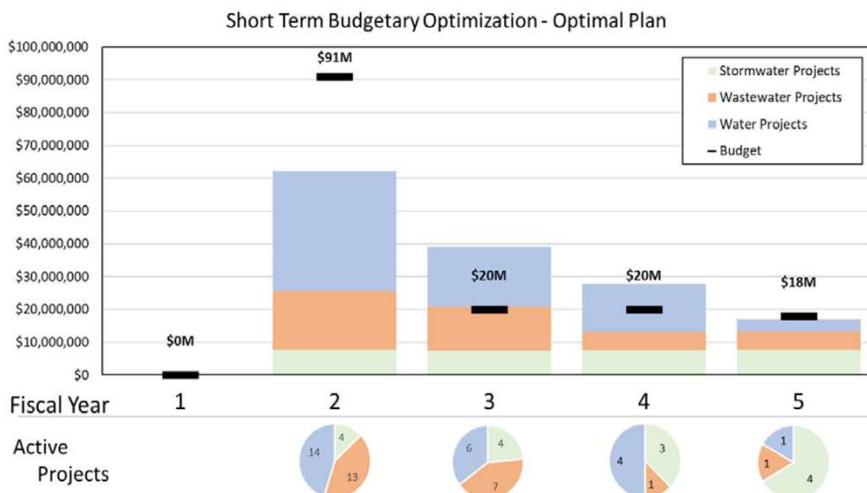


Budget constraints

Results from the AssetAdvanced™ model simulations were used to evaluate scenario plans based on budget, cumulative TBL benefit, and cumulative risk reduction benefit. Due to budgetary constraints, only the most critical CIP projects were able to be considered. They were analyzed using three factors: regulatory compliance, single point of failure, and positive revenue impact.

Results

The optimal plan selected from the AssetAdvanced™ Project Scheduling Module had the best TBL benefit score and the best risk reduction score while leaving over \$10M in unspent budget over the 10-year planning period. Other plans considered spent more of the budget but had lower TBL and risk reduction scores. The City will run the model on a routine basis, updating the TBL and risk reduction scores as needed.



With the alternative being a process that is more subjective, it was discovered that using a more formalized process for evaluating and selecting projects fostered more consistency and accuracy. Further, the use of the AssetAdvanced™ Project Scheduling Module allows the most beneficial and economic projects to be selected for implementation.

Figure 1: Atlanta IWRP Selected AssetAdvanced™ Initial 5-Year Rolling CIP Budget

