PA Consulting Group

# SAN ANTONIO WATER SYSTEM

## Organization Efficiency Study

September 30, 2013

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PA Consulting Group

405 Lexington Ave
New York, NY 10174
United States
Tel: 212-973-2900

www.paconsulting.com

September 30, 2013

Mr. Robert R. Puente
President/Chief Executive Officer
San Antonio Water System
2800 U.S. Hwy 281 North
San Antonio, Texas 78212

Dear Mr. Puente,

PA Consulting Group, Inc. (PA) is pleased to present to the San Antonio Water System (SAWS) our Final Report (Report) containing findings and recommendations from our Organizational Efficiency Study (Study). The objective of this Study was to identify specific areas where SAWS could improve its operational efficiency and reduce costs, while maintaining or improving service levels.

Overall, PA has found SAWS to be well managed and operates as well as, or better than, its industry peers in most functional areas. PA has identified a number of areas for potential improvements and cost savings. PA would characterize these improvements as operational in nature. Implementing all recommendations is expected to result in savings of approximately $8.3 million in annual operations and maintenances expenditures in 2015 increasing to $12.9 million in 2019. Implementing certain recommendations will also require SAWS to make investments in business process changes and technology modifications. Factoring investments, the Net Present Value (NPV) of our recommendations is calculated to be approximately $45 million[1].

PA has made its best effort to perform the analyses and prepare our Report given the available time of ninety days. Given that the scope of our effort was broad, we did not conduct an exhaustive analysis of all aspects of SAWS. Such an effort would require time and resources beyond the original scope of work and budget.

Statements made by PA relating to the services, and all surveys, forecasts, recommendations and opinions (collectively "Forecasts") in the Report, presentations, or other communications are made in good faith on the basis of information available at the time of the Report's preparation. Such Forecasts are addressed only to SAWS. Although PA has used reasonable skill and care in the preparation of such Forecasts, they cannot be considered a representation, undertaking, or warranty as to outcome or achievable results.

In conducting this study, PA used a systematic and comprehensive approach for analyzing efficiency (costs) and effectiveness (service levels). PA's body of work is based on facts, explanations, and limitations as further described in the Report. While the Report does not

[1] Cost of Capital at 5%; Inflation Rate at 2.5%; Time period from January 1, 2015 to December 31, 2019; Investments in 2014

exhaustively detail all of the work performed by PA, it explains the relevant approach and methodology behind our assessment and recommendations. Our assessment included the following five areas:

- Water Management,
- Customer Service,
- Engineering and Construction,
- Operations, and
- Shared Services

Our analysis utilized a variety of methods to gather the data and information needed to perform the analysis, make observations, and quantify efficiency-related recommendations. PA conducted interviews with key management and employees of SAWS, carried out site visits to major operations facilities, reviewed key planning, financial, and operating documents, and analyzed recent and relevant operating data and information. PA also utilized data from utilities across the nation within its proprietary benchmarking databases to comparatively analyze performance in the Customer Service and Shared Services areas. In addition, PA conducted interviews with a number of other water and wastewater utilities in the US to compare and contrast SAWS against its Water Management, Operations, and Engineering and Construction policies, processes, and organizational structures.

PA appreciates the assistance provided by SAWS and its employees in conducting this study. We found SAWS and its employees to be very open, extremely responsive to our data needs, and flexible in making themselves available for in-person or telephone interviews. As a result, PA was able to conduct approximately 150 interviews and review over 100 pieces of data and documents provided by SAWS. PA also consulted with members of the City of San Antonio's City Council and City staff, and appreciates their interest in this Study.

PA enjoyed the opportunity to work with SAWS and its employees. In particular, we wish to express our thanks chiefly to you, as President and CEO, as well as to all members of the SAWS Executive Management Team for being fully engaged in reviewing the analysis, observations, and recommendations of this Study. We would also like to thank Mr. Donovan Burton and Mr. Dan Crowley for efficiently and diligently managing this study and seamlessly coordinating interviews and data responses.

Should you have any questions concerning this study, please do not hesitate to contact me.

Sincerely,
PA Consulting Group, Inc.

Arun Mani

Member of PA's Management Group

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# EXECUTIVE SUMMARY

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# EXECUTIVE SUMMARY

## Introduction

### San Antonio Water System (SAWS) is one of the largest and most complex water and wastewater systems in the United States. The municipally-owned utility serves a customer base of 1.6 million customers that grows an additional 2% each year, as San Antonio becomes one of the fastest growing cities in the U.S.[1]

While SAWS is recognized as an industry leader in water management, the public utility has faced a number of challenges to managing its water resources. The severe drought in Texas over the past three years lowered the Edwards Aquifer severely enough to force SAWS to implement almost perpetual Stage 2 drought restrictions, with levels in summer almost dipping low enough to move into Stage 3.

In addition, during negotiations of its Consent Decree (CD) with the United States Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ) during 2008-2012, SAWS operating and capital expenditures associated with reduction of sanitary sewer overflows (SSOs) averaged approximately $60 million per year. The cost to perform the requirements of the CD are estimated to be approximately $500 million more than the total of the average annual expenditures SAWS would have made in its sewer system to reduce SSOs during the ten to twelve year term of the CD. To carry out these responsibilities, the utility faces an immediate increase in its typical workload by almost 40 percent in the next fifteen months and must submit regular progress reports over the entire ten to twelve year term for compliance with the CD. SAWS is also going through a period of change with the integration of the former Bexar Metropolitan Water District. With this integration, SAWS has had to adjust to a new work force and new infrastructure. SAWS would like to ensure that its performance continues to the highest standard given these changes.

To meet these challenges, SAWS wished to ensure that their system is operating at the highest level of performance. In the summer of 2013, SAWS engaged a consultant with substantial experience in organization-wide efficiency reviews of large water and/or wastewater utilities to perform a system-wide efficiency review. Specifically, management desired a review that would examine performance benchmarks used by other similarly situated utilities, assess the SAWS organization relative to these

[1] U.S. Census Bureau

benchmarks, and recommend implementation of appropriate operational efficiencies and cost saving measures.

**Table 1: SAWS system statistics**

| | SAWS (before DSP) | Combined w/DSP |
|---|---|---|
| Connections – Water | 365,000 | 462,000 |
| Connections - Sewer | 412,000 | 412,000 |
| Customers | 1.2 million | 1.6 million |
| Metered Usage (2012) Millions of Gals | 55,320 | 66,145 |
| Area | 642 sq. miles | 914 sq. miles |
| Miles of Water Main | 5,131 | 6,531 |
| Wells | 143 | 213 |
| Pump Stations | 117 | 286 |
| Storage Tanks | 80 | 146 |
| Miles of Sewer Main | 5,180 | 5,180 |
| Treated – Sewer Millions of Gals | 49,055 | 49,055 |

## Consulting Team Overview

PA Consulting Group, Inc. (PA), a leading international management and technology consulting firm, was selected to conduct this review. Established over 70 years ago with currently more than 2,500 employees operating from 24 offices around the world, PA has a dedicated energy and water practice with deep water and wastewater sector experience. In addition, PA has industry-leading utility sector proprietary benchmarking programs for Customer Service and Shared Services. These programs provide PA with unique insights into the costs and performance of a wide array of standard utility processes.

PA specializes in both independent assessments as well as business transformation. Around the world, PA has helped various water and wastewater utilities evaluate their financial performance and regulatory (rate-case) strategy, develop their Capital Improvement Plan, benchmark their shared services management, and perform business unit and management audits. For this project, PA assembled a team that included experts from two other firms, EBA Engineering Inc., and Intel Business Solutions, LLC, to leverage specific skill sets required to analyze various issues anticipated in the assignment.

## Approach

PA employed a methodical, fact based approach for conducting this review that was comprised of four main phases:


At the start of the engagement, PA held a kick-off meeting at which SAWS presented a comprehensive overview of its organization, performance results, opportunities, and challenges. The Technical Review phase included the majority of the data gathering, research, modeling, benchmarking, and other analysis.

Initial findings and conclusions were presented to the appropriate SAWS staff in phase three, along with supporting data and analyses for the purpose of validating the underlying data and obtaining initial feedback. This process assured that a thorough and comprehensive assessment was undertaken, and that issues were properly evaluated and documented. Lastly, PA prepared, vetted, and submitted its report based upon the validated findings and conclusions.

## Methodology

From PA's perspectives, there are *Three Ps* to utilize when evaluating efficiency opportunities. Our recommendations and savings were quantified based on the existing operational state of these areas within SAWS and potential opportunities as outlined below:

- *Policy Evaluation:* Over time, utilities build legacy policies that impact overall productivity. Challenging some of the institutional policies often results in efficiency gains as significant numbers of work steps can be cut from major business processes, thus reducing labor requirements while simultaneously improving the time available to perform that major process.
- *Position Changes:* The bureaucratic nature of utilities combined with siloed organization structures contribute to inefficiencies. In addition, most utilities over time have a natural tendency to become stale and complacent because of the style of individuals with a lengthy tenure operating in specific job functions. A reshuffle of people and positions often leads to increased inventiveness and collaboration, which positively impacts efficiency.
- *Process Improvements:* Extensive work processes are characterized by excessive administrative requirements and set-up tasks that limit actual job productivity. Whether business process improvements coupled with effectively utilizing technology could deliver lasting value should be determined.

## Scope of Work

In conducting this study, PA focused on the areas that collectively have the greatest impact on the overall costs and performance of a water and wastewater utility:

1. Water Management (Water Resources and Conservation)
2. Customer Service
3. Engineering and Construction (E&C)
4. Operations (Production Treatment, Distribution and Collection, Operations)
5. Shared Services
   - Communications and Advertising and Governmental Affairs (collectively under Public Affairs),
   - Facilities,
   - Finance,
   - Fleet,
   - Health & Safety,
   - Human Resources,
   - Information Services,
   - Legal,
   - Security, and
   - Supply Chain Management.

Recommendations were made in each area based on analysis of the knowledge and information gained through the assessment. In certain cases, it was easier to apply benchmarking results to quantify projected benefits, such as in Customer Service and Shared Services, whereas in more subjective areas, such as Water Management, Operations, and E&C, recommendations were based on the consulting team's professional opinion as well as interviews with other utilities.

## Overall Findings

The overall organization structure of SAWS is a formal hierarchy with clearly established departments and leaders that provide a clear understanding of authority levels and responsibilities, as well as delegation and lines of command. Groups within SAWS also exhibit characteristics of typical functional, departmental, and matrix structures. The structure helps facilitate efficiency through specialized sets of tasks that focus on fulfilling specific responsibilities. While some of the specific organizational structures at SAWS vary from other water and wastewater utilities, there is no evidence that these differences lead to any organizational deficiency. This pattern was found to generally be the case across the five areas reviewed in the study.

Each of the five groups has areas of excellence as well as potential opportunities. These are summarized below in Table 2:

**Table 2: Key findings by department**

| Department | Areas of Excellence | Potential Opportunities |
|---|---|---|
| **Water Management** | • *Successful water resource planning – flexible portfolio of diverse water resource options*<br>• *Providing uninterrupted water supply to BexarMet customers which would have been challenging especially in the ongoing drought conditions in the absence of a merger of the utilities*<br>• *Nationally recognized conservation programs* | • *Improved management efficiencies*<br>• *Focus on core water management activities – water testing activities can be consolidated with Operations*<br>• *Rate mechanism that uses a drought pricing surcharge could be an effective mechanism for improving drought reduction compliance in addition to relying upon block rate pricing* |
| **Customer Service** | • *Meter reading and field service-sub-functions display first quartile cost performance* | • *Improvements in Customer Contact Center - reduction in call volume, improved call handling, and introduction of technology*<br>• *Handling exception-related billings – changes to bill generation parameters*<br>• *Credit and collections metrics – delinquent customers and disconnects*<br>• *Key Performance Indicators (KPI) and smart analytics for predictive modeling*<br>• *Website – limited customer utilization to reduce calls*<br>• *Innovation and customer service expertise* |

| Department | Areas of Excellence | Potential Opportunities |
|---|---|---|
| **Engineering and Construction** | • *Effective prioritization of capital projects – transparent, well designed, and documented*<br>• *Strategic management of government contracts – specialized Government Engineering Group*<br>• *Strong governance in vendor management – selection and change order management*<br>• *Ability to stay within project budgets*<br>• *Sensible investment has resulted in fewer wastewater-related incidents* | • *Lack of automation and technology to track infrastructure projects and reliability*<br>• *Improved cross-functional coordination and communication – project handoffs and design input*<br>• *Efficiency of Support Functions – GIS Mapping and Backflow Prevention*<br>• *Improved project prioritization and asset management* |
| **Operations** | • *Clear oversight of end-to-end operations*<br>• *Good personnel and infrastructure integration with BexarMet*<br>• *Demonstrates innovation outside core business on the energy side, water and solids recycling programs* | • *Managing chemical spending*<br>• *Managing Non Revenue Water losses*<br>• *Automated Metering Infrastructure – teaming up with CPSE* |
| **Shared Services** | • *Facilities: Recognizes the need to reconsider existing facilities*<br>• *Finance: Strong financial position and lean organization*<br>• *Human Resources: Proactively managing challenging Pension, Health and Benefits Issues; Employees indicate high job satisfaction*<br>• *Information Services: Excellent levels of technology systems availability, reliability, and security*<br>• *Legal: Legal team is integrated in decisions, allowing for collaboration*<br>• *Public Affairs: Development of key relationships through public affairs*<br>• *Security: Improved roles for security staff*<br>• *Supply Chain: Competitive and inclusive bidding process; Shortened the time between contract approval and construction start* | • *Facilities: Overall maintenance and management strategy; exploring energy efficiency opportunities*<br>• *Finance: Conservative debt portfolio*<br>• *Fleet: Investigate utilization of vehicles; evaluate vehicle policies and procedures*<br>• *Human Resources: Evaluate Training and Development policies*<br>• *Information Services: Data management and reporting; Need for strategic view versus a tactical approach for non-CIP technology work; Contractors filling in as full-time employees; Evaluate Governance and Program Management Office (PMO)*<br>• *Legal: Development of Key Performance Indicators*<br>• *Public Affairs: Evaluate organizational realignment; Better utilization of technology*<br>• *Safety: Lack of claims loss reports*<br>• *Security: Renegotiating guard contract* |

## Major Recommendations

PA has identified a number of areas for potential improvements and cost savings across the five broad areas that are described in each of the chapters. The Tables below (Table 3 to Table 7) summarize key recommendations and the expected annual O&M benefits from each area. PA would characterize these improvements as operational in nature. Implementing all recommendations is expected to result in savings of approximately $8.3 million in annual operations and maintenances expenditures in 2015 increasing to $12.9 million in 2019. PA recommends that any personnel reduction or redirection as a result of this effort be conducted in a non-disruptive manner over an 18-month period starting from the time of implementation, which is assumed to be January 1, 2014.

**Table 3: Water Management recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Permanently eliminate a current vacant managerial position. | Positions | $138,000 due to a strategic decision to not increase management size in this area. |
| | **Total savings** | | **$138,000*** |

**Table 4: Customer Service recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Consolidate management positions | Positions | $324,000 from consolidation of management and administrative responsibilities |
| 2 | Improve call handling and technology in contact center | Process | $441,000 from process and call handling improvement and increased technology utilization to reduce live calls |
| 3 | Reduce volume of bills | Process | $147,000 from a reduction in the volume of exceptions and post mail processing |
| 4 | Reduce delinquency processing | Process | $196,000 from reduced number of customers to process because of a lower delinquency rate |
| 5 | Implement KPIs and improve reporting | Process | $147,000 from performance improvements, performance measurement and improved reporting |
| 6 | Close customer payment centers | Policy | $252,000 to $1.1 million from closure of one or more customer payment centers |
| | **Total savings** | | **$1,507,000*** |

**Table 5: Engineering & Construction recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Implement a Capital Project Management System (CPMS) | Positions | $229,000 due to technology related efficiencies |

| | | | |
|---|---|---|---|
| 2. | Improve coordination and communication among sub-functions | Process | $210,000 due to improved coordination due to business process modifications |
| 3 | Eliminate double entry of data | Positions | $150,000 due reduced data entry requirements. |
| | **Total savings** | | **$589,000*** |

**Table 6: Operations recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Consolidate all water quality functions under single management | Positions | $156,000 due to organization management consolidation |
| 2. | Improve productivity in electrical maintenance area | Process | $216,000 due to increased productivity through process improvements and permanent eliminations of vacancies |
| 3 | Reduce ferrous sulfate usage | Process | $320,000 due to reduction in quantity of chemical used |
| 4 | Implementing a valve exercising program | Process | $2.3 million (assumed to be achieved incrementally at a growth of 20% or $460,000 each year between 2015 and 2019 reaching $2.3 million in 2019) |
| 5 | Implement 24-hour working supervision of the Emergency Operations Center (EOC) and SCADA controls area | Process | $100,000 in productivity improvements |
| | **Total savings** | | **$1,252,000** in annual O&M costs*** |

- **$1,252,000 includes the first year of savings through valve exercising program. As this is expected to grow each year to reach $2.3 million in Year 5, annual savings in Year 5 are calculated to be approximately $3 million.

**Table 7: Shared Services recommendations and expected savings**

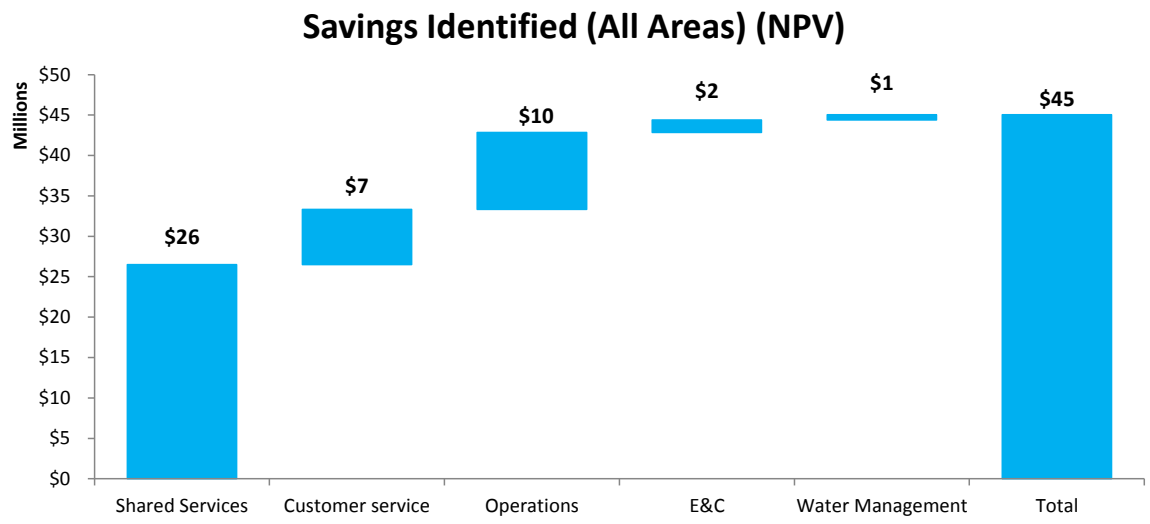
| # | Recommendation | Type | Expected Annual O&M Savings | Shared Service |
|---|---|---|---|---|
| 1 | Outsource custodial services and improve productivity | Positions | $100,000 in potential savings through outsourcing and improved productivity. | Facilities |
| 2 | Evaluate business case for improved energy | Process | $80,000 due to reduced energy spending which should increase as SAWS replaces older | Facilities |

| # | Recommendation | Type | Expected Annual O&M Savings | Shared Service |
|---|---|---|---|---|
| | management | | inefficient service centers with new construction. | |
| 3 | Decreasing Days of Operating Cash | Policy | A modest, gradual reduction to 270 days from the current level of 342 would free up approximately $48 million to be directed toward future capital improvements. Assuming a 5% borrowing rate, this reduction would generate additional interest savings of approximately $2.4 million per year (assuming $2.4 million in annual savings from 2016 to 2019). | Finance |
| 4 | Rationalize vehicles and sell surplus stock | Policy | $750,000 in one time revenues. | Fleet |
| 5 | Avoided maintenance costs due to reduced fleet size | Process | $75,000 in annual avoided maintenance savings. | Fleet |
| 6 | Improve maintenance staff to vehicles ratio | Positions | $271,000 in potential savings through improved productivity. | Fleet |
| 7 | Reduce total training staff across the company | Positions | $384,000 in potential savings through increased productivity | Human Resources |
| 8 | Reduce external vendor spend | Policy | $104,000 in potential savings through course rationalization | Human Resources |
| 9 | Eliminate contractor positions and fill with full time employees | Positions | $981,000 due to replacing contractors with full time employees | Information Services |
| 10 | ERSS CSS Cobol support to be removed | Positions | $327,000 due to permanent elimination of personnel | Information Services |
| 11 | Improve alignment among public affairs responsibilities | Positions | $411,000 through better alignment and improved productivity | Public Affairs |
| 12 | Re-evaluate survey costs | Process | $40,000 through fewer surveys | Public Affairs |
| 13 | Combine Safety and Environmental Health, Claims, and Risk Management under single management | Positions | $319,000 in potential savings through organization restructuring and improved productivity | Safety and Environmental Health |
| 14 | Renegotiate security | Positions | $420,000 in potential savings through | Security |

| # | Recommendation | Type | Expected Annual O&M Savings | Shared Service |
|---|---|---|---|---|
| | contract | | renegotiation of contract for different coverage levels | |
| 15 | Realign security staff roles | Process | $75,000 due to improved productivity | Security |
| 16 | Combine Management of Purchasing, Supply, and Contracts | Positions | $192,000 in potential savings through organization restructuring | Supply Chain Management |
| 17 | Implement a Capital Project Management System | Process | $85,000 in productivity savings due to reduced manual processing | Supply Chain Management |
| | **Total savings** | | **$3,900 in 2015; $6,300 from 2016 onwards** | |

## Net Present Value

Implementing certain recommendations will also require SAWS to make certain one-time investments in business process changes and technology modifications. Factoring investments, the Net Present Value (NPV) of our recommendations is calculated to be approximately $45 million[2].




NPV is calculated under the following assumptions

- Steady state timeframe of January 1, 2015
- Benefits accrued between January 1, 2015 and December 31, 2019
- Discount rate of 5%.
- Inflation rate of 2.5%.

[2] Cost of Capital at 5%; Inflation Rate at 2.5%; Time period from January 1, 2015 to December 31, 2019; Investments in 2014

- One time investment of $2,745,000 as described below:
  - Water Management; $0
  - Customer Service:  $160,000
    - Assumes one time investment of $400,000 towards process and technology related investments for retaining external experts to assist with process changes and an upgrade to the SAWS website.
    - Assumes sale value of $240,000 from one customer service facility that will be used to pay for a portion of the investment.
  - Engineering and Construction: $1,200,000
    - Investment for a Capital Program Management System.
  - Operations: $500,000
    - Investment for a valve exercising program.
  - Shared Services: $885,000
    - $535,000 for Building Management System (Facilities)
    - $300,000 for external assistance (Information Services)
    - $50,000 for construction of new gates and remote access for facilitating guard contract changes

## SAWS Continuous Improvement Culture

Based on our work with SAWS over the last few months, we have observed that SAWS has a noteworthy continuous improvement culture and has a dedicated innovation and efficiency department.  In our interviews we found employees were motivated to work more efficiently and helped to identify areas for further examination.  PA is optimistic that SAWS has the ability to carry out the recommended efficiency improvements that will benefit current and future residents of the City of San Antonio.

# OVERVIEW

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# 1 OVERVIEW

## 1.1 Introduction

In 1992, the San Antonio City Council determined that it was in the best interest of the citizens of the City and the customers served by the water and wastewater systems to consolidate all water-related systems, functions, agencies, and activities into a single, unified agency.

This action was taken due to the myriad of issues confronting the City of San Antonio (City) related to the development, management, and protection of its water resources. The consolidation provided the City a singular voice of representation when promoting or defending the City's goals and objectives for water resource protection, planning, and development when dealing with local, regional, state, and federal water authorities and officials.

Ordinance No. 75686 (System Ordinance) approved the creation of the San Antonio Water System (SAWS), a single unified system consisting of the City's existing waterworks (formerly the City Water Board), wastewater, and water reuse systems (formerly departments of the City), together with all future improvements, additions, and replacements.

Similar to many municipal utilities in the United States, SAWS is a monopoly, and so consumers within SAWS service territories have limited choices with respect to selecting suppliers for their water and wastewater services. However, the elected representatives of the City Council appoint the SAWS Board of Trustees and retain decision-making authority over water and wastewater rates, as well as other fees. Therefore, in making decisions, SAWS' underlying financial and organizational policies are shaped by the combination of the area's natural resources, community policy-makers and elected leaders, and its mission to provide sustainable, affordable water services to the San Antonio community.

### 1.1.1 Environmental Operating Conditions

San Antonio and Bexar County are unique compared to other parts of the U.S. with respect to the confluence of soil types and environmental factors, which increases the complexity of infrastructure.

Soil types range from shallow and very rocky in the north, deep sands in the south, heavy clay soils in the east and central portions, and moderate caliche clays in the west. Proximity to the Gulf Coast to the southeast and dry arid areas to the west provide weather extremes ranging from extremely hot and dry to temperate, moist breezes and tropical weather systems. Clay soils, combined with dry and wet weather, create stresses on water mains that often result in spikes of main break activity during the warm months of the year. In dry years, water losses tend to spike due to increases in main break activity as well as increased customer demand, especially for outdoor irrigation.

Periods of drought also deeply affect SAWS water supply and strategic planning. Severe droughts can trigger strict usage limitations on Edwards Aquifer water, and customers may incur drought surcharges if the drought conditions are severe enough and their usage surpasses a certain amount. Because drought is unpredictable, SAWS plans for the event of both long-term and short-term drought conditions.

### 1.1.2 BexarMet Merger and Integration

The Bexar Metropolitan Water District (BMWD or BexarMet) was created in 1945 by the 49th Texas Legislature, to serve anticipated growth in Bexar County. From an initial account base of 4,765 primarily residential accounts, it grew to more than 92,000 residential and commercial accounts served in 2011 and employed about 249 employees at the time of the merger with SAWS. Over several years, repeated customer complaints about inadequate service, alleged mismanagement, and excessive rates resulted in legislative intervention in 2007.

SAWS assumed responsibility for BexarMet water services, responsibilities, and liabilities as a part of Senate Bill 341, enacted in 2011. This bill established several key measures including the immediate monitoring and review of BexarMet operations by the TCEQ. The primary component of SB 341, however, called for conducting an election by BexarMet ratepayers to vote on the dissolution of BexarMet and consolidation with SAWS. The election was held in November 2011, and BexarMet ratepayers voted in favor of dissolution.

Under the bill, SAWS is to fully integrate BexarMet by 2017, and so SAWS is currently in a transition period to smoothly integrate the two utilities to comply with this bill and take advantage of potential synergies. These synergies include improved contract pricing, consolidated billing, elimination of certain contracts, elimination of duplicate infrastructure (in certain instances), coordinated water supply planning, personnel consolidation, etc.

As the SAWS and BMWD systems were initially operated differently from each other, the original SAWS system assets and the BMWD assets have different components. The former BMWD also had numerous isolated water systems, along with a different SCADA system, presenting initial challenges to the integration efforts between the two entities.

At the time of this report, SAWS had successfully relocated DSP staff, integrated all information technology systems, integrated former BexarMet customers, and converted some BexarMet positions into SAWS. However, the utility merger between SAWS and BexarMet has inevitably changed the dynamic of SAWS, and the state of integration is still in flux.

## 1.2 System Overview

SAWS is one of the largest and most complex water and wastewater systems in the US. The table below provides an overview of the system characteristics.

| | SAWS (before DSP) | Combined w/DSP |
|---|---|---|
| Connections - Water | 365,000 | 462,000 |
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| Customers | 1.2 million | 1.6 million |
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| Area | 642 sq. miles | 914 sq. miles |
| Miles of Water Main | 5,131 | 6,531 |
| Wells | 143 | 213 |
| Pump Stations | 117 | 286 |
| Storage Tanks | 80 | 146 |
| Miles of Sewer Main | 5,180 | 5,180 |
| Treated – Sewer Millions of Gals | 49,055 | 49,055 |

## 1.3 Core Businesses

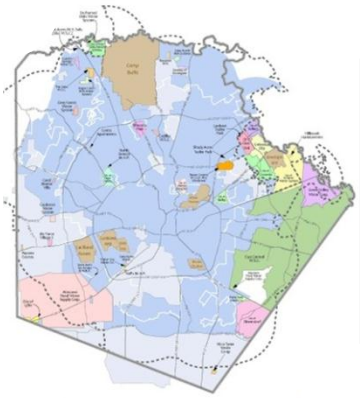
SAWS serves approximately 1.6 million people in the San Antonio/Bexar County area, operating four core businesses:

### 1.3.1 Water Delivery

The Water Delivery core business delivers water to approximately 462,000 customers within 914 square miles through approximately 6,500 miles of distribution piping. The main source of water is from the Edwards Aquifer.

The potable water distribution system also utilizes 26 elevated storage tanks and 38 ground storage reservoirs, with combined storage capacities of 209 million gallons.

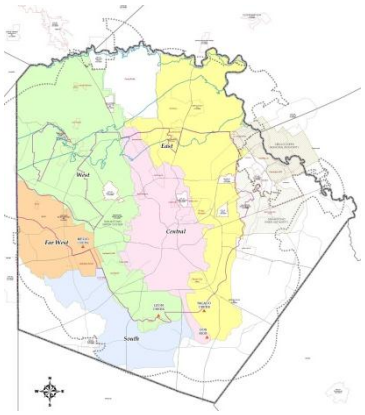
**Figure 1: SAWS water service area**



### 1.3.2 Wastewater Service

SAWS collects and treats the wastewater produced by approximately 412,000 residential and commercial customers in 722 square miles of service territory. On an annual basis, it treats about 49 billion gallons of wastewater. The system has three major treatment facilities/water recycling centers: Medio Creek, Leon Creek, and Dos Rios. In addition, SAWS is also responsible for monitoring wastewater discharged by large industrial systems into the wastewater collection system. An EPA Consent Decree was lodged in Federal District Court in San Antonio Texas, in June 2013, which requires strict adherence to specific actions and timelines for the components of the wastewater collection system.

**Figure 2: SAWS wastewater service area**



## 1.3.3 Water Supply

Using a combination of conservation tactics as well as a water resource strategy, the Water Supply core business ensures that the community of San Antonio has a sustainable water resource for future generations. Its responsibilities include analysis of each water supply alternative available for meeting future needs and demonstrating SAWS' commitment to obtaining additional water supplies.

Since 2004, SAWS has increased its supply by 39%. The most current policy/strategic plan from Water Supply is the *2012 Water Management Plan*, which outlines a diversified foundation for the City's water supply, emphasizing alternative water sources, recycled water, and the use of the Aquifer Storage & Recovery (ASR) facility.

The ASR project is the third largest ASR system in the country, with almost 100,000 acre feet of storage at one time prior to the region's present drought. It has the capability to pump water to and from the Carrizo Aquifer. Construction of a brackish water desalination plant is also underway which will add an additional 33 acre feet of water a day to current water supplies in the first phase. When all phases are complete, the desalination plant will be capable of adding over 90 acre-feet of water a day to current water supplies.

SAWS has also been internationally recognized for its water conservation techniques that include drought management measures, indoor and outdoor programs and rebates, and commercial conservation incentives.

As of December 2012, the System's water supply includes the following:

- Edwards Aquifer, 260,310 acre-feet, which represents 58% of the System's total supply;
- Aquifer Storage and Recovery underground storage, 94,939 acre-feet, which represents 21% of total supply;
- Recycled Water to CPS Energy, 50,000 acre-feet, which represents 11% of total supply;
- Recycled Water to other customers, 25,000 acre-feet, which represents 6% of total supply;
- Canyon Lake, 8,500 acre-feet, which represents 2% of total supply;
- Carrizo Aquifer, 6,400 acre-feet, which represents 1% of total supply; and
- Trinity Aquifer, 3,500 acre-feet, which represents slightly less than 1% of total supply.

SAWS also serves its customers with water supplies associated with the DSP which are not included in the sources outlined above.

### 1.3.4 Chilled Water and Steam System

Six thermal energy facilities in the Downtown and Port San Antonio areas provide chilled water and steam for heating, ventilation, and air conditioning (HVAC) purposes in commercial buildings and industrial spaces including downtown hotels, San Antonio convention center facilities, Hemisfair Plaza, the Alamodome, and the Port Authority of San Antonio.

The chilled water and steam system is one of the largest producers of chilled water in south Texas. The chilled water and steam system had gross revenues of $12.4 million in Fiscal Year 2012.

The System is in the process of phasing out its steam services in the City's downtown area, which the System expects to occur gradually over an approximately five-year period. The System anticipates this action to have a positive financial impact as a result of operational costs savings outweighing any resultant loss in revenues.

## 1.4 Recycled Water

The San Antonio Water System has the largest direct water recycling delivery system in the United States, which recycles highly treated effluent water from wastewater treatment plants. The system provides approximately 25,000 acre-feet or 22 million gallons a day to end-users such as golf courses, parks, industrial and commercial customers, and the San Antonio River Walk. This use of recycled water protects potable water from other sources such as the Edwards Aquifer.

As part of the wastewater treatment/recycled water process, biosolids are created as a by-product, which are used for composting and soil conditioning. The methane gases from the biosolids are also captured to produce heat and power and for commercial sale on the open natural gas market.

## 1.5 Financial Structure

### 1.5.1 Sources of Funds

The main sources of funds are from operating revenues from the sale of water services, wastewater services, and chilled water services. SAWS also budgets for funding from non-operating revenues (mainly interest) and draw on equity from fund balances. SAWS funding does not come from other sources, such as tax revenue or transfers from the City. In 2013, total sources of funds are projected to be around $501.0 million, an increase of 9.0% over the 2012 budget of $459.5 million.

### 1.5.2 Uses of Funds

A breakdown of SAWS 2013 amended budget is shown below. In addition to debt service fees and operation and maintenance expenses, SAWS allocates a certain percent for infrastructure renewal and replacement, and is required to transfer a little over two percent of revenues back to the City of San Antonio.

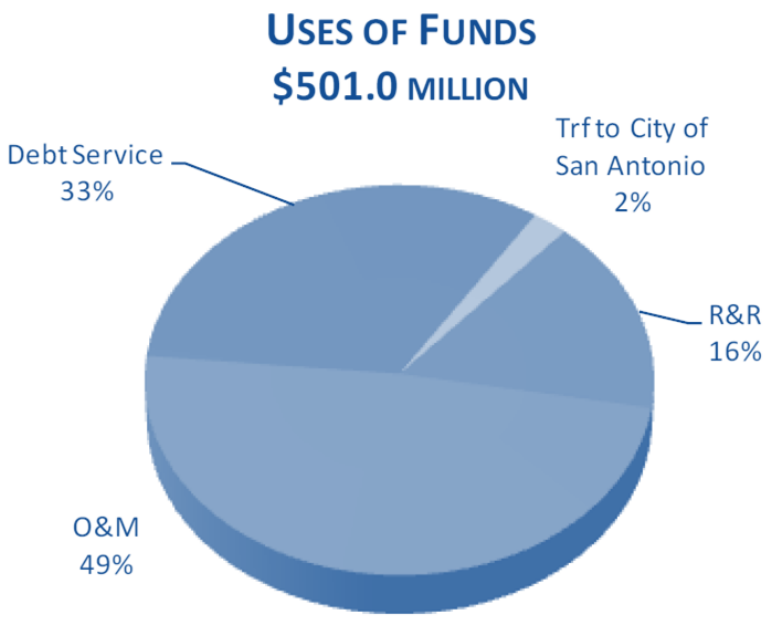
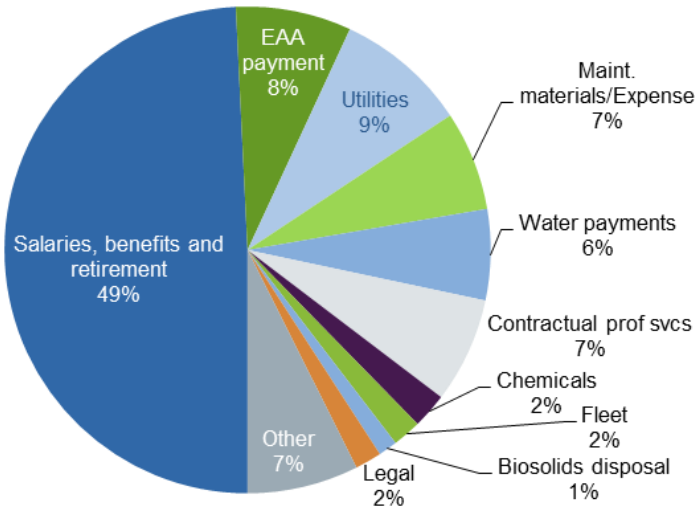



**Figure 3: Breakdown of operations**

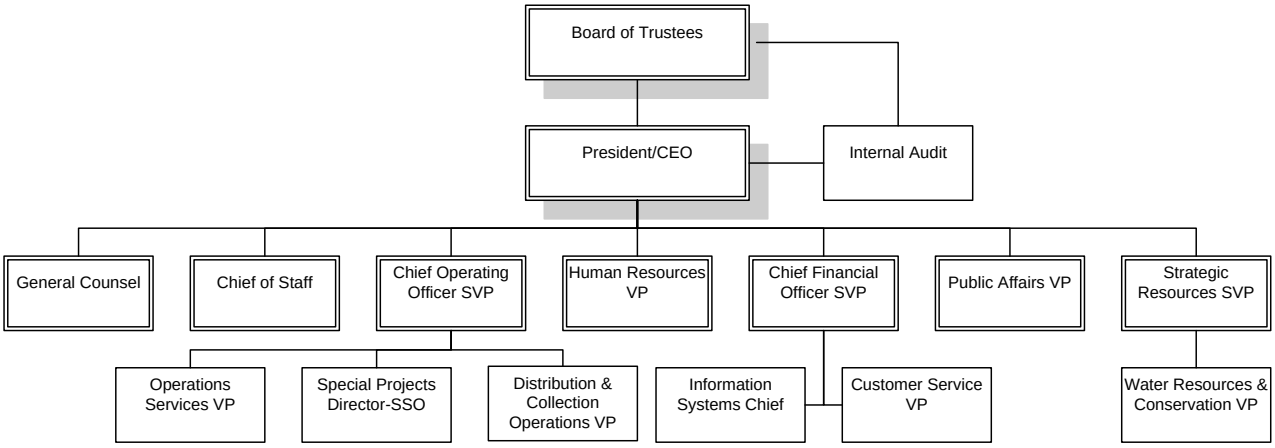
A breakdown of the operations and maintenance portion of the uses of funds is shown below.




| $ millions | O and M |
|---|---|
| Salaries, benefits and retirement | $137.0 |
| EAA payment | 21.4 |
| Utilities | 24.4 |
| Maint. materials/Expense | 18.4 |
| Water payments | 16.8 |
| Contractual prof svcs | 19.5 |
| Chemicals | 6.5 |
| Fleet | 5.3 |
| Biosolids disposal | 3.5 |
| Legal | 4.9 |
| Other | 20.6 |
| **Total SAWS (before capitalization)** | **$278.3** |
| Capitalized costs | (34.3) |
| **Total SAWS (after capitalization)** | **$243.9** |

## 1.6 Organizational Structure

A high-level overview of SAWS' organizational structure is shown below:




SAWS is governed by the SAWS Board of Trustees, who include the mayor and six members appointed by the City Council, and has the following management structure:

- The President/Chief Executive Officer (CEO) is responsible for overall management and leadership at SAWS. The President/CEO implements the policies set by the Board of Trustees to achieve SAWS mission and goals. Also reporting to the Board of Trustees is the Chief of Internal Audit.
- The Chief of Staff supports the CEO working with Senior Vice Presidents and Vice Presidents (VPs) to make decisions and ensure that projects meet deadlines and groups are operating efficiently as well as Board and CEO office matters.
- The Chief Operating Officer (COO) is responsible for operations related to the four core businesses at SAWS. The position oversees Operations, Operation Services, Distribution & Collection Operations, and Production &Treatment Operations.
- The Human Resources VP is responsible for overseeing recruitment, benefits, staffing, employee relations, training, and other human resources responsibilities at SAWS.
- The Chief Financial Officer (CFO) is responsible for the overall financial management of the System, which includes the Accounting, Financial Planning, Finance and Treasury, Purchasing, and Supply functions. The CFO also has responsibility for the Information Services and Customer Service functions. The Information Services function delivers a broad spectrum of applications and technology services and support to all areas of the System. Customer Service is responsible for providing the maintenance of customer accounts as well as accurate and timely billing of System customers.
- The Public Affairs VP is in charge of external and internal relations for SAWS, which includes the Intergovernmental and External Relations as well as Communications functions.
- The General Counsel/VP provides legal advice, researches legal issues, drafts legal memorandums for the Board and SAWS, and represents SAWS to customers, regulators, and business partners. It also oversees the Contracting, Claims, and Risk Management Departments.
- The Strategic Resources VP is responsible for infrastructure master planning, water resources, and engineering. This position oversees Engineering and Construction (development of CIP program) as well as the Water Resources (water supply projects) and Conservation departments.

## 1.7 Staffing

Currently, there are slightly less than 1,900 employees at SAWS, including remaining DSP staff. For the purposes of our analysis, we relied upon 2012 staffing data (count and payroll costs) and hence there will be minor discrepancies between PA's analysis and the current staffing levels and associated costs.

# BACKGROUND AND APPROACH

# CONTENTS

# 2 BACKGROUND AND APPROACH

## 2.1 Project Purpose

The San Antonio Water System (SAWS) wished to engage a consultant with substantial experience in the conduct of organization-wide efficiency reviews involving large water and/or wastewater utilities in order to perform a system-wide efficiency review of SAWS in an effort to ensure that the system is operating at the highest level of performance. Specifically, management desired a review that would look at performance benchmarks of other similarly situated utilities, assess the SAWS organization relative to those benchmarks, and recommend implementation of appropriate operational efficiencies and cost-saving measures.

In addition, in a memorandum dated January 16, 2013 during the examination of SAWS' rates and rate structures, the Public Utilities Staff (Staff) of the City of San Antonio Finance Department and SAWS staff recommended that SAWS conduct an efficiency study and allocate resources to a formal efficiency function to identify efficiency opportunities for the utility. The project was initiated in response to the Staff's recommendation.

## 2.2 The State of the US Water and Wastewater Industry

SAWS and other water and wastewater service providers across the United States face challenges ranging from aging infrastructure to aging workforces to increasing pressure from regulatory mandates. The majority of the expansive network of underground water and sewer infrastructure in the US was built nearly a century ago to serve a significantly smaller population. As the American population grows, with a forecasted population increase of 100 million residents by the middle of the 21st century, many water and wastewater utilities are searching for ways to improve their operations through enhanced efficiencies to provide some of the needed funding for improvements to their infrastructure while maintaining appropriate rates.

The Perfect Storm

Water utilities are facing pressure from a variety of different areas with increases in:

- Customer expectations, especially with new technology tools and evolving service standards in other utility sectors;
- Debt service requirements as a percentage of total revenue requirements due to the need for more capital investment to service aging assets, serve new development, and meet new federal and state mandates;
- Personnel costs, especially pension, health, and benefits in addition to direct labor;
- Energy and other commodity costs, such as chemicals, which make up a significant amount of a utility's non-labor costs; and
- Regulations, including state and federal mandates, which require significant capital investments.

At the same time, there is a decreasing:

- Appetite for significant rate increases to support utility operations;
- Availability of water (and consequently there exists the need to plan for new and costly sources of water supply);
- Amounts of federal and state grants and subsidies to assist with recovery of certain aspects of a utility's costs; and
- Demand or consumption due to fewer customers, conservation programs, or other weather related constraints.

Over the next 20 years, municipal water and wastewater system upgrades are estimated to cost between $2.5 and $4.8 trillion in the United States. Building and replacing water and sewer lines alone will cost approximately $660 billion to $1.1 trillion during that time.[3] Furthermore, continued investments for current regulatory mandates and investments for any new environmental legislation will also require billions of dollars over the next two decades. Consequently, water and wastewater utilities across the nation are increasingly evaluating cost reduction and other efficiency initiatives to look for ways to reduce costs while enhancing customer service levels. The perfect storm described above is not only blowing across the nation but also in San Antonio. San Antonio experienced some of the strongest economic growth in the nation with increasing needs for water and wastewater services.

[3] "Trends in Local Government Expenditures on Public Water and Wastewater Services and Infrastructure: Past, Present and Future", February, 2010.

## 2.3 Realizing Efficiencies

Given this pressure of mandated investments and near flat-line consumption growth, cutting costs is no longer an option, but in fact a requirement.

From PA's perspectives, there are *three Ps* to utilize when evaluating efficiency opportunities.

### 2.3.1 Policy Changes

Over time, utilities build legacy policies that impact overall productivity. Typical examples would include procurement policies, approval requirements, approval amount and authorization, mandatory meetings, required documentation, etc. Challenging some of the institutional policies often results in efficiency gains as there could be significant work steps cut from business processes, thus reducing labor requirements while simultaneously improving the time available to perform that major process.

### 2.3.2 Position Evaluation

It can be difficult to reduce costs when the workload grows, but it is still possible to work more effectively. The bureaucratic nature of utilities combined with siloed organization structures contribute to inefficiencies. In addition, over time, at most utilities, organizations have a natural tendency to become stale and complacent because of the style of individuals with a lengthy tenure operating in specific job functions. A reshuffle of people and positions often leads to increased inventiveness and collaboration, which positively impacts efficiency.

### 2.3.3 Process Improvements

Many work processes have excessive administrative requirements and set-up tasks that limit actual job productivity. Business process changes combined with effectively utilizing technology deliver lasting value. Identifying shadow functions, where different organizations had staff that replicated work done at the corporate office or another location leads to direct savings. Second, standardizing common processes across the enterprise and eliminating custom, one-off initiatives adds value. Third, utilizing technology to automate certain work processes leads to cycle time improvement.

## 2.4 About the Team

**PA Consulting Group, Inc.**

PA Consulting Group, Inc. (PA), a leading international management and technology consulting firm was selected to conduct this review. With more than 2,500 employees, established over 70 years ago, and operating from 24 offices around the world, PA has a dedicated energy and water practice and consequently has deep water and wastewater sector experience. In addition, PA has leading utility industry proprietary benchmarking programs for Customer Service and Shared Services. These programs provide us unique insights into the costs and performance of many standard utility processes.

PA specializes in both independent assessments as well as business transformation. Around the world, PA has helped various water and wastewater utilities evaluate their financial performance and regulatory (rate-case) strategy, develop their Capital Improvement Plan, benchmark their shared services management, and perform business unit and management audits. For this project, PA formed a team that included experts from two other firms, EBA Engineering Inc., and Intel Business Solutions, LLC with specific skill sets required to analyze various issues anticipated to be encountered in the assignment.

**EBA Engineering, Inc.**

EBA Engineering, Inc. (EBA) is a water and wastewater system design, engineering and construction management firm. EBA is a full-service employee-owned multi-discipline consulting engineering firm.

EBA has been providing professional Civil and Environmental Engineering services since 1982 and has over 185 employees with more than 50 trained and professional staff working in the Water Systems Engineering Department. EBA specializes in water/wastewater systems; civil, structural, geotechnical, transportation, and environmental engineering; construction management and inspection; materials testing and research; and surveying and mapping services.

### Intel Business Solutions, LLC

Intel Business Solutions, LLC (IBS) is a customer-focused multi-disciplinary global consulting and certified public accounting firm. IBS is headquartered in Washington D.C. and works with leading organizations across public and private sectors with a special focus on utilities and infrastructure sectors. IBS provides a broad variety of services in the accounting, financial, and management consulting areas. IBS was founded by Mr. Olu Adebo in 2012, after a long and successful career as Chief Financial Officer at DC Water. IBS is a certified small minority owned business with a deep tradition and history of providing practical solutions that deliver measurable and sustainable results.

Since inception, IBS has worked with several international and U.S. municipalities and water and wastewater utilities on: strategic planning; developing and implementing comprehensive short- and long-term financial plans; program management and support; feasibility and rate/tariff studies; budget and accounting support; and efficiency studies, organizational assessments, and corporate audits.

## 2.5 Methodology

### 2.5.1 Scope

In conducting this study, PA focused on the following areas that collectively impact the overall costs and performance of a water and wastewater utility.

- Water Management (Water Resources and Conservation)
- Customer Service
- Engineering & Construction
- Operations (Production and Treatment, Distribution and Collection, Operations)
- Shared Services
  - Communications, advertising, and Governmental Affairs (collectively under Public Affairs),
  - Facilities,
  - Finance,
  - Fleet,
  - Health & Safety,
  - Human Resources,
  - Information Technology,
  - Legal,
  - Security, and
  - Supply Chain Management.

### 2.5.2 Assessment Basis

In analyzing the above areas, PA considered both efficiency and effectiveness levels through a combination of one or more of the following:

- *SAWS Staff Interviews:* PA conducted approximately 150 interviews with SAWS executives and line personnel in order to understand the utility's management, operating practices, and business philosophy. In these interviews, SAWS personnel discussed in detail how the group operates, its general responsibilities, and how it fits into the larger SAWS organization. In some areas, it was necessary to conduct follow-up interviews to gain deeper knowledge.
- *SAWS Document and Data Review:* PA requested approximately 100 different documents and pieces of data across the organization in order to develop a comprehensive understanding of the utility's historical and current performance and cost levels.
- *Site Visits:* PA conducted site visits to facilities such as customer service centers, the Dos Rios treatment plant, pump stations, and the Aquifer Storage and Recovery facility to understand SAWS' specific operations.
- *Benchmarking:* PA has a wealth of knowledge on best customer service and other operational practices collected through its Polaris Customer Service program, in existence for over two decades. PA's Corporate Shared Services benchmarking study, in existence for the last five years, provides guidance on shared service cost levels. Our benchmark databases have data from a wide variety of utilities across the country, normalized to ensure the validity of comparisons. More discussion about the specific benchmarking programs is provided in the Customer Service and the Shared Services chapters. PA also utilized data obtained through the American Water Works Association (AWWA) benchmarking report.
- *Best Practices:* PA maintains a set of best practices for many aspects of typical utility operations that include qualitative operations techniques and key performance indicators (KPIs). By analyzing certain aspects of SAWS' policies and procedures, PA determined which areas might need a more thorough evaluation of efficiency opportunities.
- *City of San Antonio Interviews:* PA interviewed four City Council members and the Chief Financial Officer (CFO) from the City of San Antonio to understand their concerns and desired areas of focus in the efficiency study. PA also discussed the approach and methodology as well as the overall scope of its effort during these meetings.
- *Utility Interviews:* PA interviewed approximately 20 personnel from various water and wastewater utilities in the US for this particular assignment. The interviews were used to obtain qualitative information and develop an understanding of operating practices where specific comparable benchmark data was unavailable. These areas typically included Water Management, Engineering and Construction, and Operations. These utilities include Los Angeles Department of Water and Power, Denver Water, City of Philadelphia Water and Wastewater, DC Water, Louisville Water Company, Detroit Water and Sewerage Department, and City of Baltimore.
- *Consulting Team's Professional Experience:* Twelve personnel from PA, EBA, and IBS were involved in conducting this study. The combination of these three firms offered experience from decades of industry expertise and provided the technical and management knowledge required for this study. This experience allowed the team to quickly analyze and identify areas in which improvements are recommended. The Partner-In-Charge of this assignment had over twenty years of professional and sector experience and was closely involved in the analysis and report production.

### 2.5.3 Evaluative Criteria

In analyzing SAWS efficiency and effectiveness, PA used the following as evaluative criteria to determine both cost and overall performance in each area:

- Policy and Strategy (Policy) – Evaluation of corporate policies and utility's business strategy that impact the area's objectives, cost and service delivery.

- Organizational Structure and Staffing (Positions)—Evaluation of the organization to identify areas for improved management practices, governance, and efficiencies.
- Performance Metrics (Process) – Evaluation of work activities and associated cost and service level metrics to understand historical and current performance levels.
- Technology (Process) – Evaluation of the use of technology to meet the area's objectives effectively and efficiently.

### 2.5.4 Observations and Findings

Observations and findings were noted after reviewing data, participating in internal and external interviews, site visits, etc. In these observations, PA noted both the strengths and the potential areas for improvement for that particular department. These observations served as the basis for recommendations.

### 2.5.5 Recommendations and Benefits Quantification

Recommendations were made in each of the evaluative criteria areas based on the knowledge and information gained through the assessment and the analysis performed employing the evaluative criteria. In certain cases, it was easier to apply benchmarking results to quantify projected benefits, such as in Customer Service. However, in other more subjective areas, recommendations were based on the consulting team's professional opinion. Given the study period of 90-days, PA did not conduct detailed work load assessments in any area to evaluate the utilization of specific resources. In some cases, the groups or department interviewed did not utilize key performance indicators, and therefore efficiency was harder to analyze. In such instances, suggested KPIs to be implemented for the future were included in those areas of analyses.

## 2.6 Approach

PA employed a methodical, fact-based approach for conducting this review that was comprised of four main phases which are described below:


### 2.6.1 Step 1: Project Initiation and Planning

At the start of the engagement, PA held a kick-off meeting at which SAWS presented a comprehensive overview of its organization, results, opportunities, and challenges. PA and SAWS also discussed the approach, deliverables, and schedules and addressed logistical matters such as the process for the exchange of data and scheduling of meetings. We also reviewed initial data and document requests. During this phase, SAWS' objectives and goals for the project were reviewed to ensure that our approach and ultimate recommendations would align with SAWS' expectations. An outline for the final report was discussed and confirmed.

### 2.6.2 Step 2: Technical Review Analysis

This step included the majority of the data gathering, research, modeling, benchmarking, and other analysis. First, current state practices and performance were identified and compared to industry leading practices to identify gaps, or opportunities to improve performance. SAWS' processes were assessed in comparison to best practices with an emphasis on identifying issues that might be unique to SAWS. PA

began developing and substantiating initial findings, conclusions, and recommendations through the review of company data and documents, and discussions with SAWS personnel, certain City Council members, and city officers. Finally, solutions to closing identified gaps were developed, quantified, and prioritized.

### 2.6.3 Step 3: Fact Verification

Initial findings, supporting data, and conclusions were presented to the appropriate SAWS staff for validation of the underlying data and initial feedback. This process assured that a thorough and comprehensive assessment was undertaken, and the issues were properly evaluated and documented.

### 2.6.4 Step 4: Draft and Final Report Preparation

PA prepared, vetted and submitted its report based upon the findings and conclusions developed during the Technical Review and Analysis step and validated during the Fact Verification step. Recommendations were finalized with SAWS through an initial draft report presentation. Recommendations, where possible, were quantified from the standpoint of the potential savings and any needed incremental investments. Recommendations were analyzed based on the original objectives and goals established at the onset of the project.

## 2.7 Report Structure

In this report, five main chapters are covered:

- Water Management,
- Customer Service,
- Engineering and Construction,
- Operations, and
- Shared Services.

Each of these chapters presents the observations, findings, and recommendations for each area within SAWS.

# WATER MANAGEMENT

# CONTENTS

# 3 WATER MANAGEMENT

## Overview

Water Management includes managing current, and planning for future water supplies and conservation. The 2012 Water Management Plan (2012 WMP) addresses several local and regional water planning issues, including the integration of Bexar Metropolitan Water District (BMWD or BexarMet) (also known as District Special Project (DSP) integration). Using a combination of conservation tactics as well as water resource strategies, Water Management ensures that the community of San Antonio has sustainable water resources for future generations. Responsibilities of the Water Resources Department include analysis of each water supply alternative available for meeting future needs and demonstrating SAWS' commitment to obtain additional water supplies. Conservation plays a critical role in water-resource planning and management. Increasing efficient water use and reducing water waste has a direct impact on the amount of resources that will be needed in the future. The more successful a community's conservation, the lower the community's projected demand for water (relative to levels that would have occurred in the absence of conservation) becomes. Therefore, responsibilities of the Conservation Department include analyzing drought management measures, indoor and outdoor programs and rebates, and commercial conservation incentives that collectively contribute to prudently utilizing the available water supply.

PA's review of Water Management was completed mostly through qualitative benchmarking regarding supply planning methods and conservation programs through interviews with other water and wastewater utilities.

## Overall Observations

PA's evaluation focused on the ability of the Water Resources and Conservation Departments to effectively manage current and long-term water supply requirements. We analyzed Water Management evaluation of water supply sources and analysis of conservation programs and strategies. It was found that these methods were consistent with industry practices.

With a total permanent staffing of 44 full time equivalents (FTEs), we find that SAWS' Water Management, comprised of the Water Resources and the Conservation Departments, is properly structured and effectively staffed. The SAWS Water Resources Department is working aggressively to seek viable sources of new water supply to ensure long-term security of supply and manages diverse water supply sources. SAWS has one of the most dynamic and comprehensive water conservation programs in the nation. It is well recognized nationally for its data driven approach to various programs and strategies. While the general strategies employed will continue to yield results, SAWS should continue to pursue refinement and innovation.

## Areas of Excellence

- *Successful water resource planning:* The Water Resources Department has worked to develop and manage a flexible portfolio of diverse water resource options. This approach is commonly used in the field of resource planning and is essential in responding to future conditions that may result from drought or other conditions that may limit the availability of resources. The portfolio approach enables SAWS to assess its overall resource options and make appropriate supply decisions when necessary. In a challenging operating and regulatory environment, SAWS has been able to increase overall water supply by 39% over the past decade. This is a noteworthy accomplishment.
- *Providing uninterrupted water supply to BexarMet customers:* BexarMet did not have sufficient water supplies to keep up with its customers' demands[4]. In April 2011, SAWS awarded contracts to three consulting firms to develop Water Infrastructure Plans for integrating SAWS and BexarMet water systems. The three studies conducted on behalf of SAWS focused on hydraulic analysis, water supply, and water quality. In addition, a five year Capital Improvement Plan (CIP) was developed from each of the studies. As a result of these efforts, the former customers of BMWD have been provided uninterrupted access to water which would have been challenging especially in the ongoing drought conditions in the absence of a merger of the utilities.
- *Nationally recognized conservation programs:* Conservation strategies used by SAWS resonate with the top conservation programs employed nationally. SAWS conservation staff is also called upon routinely to offer input into Best Management Practices (BMPs) in this field and staff also contributes to national reports and textbooks[5]. SAWS was awarded the 2012 Water Star Award for excellence in water conservation in recognition of its long-term program efforts and leadership in the water conservation field.

## Areas of Potential Improvement

- *Improved management efficiencies:* There is an opportunity to reduce management overhead without compromising management oversight and leadership by permanently eliminating a vacancy and utilizing current management more effectively.
- *Focus on core water management activities:* Since the Water Resources Department focuses on water supply for the region through optimal supply planning, water quality testing activities currently being

[4] Evaluation of BWMD, Response to Senate Bill 341, Texas Commission on Environmental Quality

[5] Water Conservation Text Book by Amy Vickers

performed within this Department should be considered for consolidation with the Operations area that also performs water quality testing. This is discussed further in the Operations chapter.

- *Drought management rate strategies:* Price can be an effective instrument for reducing discretionary water demand especially during periods of drought. Research has consistently shown that water users respond to changes in the price of water – in general, as the price of water increases, water use decreases. A rate mechanism that uses a drought pricing surcharge could be an effective signaling mechanism for improving drought reduction compliance in addition to relying upon block rate pricing.

## Recommendations and Expected Financial Benefits

PA recommends permanently eliminating a current managerial vacancy in the Water Resources Department, previously identified by SAWS. As a result of this permanent elimination, PA was able to quantify an expected $138,000[6] in annual efficiency gains and cost savings, which is listed in Table 8 below.

**Table 8: Recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Permanently eliminate a current vacant managerial position. | Positions | $138,000 due to a strategic decision to not increase management size in this area. |
| | **Total savings** | | **$138,000*** |

- * NPV is calculated to be approximately $0.64 million under the following assumptions
  - Steady state timeframe of January 1, 2015
  - Benefits accrued between January 1, 2015 and December 31, 2019
  - Discount rate of 5%.
  - Inflation rate of 2.5%.

[6] Calculation basis provided to SAWS separately

# Introduction

SAWS has a long history of planning for future water needs. In 1996, San Antonio City Council appointed the Citizens Committee on Water Policy, a thirty-four member citizens' group, to develop a water policy for the City in response to the impending pumping limits on the Edwards Aquifer. The report determined that San Antonio had a water problem and should begin developing additional supplies. As a result of the report, the SAWS Citizens Advisory Panel (CAP) was established in 1998 to provide a public voice in determining what new supplies SAWS should pursue to secure San Antonio's water future. This committee helps SAWS assess projects, plans, and policies that help obtain new sources of sustainable, affordable water for the San Antonio/Bexar County community. The first long-range water resource plan was approved in 1998 with the input of various stakeholders from the community.

Targets for the Water Resources and Conservation Departments are set in the *2012 Water Management Plan.* This plan clearly defines goals to meet future supply and demand needs. The most recent water management plan was developed in 2012 and addressed significant developments which have arisen since the prior 2009 plan. These included:

- Integration of the Bexar Metropolitan Water District (BMWD) (also known as District Special Project (DSP) integration);
- Changes in population and demand;
- Increased amount of Edwards Aquifer water stored at the Aquifer Storage and Recovery (ASR) facility;
- Commitments associated with the Edwards Aquifer Habitat Conservation Plan (EAHCP);
- New water supply proposals; and
- Current regulatory and technical requirements (termination of LCRA-SAWS Project, changes to Regional Carrizo and Brackish Desalination Projects).
- It is evident that additional sources of supply are required to accommodate the demands of an increasing population. The analysis also highlights that water conservation and drought restrictions are both important strategies but will not be sufficient to meet future demands, as there is a supply gap. Consequently, SAWS is evaluating new water supply options in addition to continuing to aggressively pursue conservation strategies.
- PA's review and analysis of Water Resources and Conservation included interviews with other utilities such as Denver Water, Southern Nevada Water Authority (SNWA), and Los Angeles Department of Water and Power (LADWP), as well as a consultation with A&N Technical Services, Inc., a recognized water conservation expert firm based in California. In these interviews, we compared the similarities and differences of the strategies and policies adopted by SAWS with other utilities.

# 3.1 Water Management Overview

Water Management is comprised of two departments, one focused on water resources management and another on conservation. The Water Resources Department seeks to influence existing and future water needs through managing the supply of water, while the Conservation Department strives to influence the demand-side of the water supply through efforts to lower the community's projected water requirements.

## 3.1.1 Water Resources Department

Strategy Overview: The Water Resources Department oversees the management of multiple water supplies totaling over 350,000 acre-feet of water[7] (not including balance of supply stored in ASR) and the development of new water supplies as identified in the *2012 Water Management Plan* (2012 WMP). The

[7] SAWS provided information

*2012 Water Management Plan* outlines a diversified foundation for the City's water supply, emphasizing alternative water sources, recycled water, and the use of the Aquifer Storage & Recovery (ASR) facility.

The Aquifer Storage & Recovery project is the third largest ASR system in the country, with almost 100,000 acre-feet in storage recorded prior to the region's present drought, with the capability to pump water to and from the Carrizo Aquifer.[8] Construction of a brackish groundwater desalination plant is also underway which will add an additional 33 acre-feet of water a day to current water supplies in the first phase.[9] When all phases are complete, the desalination plant will be capable of adding over 90 acre-feet of water a day to current water supplies.

As of December 2012, SAWS' water supply included the following[10]:

- Edwards Aquifer, 260,310 acre-feet, which represents 58% of the System's total supply,
- Aquifer Storage and Recovery underground storage, 94,939 acre-feet, which represents 21% of total supply,
- Recycled Water to CPS Energy, 50,000 acre-feet, which represents 11% of total supply,
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- Trinity Aquifer, 3,500 acre-feet, which represents slightly less than 1% of total supply.

SAWS also serves its customers with water supplies associated with the DSP which are not included in the sources outlined above.

Observations: The Water Resources Department manages SAWS current water resource supply portfolio in relation to regulatory constraints, environmental impacts, hydrologic conditions, budgeting, contractual obligations, and development of future water supply projects. Since 2004, SAWS has increased its supply by 39%, which is a noteworthy accomplishment.

The *2012 Water Management Plan* resulted from extensive discussion and analysis by SAWS staff and was approved by the SAWS Board. It was an open process that included discussions with several key external and internal stakeholders. As a result, the underlying assumptions and scenario analysis developed by SAWS in both the Water Resources (scenario planning) and Conservation areas (Gallons per Capita per Day (GPCD) projections), are considered to be robust and were reviewed and relied upon for the purpose of this study.

### 3.1.2 Conservation Department

Strategy Overview: The Conservation Department has used a variety of programs meant to shape long-term consumption patterns of all water customers. The exact mix of conservation programs used by SAWS has evolved over time in response to customer and evaluation data; however, the four strategies revolve around:

- Rate structures that are conservation-oriented and encourage efficiency, while ensuring the affordability of water for essential uses.
- Financial incentives, such as rebates, which provide flexible tools that invite the community to participate in the conservation effort.

[8] SAWS provided information

[9] SAWS provided information

[10] SAWS provided information

- Education and outreach, which include public-education programs designed to involve the community and help residents understand that responsible water use is a critical part of living in the San Antonio area.
- Regulations, distinct from drought regulations, such as city and county government adopted land-use codes and water-use ordinances to promote the efficient use of SAWS' water resources.

The complex and inter-related nature of these conservation programs makes it difficult to attribute specific gallons per capita per day (GPCD) reductions to any one single strategy. A table of the historical GPCD reduction is included later in this chapter.

Shift to Peak Management: The *2012 Water Management Plan* included analysis in water consumption and supplying water during times of drought. Since 2006 an upward trend in consumption began during hot, dry periods. This increase in consumption corresponded with new home construction from the housing boom. Despite having efficient fixtures and smaller lots, water use increased from the irrigation systems in newer homes and in newer commercial properties. Automatic irrigation systems use tremendous quantities of discretionary water very quickly and with little effort. Although drought restrictions moderate this effect by limiting the use of spray irrigation, the per capita spikes still occur during summers with high temperatures and little rain.

This analysis led to a fundamental shift in strategy to programs that reduced dependence on spray irrigation and on the most frequently irrigated grass areas. The planning team determined that SAWS should place a higher value on programs that offset the trend of high use during hot, dry summers. Reductions in base use were too easily negated by excessive irrigation during peak usage periods.

SAWS' strategic shift will retire legacy indoor programs and shift resources to programs to reduce peak water (outdoor) usage. Traditional conservation program implementation and drought management are the two primary strategies implemented by SAWS to reduce usage:

- Drought management will continue in response to climatic conditions and regulatory requirements when immediate reduction in water use is necessary. Mandatory rules focus on discretionary water use and are staged to reflect the severity of climatic and regulatory conditions. Drought management strategies, in general, are used by utilities to ensure that total demand does not exceed available permitted supplies.
- SAWS' plan calls for a GPCD reduction from 143 to 135 gallons during dry years. Programs to improve the efficiency of outdoor watering for lawns and landscapes are expected to provide a savings of at least 1,664 acre-feet in 2012 of peak water savings to more than 1,827 acre-feet per year of peak water reductions by 2016. These targets have been calculated to account for population growth.

The 1,664 acre feet represents "peak water" saved in 2012 and does not represent the actual annual savings, which is significantly more than this amount. The annual savings targets are meant to be permanent reductions in water use, accumulating each year towards long-term supply targets. The savings target of 1,664 acre feet in 2012 does not contribute to the savings target of 1,691 in 2013, but will instead contribute to the long-term target.

Observations: Conservation is a key aspect of the *2012 Water Management Plan.* As mentioned above, SAWS' approach is to implement traditional conservation and drought management programs. This two-pronged strategy chosen by SAWS is similar to the approach of other water and wastewater utilities across the industry to lower projected demands and extend the availability of current and future water resources. While conservation is an important water management tool, the more averse and unresponsive a community is to calls for conservation, the more difficult it becomes to realize permanent conservation gains, let alone build on them. The success of this strategy will depend on mobilizing the community to continuously reduce water usage year-on-year.

## 3.2 Evaluative Criteria Employed

In evaluating the effectiveness and efficiency of water management, PA used the following evaluative criteria:

- Organization: Evaluation of the general organization, the sub-functions included, and span of control;
- Performance Metrics: Comparison of costs to industry peers and performance on internal metrics;
- Technology: Utilization of technology as an enabler; and
- Policy and Strategy: Evaluation of whether strategies and policies support the *2012 Water Management Plan.*

## 3.3 Organization

Water Management is comprised of two departments, one focused on water resources management and another on conservation.

- Approximately $54.5 million of the 2013 O&M budget in Water Resources is appropriated towards the maintenance of current water supplies (water contractors and Aquifer Management Fees).[11] Salaries and benefits for Water Resources account for approximately $1.7 million for a total budget of roughly $56.2 million annually.[12]
- The Conservation Department's total annual budget is approximately $5.1 million.[13] Salaries and benefits account for approximately $1.5 million of this total.[14] In a drought year, the cost of drought education and enforcement may use up to $300,000 of the budget.[15] Other funds are directed to long-term conservation programs.

### Water Resources Department Description and Evaluation:

- There are 17 FTEs in this area, including one Director and one administrative assistant, of which eight FTEs are involved in water supply management and seven are involved with the Edwards Aquifer Activities group.[16] This sub-function follows a "generalist model" and consequently the vast majority of roles in each of the areas are multi-skilled, multi-task, and cover multiple responsibilities.
- In the water supply management area, there are three Professional Engineers that oversee parts of the design and construction of the Regional Carrizo project. One of these engineers serves as the manager and engages in various contract negotiations related to the Carrizo project. One FTE is responsible for SAWS-wide water supply analysis and demographics. Three FTEs are engaged in long range water supply analysis and planning that include management of all surface water supplies, regional water supply project (Request for Competitive Sealed Proposal (RFCSP) development and selection, and development of the expanded Local Carrizo project. In addition, regional planning efforts such as Region L, CRWA monitoring, maintenance of leases needed for the Regional Carrizo project and monitoring of regional water policy at various river authorities and water districts is included in this area. Finally, there is 1 FTE responsible for water quality analysis.

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[11] PA has not performed an analysis of water options cost and associated regulatory fees within the $54.5 Million budget during this study and so cannot comment on these costs.

[12] SAWS provided information

[13] SAWS provided information

[14] SAWS provided information

[15] SAWS provided information

[16] SAWS provided information

- In the Edwards section, there is one geologist engaged in various feasibility analyses as well as in Edwards Aquifer Habitat Conservation Plan (EAHCP) related work; two FTEs that work to acquire additional water rights via lease and/or purchases; two staff that oversee the saline water zone monitoring program to monitor water quality (one of whom is also a geologist), and two staff that work on many EAHCP and Edwards Aquifer Authority (EAA) related issues. Implementation of the HCP is the primary function of these staff as well as monitoring and recommending policy positions on EAA-related issues.
- There is currently a vacant managerial position in the Water Resources Department.

### Conservation Department Description and Evaluation:

- There are 23 FTEs, 17 temporary part-time police officers (that work a couple hours every week), and 5 permanent part-time police officers in the Conservation Department.[17] The temporary officers have been added enforce temporary drought to achieve savings targets for demand management measures outlined in the *2012 Water Management Plan*. When drought conditions end, these positions will be eliminated.
- The Conservation Department is comprised of two divisions (outdoor and indoor programs), administrative support, and as-needed drought support. SAWS funds additional staff for Drought Management by decreasing expenses incurred in other programs and by tracking costs through a special drought code. This practice highlights that SAWS recognizes that intermittent and unpredictable labor requirements require flexible funding methods. Use of temporary staffing options manages this need without permanent staffing additions.
- With a focus on outdoor programs, PA found through its interviews that the department is engaging staff formerly assigned solely to indoor programs to apply their skills to outdoor peak programs. This gradual reassignment has already diminished the headcount in the indoor area and is expected to further decrease as the transition continues.
- A high level comparison of SAWS' overall staffing and organization structure in the Conservation area was conducted with a utility staffed by approximately 20 FTEs and a successful conservation program (targeting peak water savings significantly lower than the SAWS goals).[18] Our assessment found that SAWS' organization and structure are similar to this utility, with some nominal differences in structure and staffing. The other utility had organized this function into four broad areas, which are described below:
  - 6 Field Technicians, including a working supervisor responsible for audits and customer contact.
  - 6 Program Design personnel responsible for evaluating indoor and outdoor programs.
  - 3 Data Specialists who were responsible for GIS updates, reporting, and performing proactive analysis of target areas
  - 5 Administrative Staff, including a Director responsible for general administration and paperwork.

## 3.4 Performance Metrics

### Water Resources Targets

The *2012 Water Management Plan* sets annual and long-term targets for the Water Resources and Conservation Departments. Demand goals and supply project targets are clearly defined, and it is evident that additional sources of supply are required to accommodate the demands of an increasing population. The analysis also highlights that water conservation and drought restrictions are both important strategies

[17] SAWS provided information

[18] Interview conducted by PA

but will not be sufficient to meet future demands, as there is a supply gap. Consequently, SAWS is evaluating new water supply options in addition to continuing to aggressively pursue conservation strategies.

SAWS made the following planning assumptions:

- Per Capita Water Use – 143 GPCD in 2011 (based on the hottest, driest year recorded in Texas).
- Population Projection for Entire Service Area – 1.2% annual growth or ~20,000 people per year.
- Water supplies are planned for as impacted by drought of record conditions; firm yield of supply.
- 2012 Demand of 79 Billion Gallons (in acre-feet) - as impacted by drought and demand reductions.
- Conservation program track record - investment and associated benefits by various types of programs.
- Drought Planning – assumptions/cases being considered.

In the area of water supply and planning, PA analyzed the sources and volume anticipated to meet the water supply gap.

**Table 9: Future planned supply volume by source**

| Planned Supply Source | Expected Volume of Water |
|---|---|
| Additional Edwards Rights | 10,900 ac-ft/yr additional |
| Brackish Groundwater Desalination Plant | 12,210 ac-ft/yr on-line in 2016<br>24,420 ac-ft/yr in 2021<br>30,525 ac-ft/yr in 2026 |
| Expanded Local Carrizo | 7,000 ac-ft/yr on-line in 2017<br>14,000 ac-ft/yr in 2022<br>21,000 ac-ft/yr in 2026 |
| Regional Water Supply Project (RFCSP) | Up to 50,000 ac-ft/yr starting in 2018 |
| Demand Reduction - Water savings from programs to reduce dry year GPCD from 143 to 135 | 16,500 ac-ft/yr by 2020 |

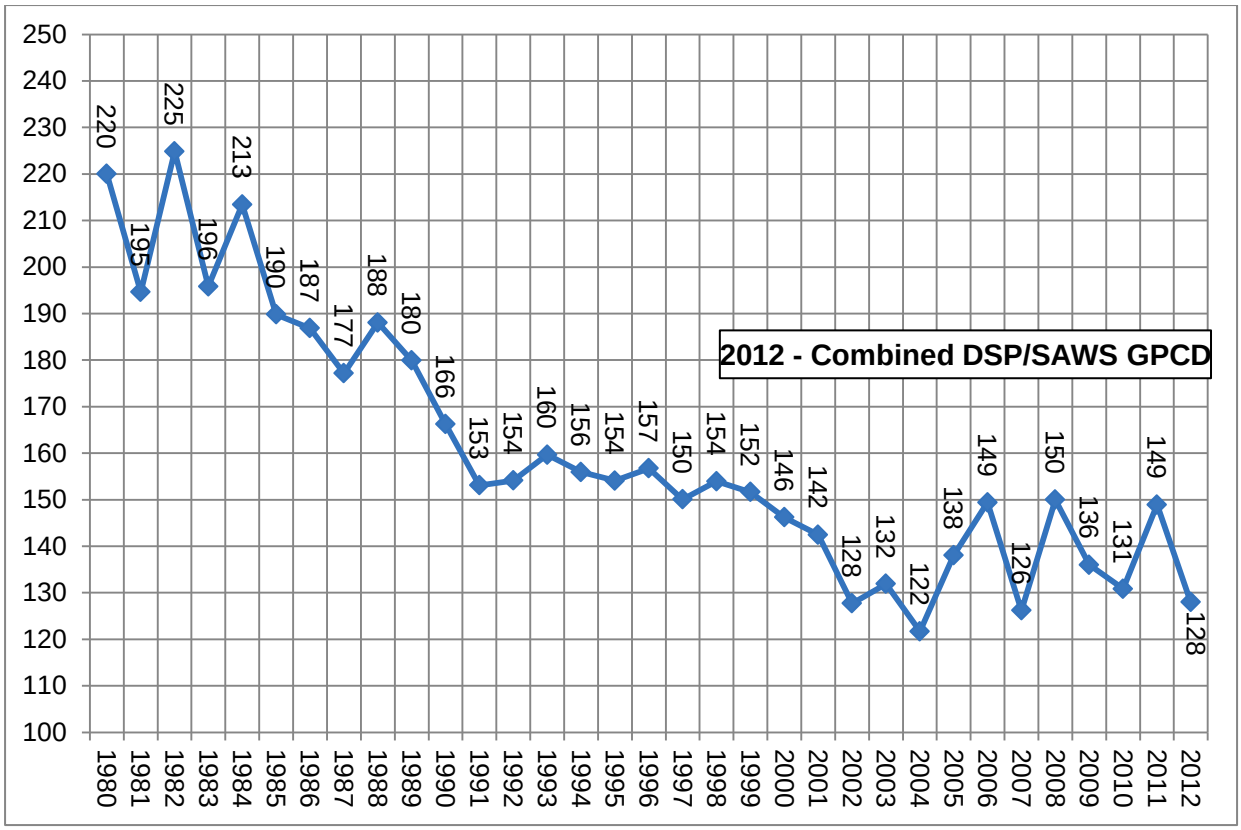
*Source: Data provided by SAWS*

### Conservation

PA's effectiveness evaluation of this area centered on analyzing three key metrics – GPCD, Drought Demand Management, and Non-Revenue Water (NRW) loss.

GPCD: The chart below shows that SAWS has reduced its per capita consumption from approximately 220 GPCD in 1980 to 128 GPCD in 2012.

**Figure 4: Historical total water usage in terms of gallons per capita per day (GPDC)**




*Source: Data provided by SAWS*

The units used in Figure 4 represent total GPCD and not household GPCD. Total GPCD includes all water sent into the water distribution system divided by the population of the SAWS service area. This metric, therefore, includes industrial water use, discretionary landscape water use, water losses, and residential water use. It is not recommended that water utilities be compared against each other for total GPCD because differences in industrial and commercial usage influence total GPCD.

PA interviewed SAWS personnel to understand the basis of its GPCD calculations and projections in the 2012 WMP. PA understands that after 2010, SAWS revised its historical GPCD data to utilize improved population data from the recent census. Some of the GPCD data that had been reported prior to the census was lower due to less accurate population information and implementation of more accurate raw water production measurement instrumentation. If the same water consumption is applied over a larger or smaller population, the GPCD correspondingly changes significantly. SAWS planning staff recognize the importance of analyzing the size of their service population each year. Because SAWS does not serve exact county or city boundary areas, estimations to adjust population are required each year. The Texas Water Development Board (TWDB) provides guidance to utilities to handle this challenge. The suggested remedy is to apply a ratio from census data to metered customers so that population increases are incorporated as new customers are added each year, and to periodically evaluate the appropriateness of the ratio being used in the interval between the decennial censuses based on a benchmarking of the proportions of various residential meter types presently in use versus the proportion in use when the ratio was developed.

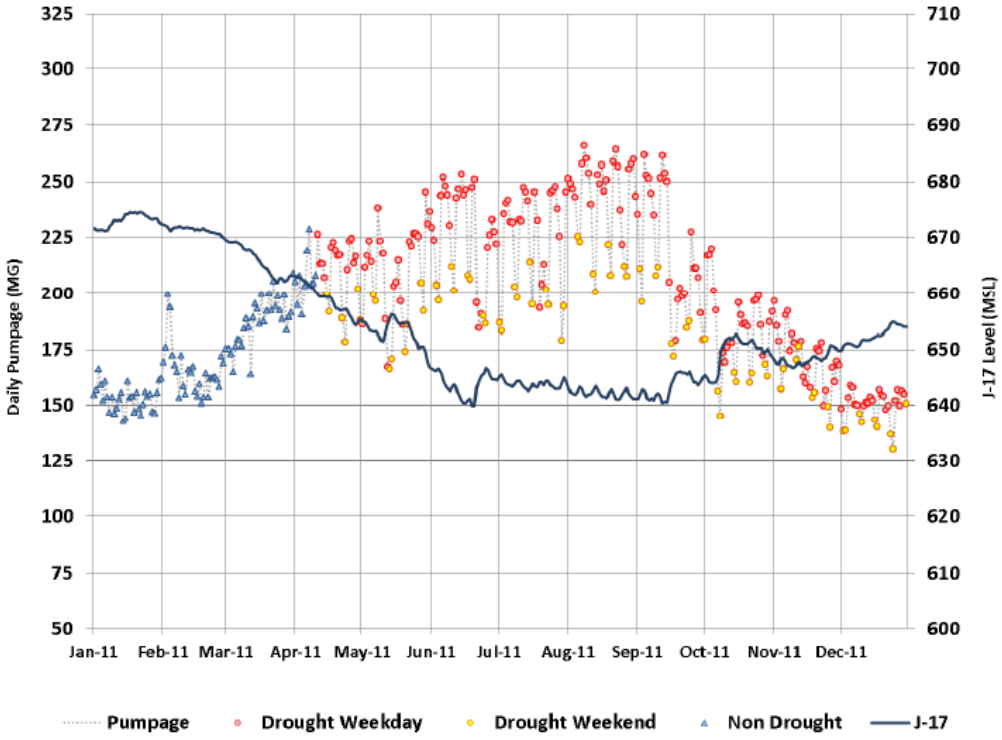
GPCD is also expected to fluctuate with weather conditions. Wet years like 2004 and 2007 result in lower water sales and decreased per capita consumption. Conversely, in years when there is little rainfall during the growing season, such as 2006, 2009, and 2011, SAWS experiences higher peak demands and

sales. The results from the GPCD chart makes clear the challenge of reducing aggregate water sales from one year to the next. SAWS' focus on peak water savings opportunities should help address this fluctuation.

Drought Demand Management: This is a strategy that reduces demand on a temporary basis. Its effectiveness can be reviewed in comparison to the cost of drought firm supplies of water that might be acquired for sale during limited time periods of drought. In 2012 SAWS spent $181,132 on drought education and enforcement. The effectiveness of drought restrictions was evaluated through three data components.

The first is the pattern of consumption on weekends. Figure 5 below reveals a pattern of reduced total pumping from SAWS on weekends when spray irrigation is prohibited. The graph shows this pattern echoed during the work week, resulting in a more subdued pumping pattern than would otherwise exist.

**Figure 5: 2011 Weekend Pumping and Impact on J-17 Index Well**



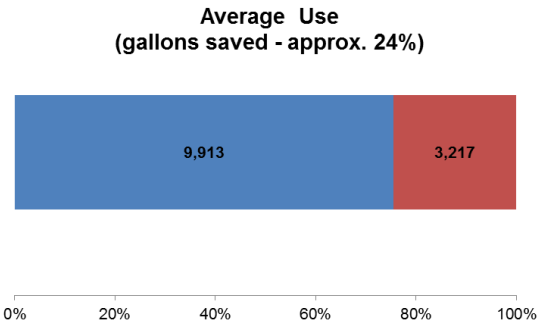

*Source: Data provided by SAWS*

Second, the reduced pumping on weekends has a significant effect on aquifer levels. The effect of reduced consumption is most apparent during the late summer months. During the summer of 2009 and 2011, Stage 2 drought restrictions prevented the aquifer from reaching trigger levels for deeper permit reductions.

A third piece of data that illustrates the effectiveness of having an enforcement program is the average amount of reduced consumption post citation. Most SAWS customers comply with drought regulations and never receive a citation. The relatively small number who do receive a citation provide an opportunity to assess how compliance reduces water use.

Figure 6 below shows that consumption of those cited for violation of drought demand management measures had an average usage reduction of 24% in 2011 post citation. [19] The analysis examined usage four months prior to the citation and the subsequent four months after the citation.

**Figure 6: Pre and post citation water usage (four months)**




*Source: Data provided by SAWS*

## 3.5 Technology

The Water Resources Department uses a variety of software to complete its work, including typical MS Office software suite products, ESRI GIS products, and Primavera web based project management software. The Department is not equipped to perform specialty modeling relating to Aquifer characterization. Specialty work of this type is performed by contracted consultants.

In the Conservation area, SAWS currently utilizes the following types of technologies:

- Meter Data Loggers: These are portable devices that can be attached to meters to provide consumption reads every 15 seconds. Meter Data loggers are selectively used for analyzing extreme customer issues, such as pinpointing excessive usage or evaluating programmatic savings, since they are expensive and difficult to deploy.
- Irrigation Delay Technology: These devices receive a signal to turn off irrigation even before the arrival of rain. This technology is deployed at large sites where usage is between 10,000-100,000 gallons for each application and a favorable cost/acre foot exists.
- Flow Sensors: These devices monitor the flow patterns of irrigation systems and then shut them down when the gallons/minute becomes too high, which is generally caused by a leak in the system. Flow sensors are currently piloted at sites with large meters and diverse usage.

## 3.6 Policy and Strategy

Water Resources: The *2012 Water Management Plan* sets the policy regarding Edwards Aquifer permit inventory, incorporating the purchase and lease of water rights on an ongoing basis, monitoring potential rule and policy changes by the EAA, and mitigating impacts on SAWS Edwards Aquifer permits. Outside of the Edwards Aquifer, studies are also being performed relating to the Carrizo Aquifer and ASR in Southern Bexar County, which the Department monitors for policy changes. Lastly, the Department also interacts with various regional Groundwater Conservation Districts and Groundwater Water Management Areas to analyze potential rule or policy impacts and comments on behalf of SAWS to protect its interests.

Conservation: The level of conservation investment of a utility reflects its water planning urgency. From the utilities that PA interviewed, Southern Nevada Water Authority (SNWA) was the most comparable

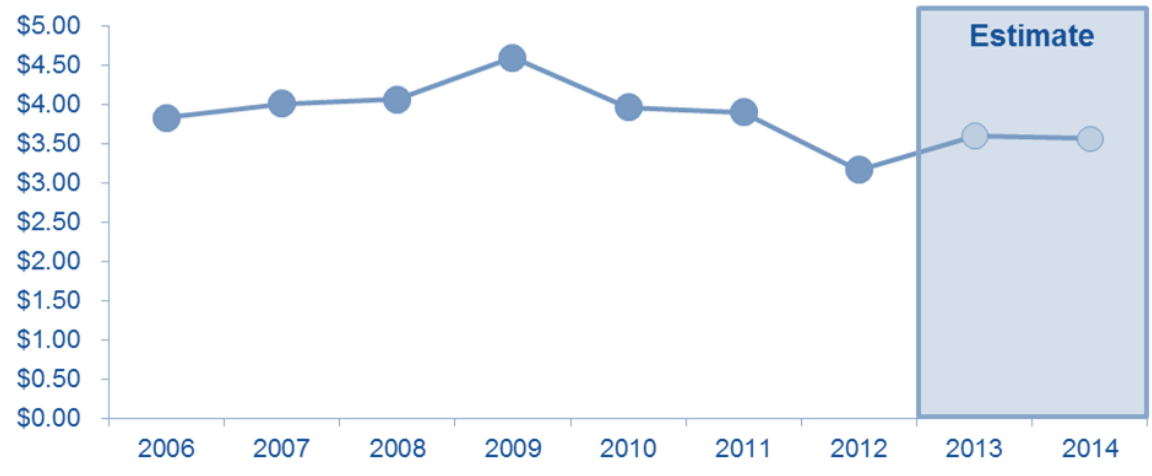
[19] SAWS provided information

utility that shared a similar level of urgency to manage water consumption. Even though the SNWA operating territory is different from SAWS and the specific programs that SNWA utilizes are customized to its territory, strategically it shares the same conservation philosophy as SAWS, even though it is not both a retail and wholesale water utility.

SNWA manages incentive programs, education, and conservation messaging for their customer cities. In the mid 2000's, when SNWA's conservation efforts were at their peak, the conservation incentive budget was over $20 per capita. Today the conservation budget is approximately $8 per capita despite the recent change in new customer growth due to the sluggish housing sector and other economic conditions in the Las Vegas area. Even with drastically revised growth projections, Las Vegas is still investing $8 per capita to achieve water use reductions as part of their water management strategies, highlighting the urgency that it places on conservation programs.

As a matter of policy, SAWS conservation investment has remained around $3.50 to $4.00 per customer as shown in Figure 7 below:

**Figure 7: Conservation spending per person**




*Note: SAWS 2013 and 2014 per-capita conservation spending projected with a population increase of 1.2% over 2012*

*Source: Data provided by SAWS*

## 3.7 Recommendations and Estimated Benefits

PA has identified approximately $138,000 in savings as a result of optimized managerial oversight. PA recognizes SAWS as a leader in the area of conservation and recommends that SAWS continue its efforts with a continued focus on peak water savings.

### 3.7.1 Permanently Eliminate a Vacant Managerial Position

A managerial position has been vacant in the Water Resources Department for some time.

#### Recommendations

PA recommends permanently eliminating the vacant position and continuing to utilize the current management more effectively for providing oversight and leadership to staff.

#### Estimated Benefits

Elimination of this position is estimated to result in approximately $138,000 in savings.

### 3.7.2 Consider Drought Pricing Signals

The current residential SAWS rate structure ensures that conservation investment originates from revenue generated by high volume residential users (supporting residential programs) rather than average residential customers. Commercial conservation investment originates from a small portion of the meter fees paid by all commercial users (supporting commercial programs). This balances the revenue instability to conservation from residential customers that is based on top tier only. Residential customers do not pay for commercial conservation programs. Commercial customers pay a small portion of their meter fee into the conservation fund and may be credited back in the form of incentive rebates and materials that benefit all customers over time but also proportionately to the specific company by helping to keep their overhead costs low.

#### Recommendations

A rate mechanism that uses a drought pricing surcharge could be an effective signaling mechanism for improving compliance with drought demand management measures, provided it is used in addition to the efforts already in place to manage demand during drought. A simple augmentation of the existing system that currently only uses a seasonal tier pricing system to one that is seasonal and drought based should be explored. Creating rate increases for the heaviest users during drought times will help to smooth demand over longer periods of time.

#### Estimated Benefits

PA has not quantified the impact of drought pricing on SAWS rate structure as this is out of scope of this project. However, given the strategic importance of this issue and in light of the pending Rate Design process, PA wanted to highlight the need to include this aspect as part of that analysis.

### 3.7.3 Continue Conservation Efforts with a Focus on Peak Water Savings

Through our interviews with other utilities and conservation experts, it was clear that SAWS is considered a leader in the conservation field, specifically recognized for its data driven approach to conservation programs. It should also be noted there is no water and wastewater utility in the nation that has completely abandoned its conservation and drought management program. If anything, utilities have continued to increase efforts in this area as water is being increasingly recognized as a precious resource across the nation.

#### Recommendations

Recognizing that conservation is a long term policy issue to ensure future access to water, PA recommends that SAWS continue investing in conservation. However, evaluation of these programs should be performed annually to ensure that the investment in conservation yields estimated benefits. Use of conservation funds should be directed at investments that provide long-term peak water savings at a favorable cost per acre-foot.

#### Estimated Benefits

Investment in conservation reduces the long-term cost of water for all customers by reducing the need to maintain access to excess inventory of peak water supplies sold only during limited time periods. While a specific Do Nothing scenario was not studied in detail, one can deduce that if conservation and drought management were completely eliminated the consumption patterns revert back to higher levels. PA has not studied the likely increase in per capita consumption or what this would cost SAWS.

## 3.8 Net Present Value (NPV) Calculation

PA calculated the NPV to be approximately $0.64 million based on the following assumptions:

- Cost of Capital: 5%[20]
- Annual O&M Benefits Anticipated: $138,000
- Steady State Target: January 1, 2015
- Timeline: 5 Years (January 1, 2015 to December 31, 2019).
- Inflation rate of 2.5%.

[20] Information from SAWS

# CUSTOMER SERVICE

# CONTENTS

# 4 CUSTOMER SERVICE

## Overview

Customer Service is responsible for delivery of front office and back office customer care services to customers. These services include meter reading, field services, billing, payment processing, contact center, credit and collections, and revenue assurance.

PA's review of Customer Service relied heavily on benchmarking data from PA's proprietary Polaris Customer Service Benchmarking Program ("Polaris") to conduct an assessment of SAWS' customer service costs and performance levels. PA has successfully run the Polaris program for over two decades, allowing SAWS to be compared with other utility companies at a national level.

## Overall Observations

With approximately 273 FTEs[21], PA found SAWS Customer Service division staffing to be high compared to utilities delivering similar services. It is PA's assessment that the level of challenges faced by SAWS in improving its customer service performance may require expertise not available in-house. An external expert view would also provide impetus needed to challenge current customer service procedures and develop it into a strong mainstream customer service operation.

## Areas of Excellence

- *Cost effective meter reading and field services activities*: Meter Reading and Field Services, sub-functions within Customer Service, display first quartile cost performance.

## Areas of Potential Improvement

- *Improvements in Customer Contact Center:* Reduction in call volume, improved call handling, and introduction of technology are key changes required in the customer contact center to reduce costs and improve service levels. Technology improvements will reduce expensive live call volumes (through the utilization of Integrated Voice Response (IVR) and an improved website). Improved call handling will reduce call duration and improve employee satisfaction as the contact center agents acquire skills to handle calls more effectively.
- *Handling exception-related billings:* The main challenge in the billing process is the handling of exceptions and post-mail adjustments. The volumes associated with these bill types drive work effort and expenditures. Changes to bill generation parameters will eliminate unnecessary work streams on both the front and back end while increasing bill accuracy.
- *Credit and collections metrics:* There are three main types of activities associated with this area - handling calls with delinquent customers, selecting accounts for disconnect, and completing actual disconnects. Properly designed, these activities can be minimized and uncollectible expenses reduced. Changes to all three will result in properly setting customer expectations and reducing efforts to collect delinquent amounts.
- *Key Performance Indicators (KPI) and Smart Analytics:* A properly designed KPI framework will help identify tactical changes required and serve as a useful tool for measuring ongoing performance as well. KPIs help focus employee attention on activities that management would like to promote and reduce unproductive time. Analytics and reporting will provide transparency and enable management to spot performance trends and respond to them. Using the data in a normalized smart fashion would help manage costs while improving performance.
- *Website and Use of Technology:* The SAWS website has limited customer utilization. Specific changes to the website would increase its usage and reduce live call volume. Such changes would be in line with industry website operations. The current website can be described as being a part-corporate, part-customer service site, rather than a full-capability customer service website.
- *Customer Service Expertise:* The current SAWS Customer Service division lacks innovative customer service insights and capabilities necessary to run an operation that is focused on meeting customer needs consistent with customer service quality and experience provided by other businesses. With new developments in the past decade with respect to customer and employee management combined with recent technology advances, it is necessary for SAWS to absorb and apply those lessons to meet customer expectations.
- *Division Leadership:* A key factor impacting the long term success of this organization will be commitment and ownership on the part of management and leaders. With the changes that PA

[21] Information from SAWS

recommends, SAWS needs an individual with a commitment to implement changes within the Customer Service Department.

## Recommendations and Expected Financial Benefits

PA recommends implementing improvements that leverage technology enabled efficiencies. Of these programs, PA was able to quantify an expected $1.507[22] million in annual efficiency gains and cost savings, which are listed in Table 10 below.

**Table 10: Recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Consolidate management positions | Positions | $324,000 from consolidation of management and administrative responsibilities |
| 2 | Improve call handling and technology in contact center | Process | $441,000 from process and call handling improvement and increased technology utilization to reduce live calls |
| 3 | Reduce volume of bills | Process | $147,000 from a reduction in the volume of exceptions and post mail processing |
| 4 | Reduce delinquency processing | Process | $196,000 from reduced number of customers to process because of a lower delinquency rate |
| 5 | Implement KPIs and improve reporting | Process | $147,000 from performance improvements, performance measurement and improved reporting |
| 6 | Close customer payment centers | Policy | $252,000 to $1.1 million from closure of one or more customer payment centers |
| | **Total savings** | | **$1,507,000*** |

* NPV is calculated to be approximately $6.9 million under the following assumptions:

- Assumes one time investment of $400,000 towards process and technology related investments for retaining external experts to assist with process changes and an upgrade to the SAWS website.
- Assumes sale value of $240,000 from one customer service facility that will be used to pay for a portion of the investment.
- “Steady state” timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Benefits accrued between January 1, 2015 and December 31, 2019.
- Discount rate of 5%.
- Inflation rate of 2.5%.

[22] Calculation basis provided to SAWS separately

## Introduction

The new digital era connects key utility stakeholders in ways they never were before – utility leaders need to be able to match customers' expectations in this new environment. Utility companies find themselves being compared to firms like Netflix, Amazon, and Google who are rewriting the standards for superb customer experience. Digital mobile technologies, social media, connectivity, big data-type analysis, and self-service are customer experience tools that utilities are expected to provide as well. Therefore, utilities face the challenge of effectively adopting these digital technologies while delivering high quality outcomes with the lowest possible use of resources.

## 4.1 Overview of Customer Service Division

The SAWS Customer Service Division is organized into four groups each with specific functions dealing with different aspects of customer service. These groups and description of their function are summarized below:

- Billing – With 34 FTEs split between operations and support, this function generates bills and addresses any billing related issues, such as exceptions and post-mail adjustments.
- Customer Care – Comprised of 82 FTEs split between Contact Center and Customer Support, this function manages interactions with customers such as live and Integrated Voice Response (IVR) calls, e-mails, and payment handling. This also includes personnel staffing for four customer payment locations.
- Field Operations – 146 FTEs cover meter reading, field services, credit and collections, meter technicians, meter testing, and revenue assurance -- the field portion of Customer Service operations associated with reading, managing, repairing, connecting, and disconnecting meters.
- Quality & Training – 10 FTEs are responsible for training, process, and quality analysis. This function provides training for Customer Service Associates and provides various reports to assure compliance with established procedures.

These 272 FTEs are overseen by the Vice President of Customer Service, for a total of 273 FTEs.

The functions are consistent with those of any other utility in North America – satisfying customer needs and operating the meter-to-cash value chain. Any differences in types of work that exist between SAWS and other utilities are relatively minor and do not account for operational efficiency disparities. Rather, disparities are driven by performance outcomes – how various tasks are completed, their costs, and achieved service levels.

## 4.2 Evaluative Criteria Employed

In evaluating the efficiency of the current state of the customer service division, we analyzed the following:

- Performance Metrics: Evaluation of key costs and service level performance metrics for seven functional areas (Contact Center, Billing, Payment, Meter Reading, Field Services, Credit & Collections, Revenue Assurance),
- Organization: Evaluation of the general organization of the division and span of control,
- Technology: Utilization of technology in this area, and
- Strategy and Policy: Evaluation of strategies and policies.

## 4.3 Performance Metrics

Overview: PA utilized its proprietary Polaris Customer Service Benchmarking Program (Polaris) to conduct an assessment of SAWS' customer service costs to gauge efficiency and performance levels. PA

has successfully run the Polaris program for over two decades and consequently the analysis benefits from a robust comparison of SAWS performance against other utility companies at a national level. The objective of our assessment is to evaluate SAWS' current costs and service level performance in comparison to other utilities.

Over the past twenty years, Polaris has been collecting customer service best practices and correlating them with company performance. The goal is to define what top performance looks like and provide benchmarking participants with guidance on how these practices can be applied. Because there is no one-size-fits-all approach to implementing best practices across companies, PA focuses on the behaviors that define a top performer, rather than diverting efforts on the mechanics of best practice implementation. This focus has led to the development of top performer profiles that can provide direction to companies under a variety of operating conditions and provide insight into streamlined, efficient operations and procedures that improve customer service. The Polaris assessment was completed across the seven areas covered in SAWS' customer service function, which are listed in Table 11.

For each area, both financial and operational metrics were developed and compared to the Polaris panel of companies. In some cases, the data was not available, so no metric was identified; in other cases, estimates were developed or extrapolated from sample data provided.

Approach: In performing this assessment, PA undertook a structured approach that involved developing a scorecard tracking 107 specific questions across the seven functional areas. The approach consisted of the following activities:

- Collect financial and operational data related to all functional areas (based on definitions, data was collected on key aspects of customer service operations and then related to physical footprint).
- Identify normalization factors (determine denominators that will be used in order to compare a company to its peers).
- Complete data validations (develop correlations and validate that data is correct).
- Analyze the data and derive conclusions (based on the relative positions of a company compared with panel companies).
- Complete high level interviews with staff (to obtain context for received numbers and to develop stronger perspective on areas that require further improvements).
- Complete high level benefits quantification (confirm opportunities for improvement with SAWS executive management).
- Develop improvement recommendations (provide a list of improvement recommendations).

All of the above was done in a careful and methodical manner to ensure equitable comparisons with peer companies.

Summary Findings: SAWS' costs and service levels across most of the functional areas are close to the median of peer companies' levels – even though some may be at different points of these ranges they are typical for a utility. However, the Customer Service Department faces challenges both in terms of expenses and service levels in functional areas such as Billing, Revenue and Collections, and Contact Center. Regarding service levels, several functional areas exhibit below average performance outcomes, with some exceptions such as meter reading.

Expenses and service levels are presented in terms of quartile rankings and summarized in Table 11 below, with first quartile (Q1) representing low cost and/or high performance and fourth quartile (Q4) representing high cost and/or low performance.

**Table 11: Quartile rankings by functional area[23]**

| Functional area | Description | Costs | Service Levels |
|---|---|---|---|
| **Contact Center** | Fielding calls/interactions from customers | Q1 / Q2 | Q3 / Q4 |
| **Billing** | Mailing, exceptions, adjustments of bills | Q3 / Q4 | Q3 / Q4 |
| **Payment** | Handling payments, including costs payment centers | Q3 / Q4 | Q3 / Q4 |
| **Meter reading** | Meter reading | Q1 / Q2 | Q1 |
| **Field Service** | Handling meter service orders or other meter reading services | Q2 | Q2 |
| **Credit & Collection** | Handling delinquent bills | Q3 / Q4 | Q3 / Q4 |
| **Revenue Assurance** | Handling meter tamper cases, lost billed revenue | Q3 / Q4 | Q3 / Q4 |
| **Self Service** | Handling of website transactions, e-billing | N/A | Q1, Q4 |

Table 12 below provides a high-level summary of each functional area including drivers, expenses, and service levels. Drivers are factors that have the most impact on performance as represented by expenses and service levels.

**Table 12: Performance drivers, expenses, and service levels by functional area[24]**

| Functional area | Drivers | Expenses | Service Levels |
|---|---|---|---|
| Contact Center | Number of live calls, wages, and staffing approach when calls are coming in -- for example, more calls will drive higher expenses | Lower than average due to low wages and mostly short call duration | Mostly worse than average - specifically calls answered in a time period and agent utilization |
| Billing | Number of exceptions, adjustments, and billing frequency – both of these were high | Worse than average – require substantial amount of manipulations and manual activities | Mostly worse than average – affected by bill generation criteria |
| Payment | Number of face-to- face transactions increases costs | Higher than average - mostly due to face-to- | Worse than average – lower percentage of |

[23] PA's Polaris Benchmarking Analysis

[24] PA's Polaris Benchmarking Analysis

| Functional area | Drivers | Expenses | Service Levels |
|---|---|---|---|
| | due to idle time between transactions | face transactions | electronic transactions |
| Meter Reading | Number of meter reads, wages, and geography | Lower than average due to low wages | Meter reading errors better than average |
| Field Service | Number of field orders, wages, and geography | Average | Not available |
| Credit & Collections | Consistency and quality of disconnect process, wages, number of disconnect orders, and geography | Higher than average, possibly due to ineffective activities | Mostly worse than average or not available |
| Revenue Assurance | Number of cases, operating efficiency | Higher than average | Worse than average |
| Self-service | Adoption of digital or self-service capabilities | Not applicable | Mixed, some worse than average across all metrics |

Cost Drivers: SAWS has a mix of positive and negative cost drivers that impact expenses. There are several aspects of Customer Service operations that drive costs:

- Wages – SAWS wages are at the low end compared to the peer panel wages; since Customer Service is 70% to 80% labor, this should have a positive impact on overall normalized expenses. However, overall expenses are relatively higher than expected based on wage differentials, suggesting opportunities for capturing operational efficiencies.
- Activity types – Expenses depend on how various tasks are completed. For example, face-to-face payment transactions are much more expensive than any other payment type. SAWS is one of the few utilities that still maintains local payment centers.
- Transaction volume – Costs are directly proportional to transaction volumes. For example, if a company's policy is to disconnect a meter when a customer moves out and reconnect it when a customer moves in, then the number of transactions, and consequently cost, increases.
- Personnel count – The number of Full Time Equivalents (FTEs) impacts the cost of operations and is dependent upon processes and embedded activities; in several functional areas within Customer Service, SAWS has an above-average number of employees per 100,000 customers.

Service Level Drivers: These are driven by several factors including:

- Decision types – Any type of operation is triggered by a decision (How many days after delinquency should a meter be disconnected? What types of exceptions should be generated to ensure accurate bills? How to structure the IVR to increase its utilization?). The quality of these decisions drives Customer Service performance outcomes. Since different types of decisions can be made in each area, performance outcomes are affected.
- Actionable Key Performance Indicators (KPIs) – Effective operations are driven by KPIs to both track progress against operational and strategic objectives. They serve a dual role, however, in that they signal to employees which parameters are more important than others.

- Reporting – Provides useful data trends that can be used to undertake corrective actions. All data recognized by the industry as useful and necessary to run the Customer Service operations should be considered. When data is missing, operations are not well-controlled.
- Management – An approach to organizing work which results in spending and quality outcomes that meet expectations and specifications.

PA has performed detailed functional area cost and performance benchmarking for each of the seven areas included in the Appendix. We have summarized key observations for each functional area below.

### 4.3.1 Contact Center

Analysis on the contact center showed mostly lower than average costs both on per-customer and per-transaction basis (in the Q1 range). Service levels were mostly below average – and some service levels were not available - with the exception of call handling durations. Call handling duration was lower than average (Q1) due to low website and IVR utilization, which we would have expected, as there is a large proportion of short duration calls. There is a brief discussion of remaining service levels, provided below, many of which have either a negative impact on the customer experience or increase costs:

- Average Time to Answer (CSA & IVR combined) – at 163 seconds (Q3) 25 it is worse than average and has a negative impact on customer experience, indicating higher costs and lower performance.
- Percent of Calls Answered by CSA After Leaving the IVR/VRU Within 30 Seconds – at 35%[26], this is well below average on an annual basis and has negative impacts on customer experience.
- CSA Utilization For Residential and Business Calls – at 79%, this is Q4[27] – the main impact is increased costs due to underutilized employees, which indicates high costs or low levels of performance.
- Percent of Total Incoming Calls Completed by Company or Outsourcer IVR/VRU – at 27%[28], this outcome (Q4) indicates low levels of performance and increased costs and has a negative impact on costs and ability of customers to self-serve at their convenience.
- Percent of Calls Abandoned after Leaving the IVR/VRU Per Offered Call – at 4.27%[29], this is a Q2 outcome and has a small impact on average customer experience (note: there are some days of the week where this impact is much larger than average – possibly 2 to 3 times larger, especially on Mondays).

Based on cost and service level outcomes, at a high level we can conclude that service levels point to improvement opportunities associated with:

- Call volume reduction through increased IVR usage,
- Stronger employee utilization to increase productive time, and
- Improved website to shift live calls to online interactions.

[25] PA's Polaris Benchmarking Analysis

[26] PA's Polaris Benchmarking Analysis

[27] PA's Polaris Benchmarking Analysis

[28] PA's Polaris Benchmarking Analysis

[29] PA's Polaris Benchmarking Analysis

### 4.3.2 Billing

Within the billing area, costs were mixed, but mostly on the high side, likely due to the high volume of exceptions (collected outside of the scorecard data) and post-mail adjustments. Service levels were either around or below the median (between Q2 through Q4). Below is a brief discussion of the service levels:

- Percent of Bills Mailed Between 0 to 24 Hours from Upload into the System – not available – this is bill issuance timeliness indicator.
- Bills Adjusted Pre- and Post- Mail As a Percent of Total Bills Issued – when benchmarked against the peer panel, SAWS ranked slightly worse than average. When a company (in this case, SAWS) issues a bill, the customer receives it, sees it's incorrect, and then has to ask for a correction, that negatively affects that customer's experience.
- Percent of Bills Adjusted Post Mailing As a Percent of Bills Issued – not available – affects customer experience.
- Percent of Bills Returned Per Bills Issued – SAWS performed lower than average (Q3) when compared to the peer panel, which affects Revenue & Collections outcomes.
- Bills Updated Per Bills Returned – the 53%[30] outcome is average and affects Revenue & Collections tracking of delinquent customers.

Based on these metrics, key challenges will be centered around:

- Reducing exceptions and adjustments to improve customer experience.
- Increasing the percentage of returned bills processed to improve Credit & Collections outcomes.
- Increasing the percentage of e-bills to reduce costs and improve customer convenience.

### 4.3.3 Payment

High costs within the payment function are driven by the comparatively large number of local payment centers. Face-to-face transactions have higher costs compared to remote or automatic transactions due to the reality that employees are sometimes idle in between serving customers. At SAWS, a small percentage of overall payments were completed at local payment centers. The small number of transactions contributed to a larger share of overall payment costs. The existence of local payment centers is usually the principle distinguishing factor when comparing costs across different companies. Although payments make up a small proportion of overall Customer Service expenses, if SAWS did not have local payment centers, their costs would likely be quite similar to the peer panel.

Another typical source of cost savings regards the spread of transactions across different service levels. For SAWS, 70% of payments were completed electronically, which is above average. SAWS should strive to keep increasing that percentage to reduce costs and improve customer options.

### 4.3.4 Meter Reading

Meter Reading costs were lower than average, both on a per-customer and per-reading basis, and service levels were stronger than average. PA offered suggestions to improve service levels through more effective management approaches. Otherwise, these are acceptable outcomes. SAWS' results of key service levels were as follows:

- Percent Actual to Scheduled Meter Reads – SAWS performs favorably in this area (Q2). This is a good outcome and the higher the percentage of actual to scheduled meter reads, the fewer estimated meter reads and bills.

[30] PA's Polaris Benchmarking Analysis

- Manual Incorrect Reads Per Manual Reads – SAWS performance in this function also compares well to the peer panel (Q2). This benchmark result is an indication of meter reading quality.
- Chronically Not Read Meters Annually Per 1,000 Customers – SAWS functioning in this area is higher than average compared to the peer panel (Q1). This finding demonstrates that few meters were left chronically unread.

### 4.3.5 Field Services

Field Services performed at average in terms of overall expenses. Unfortunately, neither more detailed expenses nor service levels were available. Further analysis would be necessary to conduct more in-depth analysis regarding field and back-office operations associated with field order processing.

### 4.3.6 Credit and Collections

Credit & Collection expenses were generally closer to the average on both a per-customer and per-field-order basis. Service levels were either unavailable or were worse than the average. A brief discussion of these service levels are as follows:

- Average Active Receivables >= 90 Days As a Percent of Delinquent Active Residential Receivables – unavailable* – this indicator provides important information about receivables aging.
- Average Inactive Receivables >= 90 days As a Percent of Delinquent Inactive Residential Receivables – unavailable* – this measurement provides important information about receivables aging
- Days Sales Outstanding (All Commodities) – at a benchmark finding of 24[31] days, this is an average outcome.
- Collection Agency Recovery Rate All Placements – with SAWS' recovery rate currently at 4.5%, this is an unfavorable outcome (Q4) that affects uncollectible amounts. The national average for the peer panel is about 16%[32], so there are opportunities for improvement.
- Broken or Modified Arrangements Per Payment Arrangements Issued – unavailable[33] – if available, this would be an indicator of the effectiveness of customer management policies.

### 4.3.7 Revenue Assurance

Revenue Assurance (RA) metrics indicated one of the highest costs per-meter compared to the peer panel. Service levels (related to effectiveness) were generally below average, indicating that the payoff from RA investment for SAWS was smaller than for most other utilities. For example, SAWS billed 49% of meter tamper cases. Billed lost revenue collected was 312%[34] of RA expenses, meaning that for every $100 spent on RA $312 was collected. In comparison, leaders in the peer panel collected over $1,700[35].

## 4.4 Organization

SAWS runs Customer Service operations similar to other utilities in a number of ways. It operates across seven functional areas (Contact Center, Billing, Payment, Meter Reading, Field Services, Credit & Collections, and Revenue Assurance) and it conducts most activities internally. SAWS also offers digital / self-service options to customers in select functions, and operates four customer payment locations.

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[31] PA's Polaris Benchmarking Analysis

[32] PA's Polaris Benchmarking Analysis

[33] Unavailable due to SAWS current technology system limitations

[34] PA's Polaris Benchmarking Analysis

[35] PA's Polaris Benchmarking Analysis

Based on the organization charts and staffing details provided, the span of control is 1:9.97[36], or approximately 10 employees per supervisor, which is a very good span of control. The division has 6 levels and is organized in a logical manner oriented around function.

## 4.5 Technology

SAWS' organization employs a range of technologies typical for a utility of its size. Employees exhibit an array of different capabilities and technical sophistication, ranging from above- to below-average. Typically, each area uses software appropriate to assist in task completion. For example, the Contact Center uses an IVR and a switch that manages calls, while Billing uses a customer information system. There are tracking systems for field service orders as well as credit and collections activities. Meter reading inputs are recorded and transferred into the customer information system.

Very limited analysis was performed on Contact Center technology performance metric outcomes compared to how other companies perform these functions. There are opportunities for improvement by leveraging applied technologies to increase self-service transactions and to enable more effective operational support.

### 4.5.1 Self Service

Self-service metrics do not include expense metrics, only service level elements. Most self-service metrics were either below average or not available. The breakdown of self-service metrics below provides context on SAWS' relative position to peer panel outcomes:

- Non-Payment Website Customer Transactions Per Total Live Calls – not available for SAWS – this metric is an indicator of automation or self-service of customer transactions. More website transactions and fewer calls indicate higher service levels and a more desirable mode of operation consistent with customer service trends.
- Percent of Payments Processed Electronically – SAWS benchmarked above the average of the peer panel (Q1). A higher ratio leads to lower costs due to more automation and fewer mistakes.
- Automatic Web Transactions Per Customer – not available – the lower numbers of automatic website transactions per customer indicates an opportunity for SAWS to reduce costs associated with direct contact service.
- E-bills Percent of Total Bills – SAWS ranked in Q2 when compared to the peer panel when measuring the ratio of electronic bills to total bills (Q2). More electronic billing lowers costs and raises customer satisfaction.
- Percent of Total Incoming Calls Completed by Company or Outsourcer Integrated Voice Response (IVR) – SAWS placed in the lowest quartile of the peer panel in this metric (Q4). The more calls completed within IVR, the lower the costs and less impact on Contact Center operations.
- Self-service Phone and Online Contacts Per Phone and Online Contacts – not available – a measurement of IVR and automated website transactions where the higher the ratio, the lower the costs.

IVR: The current state of the IVR structure represents a significant operating challenge. It suffers from several limitations, some of which are being currently addressed. However, further enhancements are needed to increase IVR uptake to levels typically experienced by other utilities, which is about twice as many calls completed in IVR compared to current rates. Most are relatively simple enhancements that center on changing the IVR structure to make it more user-friendly.

[36] PA Analysis

Website: The website currently has limited capabilities and therefore, not surprisingly, low utilization. Specific changes to the website would increase its usage and reduce live call volume. Such changes would be in line with industry website operations. Utility industry websites typically function as part-corporate, part-customer service, sites, rather than a full capability Customer Service website. Most visits to a utility's website come from customers who want to complete transactions online, rather than customers who are interested in corporate information. A website needs to be geared to provide that service. Website capabilities are best measured by the ratio of live calls to non-payment website visits. A strong website has a ratio well above one. The current website at SAWS is estimated to have a ratio of less than one, which means it is underutilized.

## 4.6 Policy and Strategy of Customer Payment Centers

Customer payment centers have historically played an important role in communities, providing utilities with a communication channel to their customers and allowing customers to meet directly with utilities to make payments, ask questions, and learn more about offered services. These centers were frequently the most important access points to customers and allowed customers to resolve problems that could not easily be handled via phone or service visit. The high labor costs associated with these centers were considered the cost of doing business as alternatives to reduce transaction costs were limited.

As technology has advanced in communications (e.g. Internet), remote interactions (e.g. email, streaming-video), and payments (e.g. direct deposit, online payments, in store), the need for customers to use these payment centers has become redundant. Over the past two decades, most utilities have reduced or eliminated these centers and have successfully empowered their customers to use alternate means for transactions. This has had a positive impact by both reducing the time and effort for customers to complete transactions, increased payment options, and reduced the transaction costs for the utility, enabling overall system savings for customers. However, we observed that SAWS' policy has been to continue to offer local payment center service.

The annual current cost of operating four customer payment offices is approximately $1.3 million[37]. At present, the per transaction cost of a walk-in payment is $3.58[38] on average and ranges from $2.01 at Las Palmas to $5.40 per transaction at Southcross. If no action is taken in the near term these costs are expected to continue.

## 4.7 Recommendations and Estimated Benefits

PA identified specific recommendations regarding organization restructuring, business process, technology utilization improvement, and corporate policies.

### 4.7.1 Organization Restructuring Related Recommendations

**Recommendations**

- Combine Quality & Training with Customer Care under single management – these two elements fit naturally together because quality is ultimately displayed in customer interactions.
- Combine Field Operations and Billing under single management – these two areas are part of the same value chain and single management results in more focused and stronger outcome operations.
- Combine Customer Care Contact Center and in-bound Credit and Collections calls together for single management, common operating philosophy, and flexibility in assigning agents.

[37] PA Analysis

[38] PA Analysis

### Estimated Benefits

Consolidation under single management of the above functions is anticipated to result in approximately $324,000[39] in savings through the reorganization of management and staff and examining the group's resources and responsibilities. It is recommended that these proposed resource re-directions be managed in a non-disruptive manner over an 18-month period.

## 4.7.2 Business Process and Technology Utilization Related Recommendations

PA has developed several recommendations regarding process, capability, operational, and technology modifications across the various functional areas. These changes, based on our professional experience and implementations by industry peers, typically result in reduced expenses and improved service levels via a reduction in mistakes and non-value-adding activities. Since benchmarking results provide high level guidance, these areas should be further scrutinized to evaluate full improvement opportunities that would be appropriate for SAWS.

### Business Process Related Recommendations

- Billing – The primary focus should be on reducing the volume of no-action exceptions and post-mail adjustments. High volume of exceptions is generally associated with incorrect parameters. Changes in parameters will result in lower volume of unnecessary exceptions. Further changes in operations will result in fewer post-mail adjustments. The net outcome is that there will be less corrective or manual work in this area, resulting in the need for fewer employees.
- Contact Center – High volume of short duration calls suggests an opportunity to reduce them through improvements to IVR capabilities. Other low service level outcomes are typically associated with inadequate call handling capabilities and supervisor roles. The other challenge is that incoming calls are not fully aligned with agent availability, resulting in relatively low agent utilization. Proposed changes will reduce the number of live calls. Improved handling of remaining calls will reduce their duration and costs, or enable more time to handle customers with difficult issues.
- Credit & Collections – There are three areas of potential improvement associated with this area:
  - Information – SAWS has limited data regarding receivables,
  - Processes to manage customers along various delinquency stages – there are some rules of thumb and approaches that are considered most effective at reducing delinquency, and
  - Inbound Credit & Collection call handling – organizationally, these calls should be placed under single management in the Contact Center to promote common approaches to call handling. These measures are expected to result in reduced effort associated with delinquency management.
- Development of Revised Reports and KPIs – Actionable reporting provides important feedback to management regarding Customer Service's financial and operational conditions and outcomes. Such reporting is simultaneously minimal and focused on key data. Reporting is aligned with KPIs that are used to guide employees as to what matters regarding operations. KPIs are established to meet desired performance requirements, which are needed for disciplined and structured operations

### Estimated Benefits

- Billing – Savings are calculated to be approximately $147,000[40] due to reduction in the number of exceptions and adjustments.

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[39] Calculation basis provided to SAWS separately

[40] Calculation basis provided to SAWS separately

- Contact Center – Savings are calculated to be approximately $147,000[41] due to call handling procedures.
- Credit & Collections – Savings are calculated to be approximately $196,000[42] due to reduction in work volume.
- Development of Revised KPIs and Reports – Annual savings are calculated to be approximately $196,000[43] due to improved management and increased transparency.

### Technology Related Recommendations

- IVR – Significant changes to the current IVR structure are required to increase its utilization in order to reduce costs and improve this channel for customers. Current customer service related website utilization should be doubled from the current 27% to 54%[44] by taking advantage of different features available for programming within the IVR. The benefit lies in replacing live calls, where possible, with self-service transactions that are less costly than live transactions by at least an order of magnitude.
- Website – Customers are being conditioned by service providers to use websites when needing to complete transactions. Once transaction processing capability is developed, the marginal cost of additional transactions is low. Instead of live calls, transactions completed on a website cost much less and can be completed by customers at their convenience. The current website offers SAWS numerous opportunities to improve its customer service and simultaneously increase the number of completed transactions by several hundred percent. The benefit comes from reduced customer service costs by using self-service website features instead of live calls.
- Automated Metering Infrastructure - PA understands that CPSE is currently implementing an Automated Metering Infrastructure program for its Electric and Gas Customers, partnering with Silver Springs Network. CPSE has invited SAWS to participate with them as a fast follower in implementing their solution with potential savings to SAWS from sharing infrastructure and applications. This opportunity should be further investigated to determine whether there is a business case to replace manual meter reading with this technology.

### Estimated Benefits

PA has quantified benefits related to each of the above areas as follows:

- IVR – Annual savings are calculated to be approximately $147,000[45] in the contact center area.
- Website – Annual savings are calculated to be approximately $147,000[46] in the contact center area.
- Automated Meter Reading - Investigate business case feasibility of AMR or van drive-by options. Possible benefits from the collection of hourly or daily interval data include the following:
- automated leak detection (water loss),
- web presentment to improve customer engagement and consumption education,
- communication of usage patterns to enhance conservation as well as influence and enforcing conservation objectives, and
- understanding state of meter health.

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[41] Calculation basis provided to SAWS separately

[42] Calculation basis provided to SAWS separately

[43] Calculation basis provided to SAWS separately

[44] PA's Polaris Benchmarking Analysis

[45] Calculation basis provided to SAWS separately

[46] Calculation basis provided to SAWS separately

### 4.7.3 Policy Related Recommendations

PA recommends that SAWS further evaluate its policies with regards to operating customer payment locations.

#### Recommendations

- There have been two dominant trends in the utilities industry regarding payments – elimination of face-to-face payments at utility facilities and a drive towards electronic payments to minimize human interventions. Keeping local payment centers open to accept utility payments is very expensive due to idle times between payments and intrinsically high costs associated with accepting manual payments. At a typical utility in the PA panel of peer utilities, very few payments occur at local payment centers, as this is an outdated manner of accepting customer payments.
  - Closure of one location: The Southcross payment center appears to be the most logical choice in order to determine the impact of reducing a payment center on customers and existing business processes. The facility is owned by SAWS and does not carry a long term lease. The cost per transaction at this facility is the highest of all facilities ($5.40)[47], and any unexpected influx of customers from this payment center to other payment centers would be minimal (this location only accounts for 12%[48] of all walk-ins).
  - Closure of all locations: This decision should be driven by business decisions and dominant changes that are occurring in the industry as well as local customer feedback and stakeholder input into this overall policy.

#### Estimated Benefits

PA has quantified benefits as follows:

- Closure of one customer payment locations – Annual savings calculated to be approximately $252,000[49] is associated with the closure of the Southcross facility. Though PA has calculated approximately $1.1 million[50] in annual savings through the closure of all offices, PA recommends first testing this with the closure of one customer payment location to gauge customer impact and then evaluate potential savings of further closures.

## 4.8 Implementation Costs

PA estimates that SAWS may need to involve a qualified independent expert in this area to assist with programmatic changes. This cost is estimated to be approximately $300,000[51].

PA estimates that it will require approximately $100,000[52] to implement website and customer-facing technology changes.

## 4.9 Net Present Value (NPV) Calculation

- Cost of Capital: 5%
- Timeline: 5 Years

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[47] PA Analysis

[48] PA Analysis

[49] Calculation basis provided to SAWS separately

[50] Calculation basis provided to SAWS separately

[51] Assumes External Expert Costs for Process and Organizational Changes

[52] Assumes costs for website redesign

- Annual O&M Benefits Anticipated: $1,525,000
- One-Time Investment Costs: $400,000 (Assumes $240,000 through the sale of Southcross facility to fund portion of the investment)
- Steady State Target: January 1, 2015
- Expected NPV: $6.85 million
- Inflation Rate: 2.5%

# ENGINEERING AND CONSTRUCTION

# CONTENTS

# 5 ENGINEERING AND CONSTRUCTION

## Overview

Engineering and Construction (E&C) is mandated with the primary responsibilities of integrating new residential and commercial developments into existing water and wastewater systems, maintaining the reliability of existing systems, and providing Geographic Information Systems (GIS) mapping, and provides other support services to the organization. Like most water and wastewater utilities in the nation, this function presents important management challenges, including chiefly:

- The challenge of prioritizing limited capital improvement resources to maintain acceptable levels of reliability and meet growth needs.
- The challenge of managing a complex design and construction process involving numerous third party consultants, contractors, and stakeholders, and multiple handoffs between various departments and sub-functions.

In addition, SAWS agreed to invest additional capital in infrastructure and maintenance to reduce sewer spills in its service area under a settlement, or Consent Decree (CD)[53], with the United States Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ).

To carry out these responsibilities, E&C plans and executes an annual Capital Improvement Program (CIP). For fiscal year 2013, currently budgeted capital needs are $250 million[54]. However, this amount is expected to grow to approximately $390 million[55] in 2014 and then return to around $260[56] million for

[53] Consent decrees are legal actions taken against large polluters that are in violation of the Clean Water Act (CWA).

[54] Information from SAWS

[55] Information from SAWS

the next few years. Consequently, SAWS faces an immediate increase in its typical workload by almost 40 percent in the next fifteen months and a regulatory requirement to incorporate progress reports for compliance with the CD. SAWS has engaged HDR Engineering, Inc. to provide Program Management Services for the Sanitary Sewer Overflow (SSO) reduction program. This effort is expected to identify, through a gap analysis, any additional initiatives or processes required to support compliance with CD, to improve efficiencies, quality, and achieve SSO reduction.

[56] Information from SAWS

## Overall Observations

PA's evaluation of this area focused on E&C's ability to execute the current levels of CIP effectively and efficiently. With 214 FTEs, PA found that the SAWS E&C function is structured and staffed in a manner that is comparable to similar water and wastewater utilities. The major work processes and capital planning philosophy are consistent with other water and wastewater utilities. PA found that opportunities exist to improve technology and work processes performed in the capital planning arena. Tracking projects, reporting progress, and managing process handoffs is currently less effective expected in an organization that manages $250 million annually in capital spending. In light of the CD and a burgeoning CIP over the next few years, we recommend that SAWS consider a technology solution and implement business process modifications to increase effectiveness in executing planned capital work. Such improvements will allow SAWS E&C to realize certain labor efficiencies as well. SAWS has engaged HDR Engineering, Inc. to provide Program Management Services for the Sanitary Sewer Overflow (SSO) Reduction Program. As part of these Services, HDR will perform an assessment of the SSO Reduction Program. This effort will identify, through a gap analysis, any additional initiatives or processes required to support compliance with SAWS anticipated Consent Decree (CD), to improve efficiencies, quality, and achieve SSO reduction. The effort will also determine staffing levels and key process adjustments needed to successfully manage and administer the SSO Reduction Program.

### Areas of Excellence

- *Effective prioritization of capital projects*: The process for prioritizing capital projects is transparent, well documented, and designed to balance overall business needs and ensure a project portfolio approach that aligns resources and activity.
- *Strategic management of government contracts*: SAWS E&C has a specialized Governmental Engineering group that benefits from detailed knowledge of specific contracting arrangements with key government clients. This group effectively manages the varied and, at times, unpredictable demands of these government clients, while simultaneously negotiating design requests to prevent changes from original budgets.
- *Strong governance in vendor management*: The process for selecting vendors, negotiating contracts, and enacting change orders is well defined and has strong governance mechanisms in place.
- *Ability to stay within project budgets*: Project management has been successful in keeping total actual costs within 2-3% of the original approved budget, which puts SAWS at the forefront of its peers.
- *Sensible investment has resulted in fewer wastewater-related incidents*: SAWS has prudently increased investment in wastewater capital projects to improve reliability, which has consequently reduced the number of emergencies.

### Areas of Potential Improvement

- *Lack of automation and technology to track infrastructure projects and reliability:* Each of the E&C sub-functions uses a different system for tracking and reporting project progress. Since agreeing in June 2013 to a CD with the EPA to reduce sewer spills and better maintain its sewer system infrastructure, there has been a substantial change in the level of service required for this area. SAWS must now certify that it is in compliance with the CD or face fines, extended CD timetables, and possible additional CDs for non-compliance. Where it may have been possible to track major construction initiatives manually and with partially automated processes before, SAWS is effectively mandated to implement this type of technology.
- *Improved cross-functional coordination and communication:* We identified several areas across both the CIP and development services processes where coordination and communication between sub-functions could be improved. For example, miscommunication exists between Production and Treatment (P&T) and E&C regarding the completion of projects and the process of incorporating input

into designs. Other important process handoffs include those between contracting and design engineering over solicitation reviews, Geographic Information System (GIS) and engineering over as-built drawings, and inspection and design over constructability reviews.

- *Efficiency of Support Functions.* Opportunities exist to improve the efficiency of the GIS mapping and Backflow Prevention support functions. GIS staff currently must enter information into two separate systems (WTAP and Hansen) due to the inability to store customer information in the Hansen work order system. The implementation of the CIS module in Hansen planned for later this year presents an opportunity for improved efficiency. In addition, another area of inefficiency is the current state of the database used to mail backflow test notices to customers. Due to gaps in the database, the backflow group currently must devote significant time to cleansing data and manually generating some test notices.
- *Improve project prioritization and asset management:* Although the process for identifying needs and prioritizing projects has much strength, SAWS could refine its prioritization process to more explicitly consider costs and benefits and weigh the impact from different kinds of project failure risks. For example, rankings might explicitly identify and weigh impact on customer satisfaction, future maintenance costs, and regulatory compliance. Similarly, although the Level Of Investment (LOI) model currently serves as a guide to condition-based needs, actual financial need may be lower (if equipment is well maintained) or higher (if maintenance has not been performed at sustainment levels). A formal Asset Management program could assist with this evaluation.

## Recommendations and Expected Financial Benefits

PA recommends implementing process improvements that leverage technology enabled efficiencies. Of these programs, PA was able to quantify an expected $589,000[57] in annual efficiency gains and cost savings, which are listed in Table 8 below. In addition to the three recommendations listed, our professional experience has shown that improvements to project prioritization and asset management can yield cost savings. However these are harder to quantify and will require a more focused analysis and therefore are not counted towards any efficiency savings as part of this study.

**Table 13: Recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Implement a Capital Project Management System (CPMS) | Positions | $229,000 due to technology related efficiencies |
| 2. | Improve coordination and communication among sub-functions | Process | $210,000 due to improved coordination due to business process modifications |
| 3 | Eliminate double entry of data | Positions | $150,000 due reduced data entry requirements. |
| | **Total savings** | | **$589,000*** |

* NPV is calculated to be approximately $1.54 million under the following assumptions:

– Assumes one time investment of $1.2 million for a Capital Program Management System.

[57] Calculation basis provided to SAWS separately

– Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
– Benefits being accrued between January 1, 2015 and December 31, 2019.
– Discount rate of 5%.
– Inflation rate of 2.5%.

## Introduction

Engineering and Construction (E&C) is mandated with the primary responsibilities of integrating new residential and commercial developments into existing water and wastewater systems, maintaining the reliability of existing systems, and providing Geographic Information Systems (GIS) mapping, and other support services to the organization. Like most water and wastewater utilities in the nation, this function presents important management challenges, including chiefly:

- The challenge of prioritizing limited capital improvement resources to maintain acceptable levels of reliability and meet growth needs.
- The challenge of managing a complex design and construction process involving numerous third party consultants, contractors, and stakeholders, and multiple handoffs between various departments and sub-functions.

In addition, SAWS agreed to invest additional capital in infrastructure and maintenance to reduce sewer spills in its service area under a settlement, or Consent Decree, with the United States Environmental Protection Agency (EPA) and the Texas Commission on Environmental Quality (TCEQ).

- To carry out these responsibilities, E&C plans and executes an annual Capital Improvement Program (CIP). For fiscal year 2013, currently budgeted capital needs are $250 million. However, this amount is expected to grow to approximately $390 million in 2014 and then return to around $260 million for the next few years. Consequently, SAWS is facing an immediate increase in its typical workload by almost forty percent in the next fifteen months and a regulatory requirement to incorporate progress reports for compliance with the CD.

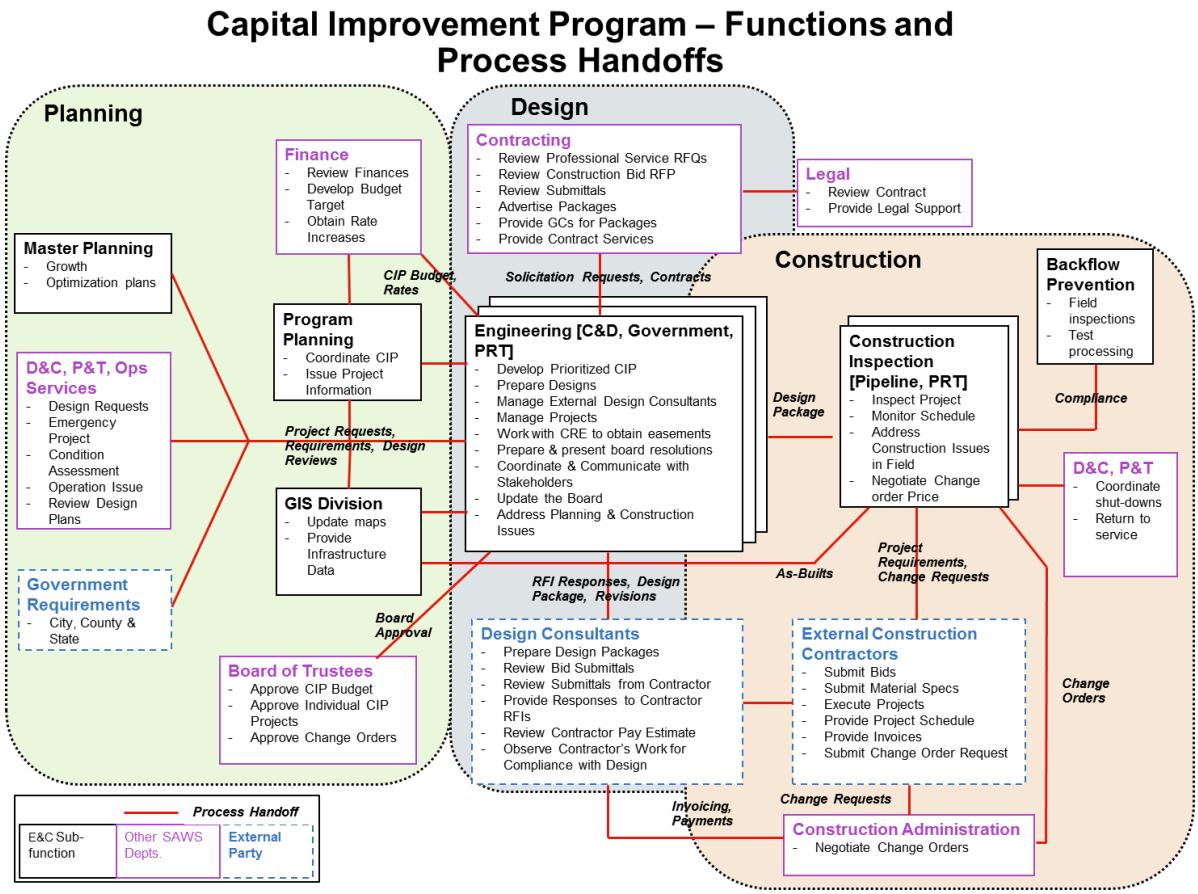
## 5.1 E&C Overview

E&C is responsible for two major work streams and also provides a range of engineering, construction, and support services to assist with these work streams. The first major work stream, the Capital Improvement Program (CIP), includes identifying capital needs, prioritizing projects, and managing engineering design and construction. The second major work stream, Development Services, involves working with developers to integrate new developments into the existing water and wastewater systems. In addition to these two major work streams, E&C includes a number of sub-functions whose job is to provide engineering services both to support the CIP and Development Services work streams, as well as support other activities across the organization.

### 5.1.1 CIP Work Stream Overview

The following diagram illustrates the E&C sub-functions that participate in the CIP work stream.

**Figure 8: E&C sub-functions that participate in the CIP work stream**




*Source: Developed by PA based on interviews with E&C sub-functions*

E&C sub-functions are depicted as rectangles with black borders, other SAWS departments functions are shown in purple, and external parties are shown in light blue. Red lines show process handoffs and interactions between sub-functions.[58]

The CIP work stream consists of three phases – capital planning, design and construction. The three stages of the process can be viewed from left to right in the diagram. On the left are sub-functions and process interactions associated with capital planning and project prioritization. In the middle are sub-functions and interactions related to engineering design. Finally, the right half of the diagram illustrates construction and inspection and the handoff back to operations.

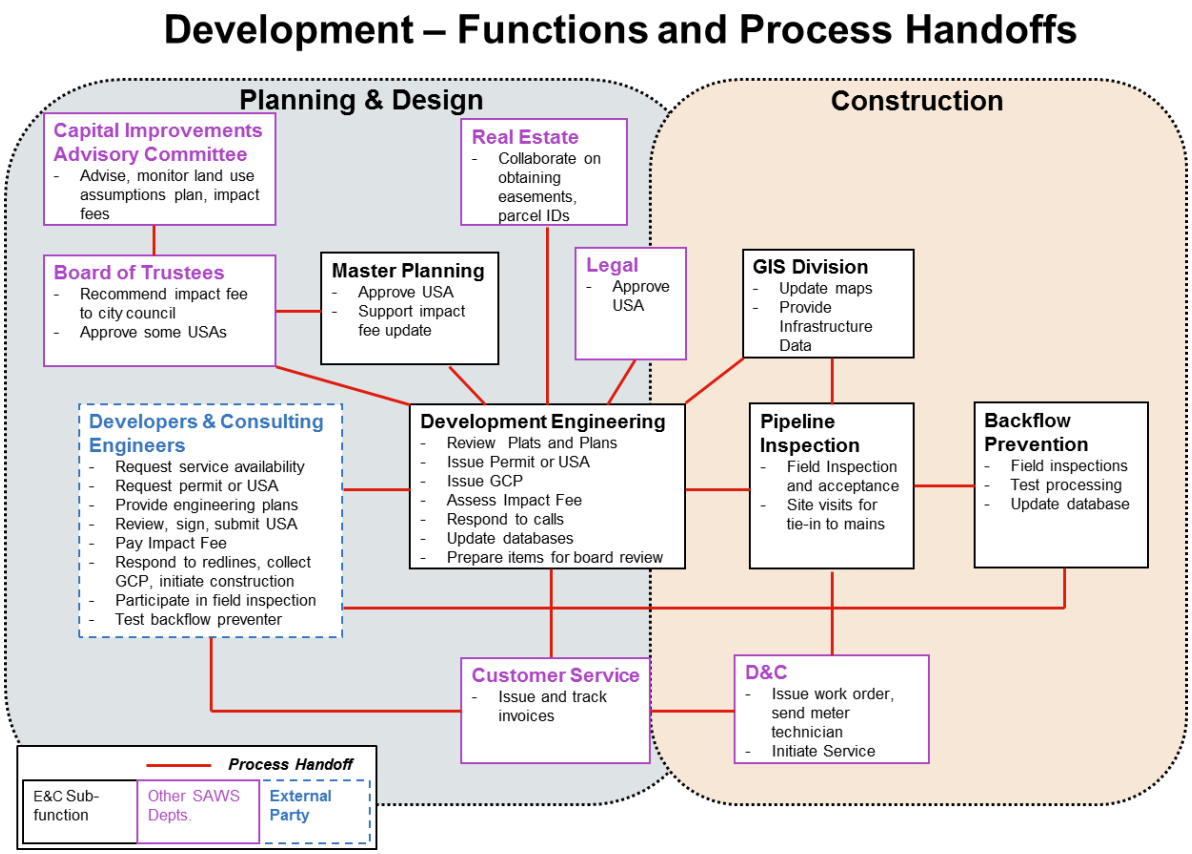
Over a hundred individuals from the E&C Department are involved in the CIP work stream in some form or another. These individuals interact extensively with other departments as shown above.

## 5.1.2 Development Services Work Stream Overview

Sub-functions involved in the development services work stream are shown below. Several sub-functions (GIS, Master Planning, Pipeline Inspection, and Backflow Prevention) are involved in both the CIP and development services work streams. In addition, development services activities involve interaction with multiple additional SAWS departments, including Legal, Distribution & Collection, Customer Service, and Real Estate.

[58] E&C is a department/division. CIP is a work stream, Planning is a Function, and Master Planning is a sub-function.

**Figure 9: Sub-functions involved in the development services work streams**




*Source: Developed by PA based on interviews with E&C sub-functions*

The development services work stream diagram above can be used to understand how the different sub-functions interact. On the left, developers and their consulting engineers request permits and provide plats and plans. In the center, the Development Engineering Services Division processes applications and issues permits, Utility Service Agreements (USAs) and General Construction Permits (GCPs), with input from multiple sub-functions and departments. Finally, on the right the inspection and backflow prevention sub-functions inspect construction in the field.

It is clear from the two figures above that the CIP and Development Services work streams are not always distinct and often interdependent. At times, SAWS makes a decision to "oversize" infrastructure for new developments to accommodate likely future growth. Oversizing is funded by SAWS and is considered part of the CIP. As a result, Development Engineering must work closely with Master Planning and with other engineering sub-functions to plan and prioritize CIP investment to ensure that growth, as well as condition requirements are met.

Over a hundred individuals from the E&C Department are involved in the Development Services work stream in some form or another. These individuals interact extensively with other departments as shown above.

### 5.1.3 Engineering Services Support

E&C includes a number of sub-functions whose job is to provide engineering services both to support the CIP and Development Services work streams, as well as support other activities across the organization. These sub-functions collectively make up Engineering Services and include:

- Master planning: Develops system-wide master plans for growth and optimization of infrastructure. It assists in updating impact fees, and provides hydraulic modeling to support the CIP and other initiatives. Master Planning also provides engineering support to operations, maintenance and other departments.
- GIS: Manages spatial data, updates infrastructure records, and provides mapping services to the organization. GIS also develops custom applications to support the work of other sub-functions.
- Backflow prevention: Manages the inspection of backflow preventers for new developments, mails notices, and processes test reports for existing developments.

## 5.2 Evaluative Criteria Employed

In evaluating the efficiency and effectiveness of the current state of the E&C function, we analyzed the following aspects:

- Organization: Evaluation of the general organization, sub-functions included, and overall span of control.
- Business Processes: Evaluation of the effectiveness of work processes.
- Technology: Utilization of technology.
- Strategy and Policy: Evaluation of strategies and policies in the areas of capital planning and project management.

## 5.3 Organization

The E&C function has approximately 214[59] FTEs managed by 47 managers, resulting in an average span of control of approximately 5 employees per supervisor. There were 13 supervisors who managed only one individual each. Many of these "supervisors" are in fact "working supervisors" with slightly more seniority and consequently also manage one employee. In our discussions with other utilities comparing organization structures and staffing responsibilities, we noted that this is a common practice in the E&C function across the industry.

In order to evaluate the reasonableness of E&C's general organization structure and benchmark staffing at the sub-function level, PA interviewed individuals at the Vice President level from two water/wastewater utilities and one sole water utility with comparable levels of CIP spending (approximately $250 million). Findings from these interviews are provided below:

An East Coast water and wastewater utility with comparable level of CIP reported having approximately 264 FTEs[60] with the following type of general organization structure and FTE counts:

- Capital Planning and Design: 92
- Construction and Inspections: 106
- Surveying and as-built drafting: 46
- Project Management: 20

Another East Coast water and wastewater utility with comparable CIP reported having approximately 164 FTEs[61] with the following general organization structure and FTE counts:

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[59] Source: "PA Engineering 2," provided to PA on 5/24/2013

[60] Interview conducted by PA

[61] Interview conducted by PA

- Program Management: 8
- Design Group (split as General, Electrical, Mechanical): 33
- Surveying: 5
- GIS: 5
- Planning: 8
- Permitting: 7
- Construction Management: 38
- Inspection: 19
- Quality Assurance: 3
- Project Controls: 5
- Management Services (Budgeting and Forecasting): 3
- Documents and Standards: 10
- Special Projects: 18
- Division Management: 2

The third utility we interviewed was a water utility in the West with slightly less CIP having approximately 177 FTEs[62] with the following type of organization structure and FTE counts:

- Program and Project Design: 60
- Surveying: 27
- Administration: 6
- Property Management: 37
- Construction Supervision: 26
- Asset Recording (GIS): 13
- TAP Locates: 8

We also contacted Los Angeles Department of Water and Power, Detroit Water & Sewerage Department, and Louisville Water to understand how the E&C function was structured and did not find a "one model" approach that existed with respect to what is and is not included within this function. However there was consensus that the following functions were viewed as "core" E&C functions:

- Planning, Design, Project Management, and Project Closure were viewed as core CIP Development activities within the Engineering function. SAWS has approximately 87[63] FTEs dedicated to oversee this type of work.
- All utilities we interviewed outsourced the actual construction activity but had dedicated staff to oversee and inspect the construction work. SAWS follows a similar philosophy and has approximately 66[64] FTEs dedicated towards this.
- Beyond the above two areas, PA found quite a bit of variation in what else was including in the E&C function with the rest being viewed as "support" or "non-core areas." SAWS has approximately 61[65] FTEs dedicated to these "non-core" functions within the E&C area.

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62 Interview conducted by PA

63 Source: "PA Engineering 2," provided to PA on 5/24/2013

64 Source: "PA Engineering 2," provided to PA on 5/24/2013

65 Source: "PA Engineering 2," provided to PA on 5/24/2013

With a total staffing of approximately 214 FTEs, PA found the SAWS E&C function to be in an acceptable band of overall FTEs (164 to 271 was the general range on FTE counts based on utilities interviewed). It is difficult to perform an exact comparison between utilities in this area due to a variety of factors that impact workload such as contracting authorization limits and vendor policies, outsourcing decisions, inspection requirements, the level of technology being utilized, as well as the nature of the specific CIP projects being undertaken and the expertise required.

During our interviews with SAWS personnel on the topic of organizational structure, PA found that E&C had recently reorganized its Operations and Maintenance Engineering staff to be part of a single Master Planning function. This change strengthens the planning function and moves the organization closer to a more straightforward division between planning, design, and construction observed elsewhere in the industry.

PA also found several facets of the organization structure to be somewhat unique.

- E&C organizes work not only by phase, but also by customer type – chiefly by including a separate Governmental Engineering group. As noted, this division is sensible due to the different contract structures and design standards that government work involves, the unique government planning cycle, and due to the volume of work with common government agencies.
- The GIS division, though a part of E&C, plays a major role in supporting other parts of the SAWS organization as well.
- Finally, the inclusion of PRT Construction Inspection as part of PRT Engineering – and separate from the other inspection group – is somewhat unique.

PA has not performed a detailed workload analysis to validate the efficiency of such structure but based on multiple interviews we have had with staff from different levels from the E&C function, PA can understand the value of such type of an organization for serving the needs of various client types.

SAWS has engaged HDR Engineering, Inc. to perform Program Management Services for the Sanitary Sewer Overflow (SSO) Reduction Program. As part of these Services, HDR will perform an assessment of the SSO Reduction Program. This effort will identify, through a gap analysis, any additional initiatives or processes required to support compliance with SAWS anticipated Consent Decree (CD), to improve efficiencies, quality, and achieve SSO reduction. The effort will also determine staffing levels and key process adjustments needed to successfully manage and administer the SSO Reduction Program.

## 5.4 Business Processes

To evaluate the effectiveness of the E&C function, we examined the major sub-functions of the CIP and Development Services work streams separately.

### 5.4.1 CIP Planning

#### Overview of Current Process

CIP planning has two components, - Needs identification and project selection. Needs are identified on an ongoing basis and used to inform a yearly cycle of budgeting, project prioritization and selection.

***Needs Identification***

Several different types of engineering and construction needs are identified as part of the CIP; growth-based needs, condition-based needs, and a variety of others. Growth-based needs translate into capacity expansions required to meet future new developments and demand. The identification of growth-based needs is led by the Master Planning and Water Resources Departments. Master Planning engineers use hydraulic modeling and other methods to compare the current capacity of the water and wastewater

systems against projected future demand. Recommendations include specific locations and timing of necessary capacity expansion. The Water Resources Department advises on the adequacy of the water supply.

Condition-based needs are repairs and upgrades to existing infrastructure. They tend to be identified jointly by the operations and engineering departments. The Production and Treatment (P&T) and Distribution and Collection (D&C) sub-functions provide condition assessments and make specific requests for where capital improvements should be made. The Collection and Distribution (C&D) and Production, Recycle, Treatment (PRT) engineering sub-functions then validate those requests and then build on them as needed. Condition-based needs may also include upgrades or improvements necessary to meet regulatory requirements. Finally, an overall target for condition-based investment is established by Finance using a financial model termed the "level of investment" (LOI) model. The LOI model determines the level of investment needed to replace infrastructure over a long-term recapitalization period. These periods are defined as 50 years for D&C facilities, 50 years for P&T structures and 25 years for P&T equipment. The target LOI is the plant replacement value divided by the recapitalization rate.

In addition to growth and condition-based engineering and construction needs, the CIP also includes water supply, facilities, and information services.

#### *Project Selection*

Engineering and construction needs are translated into an updated one-year, five-year and long-term CIP investment plan through an annual budgeting and prioritization process. The process is led by E&C with collaboration from Finance, P&T, D&C and other groups. The SAWS Executive Management Team (EMT) prepares a final recommendation that is considered for approval by the Board of Trustees.

Development of the CIP includes several stages. First, Finance provides a budget target. Second, engineering sub-functions collect and validate needs from Master Planning and other functional owners. Projects are then scored using a ranking system based on risk exposure, and then ranked and grouped by category. Scores are used by the SAWS EMT to aid in determining which projects to fund in the current year, and which projects to defer to subsequent years.

### Areas of Excellence

The SAWS CIP Planning process has several strengths. Overall, the process is transparent, well documented, and designed to elicit input and build consensus among multiple departments and stakeholders. In particular, the process:

- Explicitly captures input from multiple sources and in multiple forms. Input is sought in the form of long-term growth projections, condition assessments from P&T, D&C, Engineering, and Financial Planning.
- Balances competing needs using an objective and transparent prioritization process. Risk scores are calculated for each potential project to allow for an objective comparison.
- Leads to the production and regular updating of short, medium, and long-term plans. The CIP process provides a clear road-map of investment strategy. Those needs that are not addressed immediately are tracked and considered in subsequent years.

### Opportunities for Improvement

There are two opportunities for improvement in the CIP planning process.

- First, the method used to score and rank projects could be improved. This is discussed in more detail in the policy and strategy section of this chapter.
- Second, from a process standpoint, SAWS could also do more to improve on its capability in asset management. Currently, opportunities for condition-based investment are based on problems reported

by D&C, P&T and others, with an overall investment target set by the Level of Investment (LOI) model. SAWS lacks a comprehensive assessment of need based on physical inspections of assets. SAWS has made improvements in this area by embarking on an effort to inspect every collection system and categorize the condition into one of three categories ("no work needed," "go back and monitor," "needs immediate work"). Production and Treatment Engineering also conduct full "walk-throughs" with P&T Operations as a part of CIP planning. An opportunity exists to expand and systematize these programs into a comprehensive asset management program. This would improve the ability to plan for long term investment needs, maximize life-cycle value of assets, and ensure that important failure risks are identified.

## 5.4.2 CIP Engineering Design

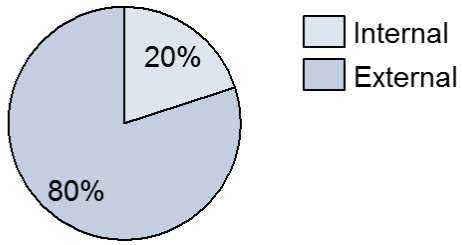
### Overview of the Current Process

Engineering design for the CIP coordinates with three engineering sub-functions: Collection & Distribution (C&D) Engineering, Production Recycle & Treatment (PRT) Engineering, and Governmental Engineering. The design process involves several important handoffs and interactions. Design engineers must work with Master Planning, D&C, P&T, and government entities to understand needs, work with contracting to select and manage design consultants, work with design consultants to produce acceptable designs that meet specifications and standards, and work with construction inspectors to ensure that designs meet 'constructability' standards. The engineering sub-functions also prepare board resolutions to seek approval of the CIP and for change requests.

#### *Approach to Outsourcing, Insourcing, and Contracting*

SAWS uses a mix of insourcing and outsourcing to produce engineering designs. For larger, more complex projects, designs are outsourced to design professionals through a competitive, qualification based selection process. Simpler projects that can be done quickly, such as pipe-breaks, are designed in-house. The current mix of insourcing and outsourcing balances these priorities.

**Figure 10: Approximate distribution of project design work between internal and external**




*Source: "PA Engineer 5," provided by SAWS to PA on 5/24/2013*

#### *Design Project Management and Execution*

The major tasks of design project management are ensuring that designs are produced to specifications and standards, on time and on budget, and ensuring that the relevant input is obtained from P&T, D&C, construction inspection, and (in the case of Governmental Engineering) external government parties. Design reviews are held at 60% and at 90% completion to solicit input.

Each of the three engineering sub-functions use separate and slightly different methods for tracking and reporting design (and construction) progress. C&D Engineering separates projects into urgent/emergency and planned, and maintains a spreadsheet list of projects for each that includes a column for running status updates. Governmental Engineering creates a monthly report using a combination of MS Access and Excel that lists projects by client and project phase. PRT Engineering produces a monthly report in

MS Word that lists all current projects in design or construction, with estimated percent complete, status notes, and plans for coordination with end users. PRT Engineering also produces a high level visual chart that shows the overall timeline for when projects will enter design, bid and construction stages.

### Areas of Excellence

Engineering design has the following strengths:

- Although designs do occasionally run into delays, engineering sub-functions have historically been effective at bringing engineering design work to completion on time and within the budget set by the CIP. In addition, overall budget performance in the construction phase suggests that designs do meet standards and specifications and that the majority of major issues are addressed before designs are released for bidding and construction.
- The organization of design work between C&D, PRT, and Governmental Engineering also allows productive collaboration and specialization. A dedicated group within C&D Engineering is responsive to emergency needs and works closely with D&C on the problem of sanitary sewer overflows.
- The Governmental Engineering group benefits from strong knowledge of particular contracting arrangements and tendencies of government clients. This group does well to meet varied, and at times, unpredictable demands of government clients while also resisting unnecessary design requests that would add excessive cost for SAWS.

### Opportunities for Improvement

The following areas could improve coordination among sub-functions and improve downstream productivity through modifications to business processes:

- Design quality depends on appropriate involvement from both end users (i.e., internal functions such as P&T) and construction inspectors. End-users understand the actual condition and location of infrastructure, why improvements are needed, specific customer circumstances and requirements for safe and efficient end use. Inspectors understand whether designs have all information needed for construction. Thorough review is essential to discover and correct errors and minimize construction delays, change orders, or problems with operations which might arise later. From the interviews PA conducted, we found that differences in acceptance levels between the E&C and P&T departments occasionally existed. While the majority of the examples provided were minor in nature, SAWS could benefit from a closer evaluation of the underlying process, approvals, and hand-offs and how it is communicated.
- Many groups outside of the engineering sub-functions have work processes that depend on the status and completion rate of engineering designs. When designs are complete contracting begins the construction process with a solicitation request. Construction Inspection takes the lead as projects enter the construction phase. Master Planning, D&C and P&T may need to coordinate plans with improvements that will come into service as a result of these projects. At times, delays and lack of visibility in the design phase cause inefficiencies in dependent tasks, such as Contracting and Master Planning.

### 5.4.3 CIP Construction Management

#### Overview of the Current Process

***Contracting Method – This particular section is covered in the Supply Chain Management section of the Report.***

***Project Management and Execution***

Construction is managed primarily by the two construction inspection sub-functions – Pipeline Inspection and PRT Inspection. Pipeline Inspection is a separate sub-function that manages work initiated by the C&D and Governmental Engineering groups. Pipeline Inspection also manages inspections of new developments – a process that we will describe in the next section. PRT Inspection is connected to the PRT Engineering group under a common Director.

Once contractors are awarded a contract, the contracting department initiates a pre-construction meeting that is coordinated with the contractors, the inspection sub-functions, and all applicable utilities organizations. Inspectors oversee progress throughout construction, provide monthly validations of quantities installed for contractor billing purposes, and perform a final field acceptance.

For the Pipeline Inspection group, projects are assigned to inspectors by geography. The city is divided into four quadrants, and inspectors for each quadrant are assigned a list of open projects for their quadrant. The average number of open projects per inspector at any time is 28[66]. In the past, SAWS considered organizing inspectors by type of work, but continues with the current arrangement in order to minimize time spent driving. PRT work is more technically complex and requires specialized inspectors, many of whom are engineers. Therefore, PRT inspectors handle similar types of projects regardless of the location.

***Project Closeout***

CIP projects are finalized through a field inspection process involving the inspector and the contractor. If construction is 'accepted' a close-out process is initiated through Contract Administration involving a final 'reconciliation' change order. The inspector produces a drawing of the final site condition that is then sent to GIS for entry into the GIS mapping system.

#### Areas of Excellence

Construction management has several areas of strength:

- Overall, individuals report that construction costs are managed to remain within 2-3% percent of budget[67]. In the aggregate, due to constraints set by the finance department, total CIP spending must remain below total budget, as shown in the table below. (The exception in 2011 is a result of spending on activities that was actually spread among multiple years).
- The change order process is rigorous and includes strong oversight. All change orders are reviewed by the inspections group, project engineer, and project design consultant (if needed) to ensure that cost and time extension components incorporated into these change orders are supported and warranted based on the additional work to be performed. Any changes above $25,000 (or changes below $25,000 where approved funds do not exist) are presented to the Board for approval. (The

[66] Information from SAWS; verified through PA interviews

[67] Information from SAWS; verified through PA interviews

$25,000 threshold will be discussed with the Board for consideration to increase the administrative approval for change orders to $100,000 later this year) 68.

## Opportunities for Improvement

We identified a few opportunities for improvement in construction management.

- First, managing CIP spending to match the budget presents a continual challenge as shown in Table 14. For a variety of reasons, including some beyond the control of project managers, actual spending may fall above or below plan. Beginning in 2008, the fall of the housing market led to reduced bid prices, causing spending to fall below budget. In 2012, two major water resources projects were delayed due to reasons beyond the control of project managers, contributing to the under spending of that year. Although SAWS has done well to adjust plans to add additional projects when funds became available, anticipating and responding to deviations between budgeted and actual spending is a continued challenge.

**Table 14: CIP Budget – Variance to Budget**

| | CIP Budget | Committed | Commitment Relative to Budget |
|---|---|---|---|
| 2008 | $233,913,471 | $197,350,877 | -15.6% |
| 2009 | $268,312,684 | $258,356,499 | -3.7% |
| 2010 | $297,567,635 | $296,981,841 | -0.2% |
| 2011 | $251,772,083 | $282,572,030 | 12.2% |
| 2012 | $215,479,296 | $205,115,900 | -4.8% |

*Source: "PA Engineering 2," provided to PA on 5/24/2013*

- Although the change order process provides control over cost, according to our interviews, the Board review process is at times a source of delay and inefficiency. In particular, for some simple changes the number of individuals who must review and comment may be excessive. In addition, the six week time period required to prepare and seek Board approval creates challenges for contractors. At times, contractors need to act on changes much sooner in order to avoid further problems or delays which can also increase costs. In such cases engineers have occasionally sought SAWS Executive override or even initiated changes before the process is finalized. These responses circumvent the normal governance mechanisms and are designed to be used only in exceptional circumstances. Although the number of times ratification (VP override) was used in 2012 was actually quite small (8 out of 215 change orders, or 3.72%)[69], individuals report that the delay can be a source of disruption.
- Each of the Engineering and Inspection sub-functions acknowledges that the process for closing out projects often experiences significant delays. It is common for a year to pass between when the project is beneficially occupied and when the contract is closed. By this time, construction contractors have moved on to other projects and the small outstanding contract amounts are not incentive enough

[68] Information from SAWS

[69] Information from SAWS

to follow through on close-outs. SAWS has recently made progress in reducing this delay by dedicating specific staff in Construction Contract Administration to manage the problem.

- Our interviews with P&T and D&C we found the opportunity to do more to improve communication regarding the close-out process. Although a written process to involve P&T and D&C has been in place for more than a year, the degree of communication and common understanding between P&T and D&C and inspection is low. A lack of common understanding exists regarding what substantial completion entails (i.e. what contractors should be responsible for and what can be passed on to maintenance), as well as low understanding regarding how issues between operations and inspection should be raised and resolved.

### 5.4.4 Development Engineering

#### Overview of the Process

***Issuing of Utility Service Agreements (USAs) and General Construction Permits (GCPs)***

The development engineering process has several stages, the first several of which are coordinated by the Development Engineering group. The process is initiated by external developers or their consulting engineers who wish to receive water and sewer connections to the SAWS system. These stages include:

- Service availability request (optional): Developers may request information on service availability. If such a request is made, SAWS will respond with a description of the service area and a map showing the location of nearby water and wastewater mains.
- Request permit or USA: The consulting engineer next submits a request for either a permit or a USA. USA's are required if one or more conditions are met, including for larger developments, developments with possible environmental impacts, and developments where SAWS will reimburse for oversizing (to meet projected future demand). Where USAs are not required a permit is requested instead.
- Submit engineering plans (if USA is required): Developers that require USAs next submit detailed engineering plans for review by SAWS development engineering. Development Engineering enters plans into a database, reviews designs and provides revisions, and also seeks input/approval from Master Planning, Legal, and on occasion the Board.
- Complete, Approve, and Review USA: All parties review and sign the final USA.
- Release of GCP, Counter Permit or Tri-Lateral Contract: The GCP and Counter Permits are the permits to begin construction. In cases of over-sizing, a tri-lateral contract is issued instead.

Throughout the process, individuals in the Development Engineering division are in frequent contact with developers. In particular, Development Engineering receives numerous phone calls from developers regarding the status of requests and over interpretation of regulations. Although there is a general number, very often developers want to speak to the department manager or specific engineers due to their knowledge of the specific request.

***Inspection & Closeout***

Once the GCP or permit is issued, the project is handed off to the Pipeline Inspection group. Similar to CIP projects, development GCPs are assigned to an inspector based on geography. Pipeline inspectors must be present in the field at certain events, such as during tie-in to mains. In addition, inspectors perform a final field acceptance.

The Backflow Prevention group is also involved during the construction phase. Backflow Prevention advises on the required equipment, performs a final inspection to ensure that the equipment is working, and sends notices of required tests in subsequent years.

### Areas of Excellence

The major strength of the development engineering process is the responsiveness to developer needs. Despite the recent rise in the amount of development in the city, SAWS has maintained and even improved response time to issue USAs and GCPs, as shown in the charts below. The Development Engineering division has made efforts in recent months to streamline how calls are received.

**Figure 11: GCPs and USAs issued by Development Engineering, 2010–2013**

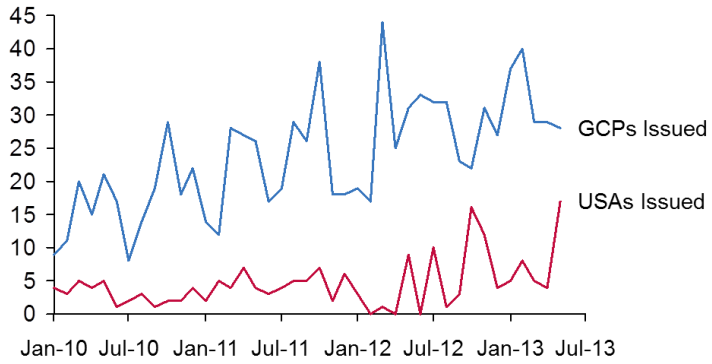
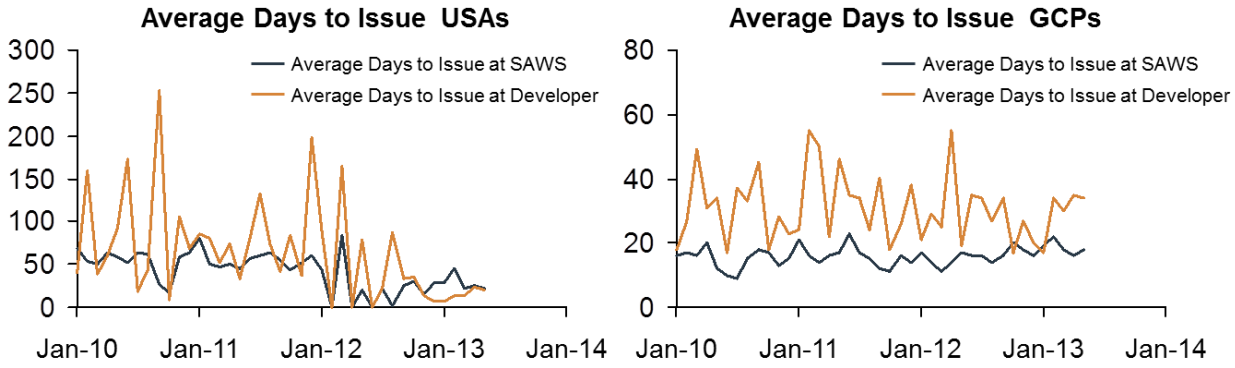



**Figure 12: Average Days to issue USAs | Average days to issue GCPs**




*Source: "2013 May SR USAs GCPs," provided to PA on 6/27/2013*

### Opportunities for Improvement

Call management presents a constant area of opportunity. The Development Engineering group faces a challenge in keeping up with the volume of phone calls from developers. Although the department recently reorganized staffing to improve how calls are answered and routed, individuals reviewing plans are still interrupted often. In part, such interruptions are the nature of the work. However, interruptions and the general reactive mode of review work can create inefficiencies in the review process. In addition, if work falls behind, even more developers begin calling to ask on the status of their requests, causing a self-perpetuating cycle. Although E&C manages to be effective currently, call management is an area where continued monitoring and innovation (for example, online technology to show status visibility) could create opportunities.

## 5.5 Use of Technology

### 5.5.1 Overview of Current Practice

SAWS E&C makes use of numerous forms of technology. These include:

- GIS mapping software, maintained by the GIS division
- CAD drawings
- Flow metering and hydraulic modeling, used by the Master Planning division
- Treatment plant process modeling
- File transfer portals
- Trenchless technology
- Electronic as-builts
- Various forms of project management software
- In addition, multiple departments work with the Hansen work order system used across SAWS.

### 5.5.2 What SAWS E&C Does Well

Of the technology used, SAWS E&C is especially strong in the management of its GIS mapping. While the GIS division had a large backlog of as-built designs to enter into the system in the past, currently the group has worked through this backlog and has performed well regarding entering recently completed work. GIS has also developed applications that are used by other groups throughout the organization, and provides a range of technology-based services. The Governmental Engineering group also reports recent progress in streamlining its data entry and use of technology.

### 5.5.3 Opportunities for Improvement

In the interviews conducted by PA with individuals across the department, we found that many business processes were inefficient and labor-intensive due to a combination of work-around required or a lack of user friendly reports. When we benchmarked Information Technology (IT) costs with peers (discussed separately in the Shared Services section), we found SAWS costs to be particularly low. In PA's experience, however, low IT costs do not necessarily translate into "effective" operations within the IT department. The impact of IT ineffectiveness is most often felt in the field. Our observations confirm our belief that this is the case at SAWS. In particular:

- Several sub-functions report inefficiencies in using the Hansen work order system. Although the SAWS IT department has worked with E&C to custom configure Hansen to meet E&C needs, there is a sense that the system is not easy to use and that some tasks are time-intensive. In part, inefficiencies reflect the challenge of using a common system across both maintenance and engineering functions. SAWS has done well to improve Hansen and eliminate some inefficiencies (for example, the planned implementation of the CIS module in Hansen will eliminate the need for GIS employees to double type some customer information into both Hansen and WTAP). Although we have not done a detailed study in this area, further opportunities may exist to streamline and improve IT processes in E&C.
- Another area of significant inefficiency is the current state of the database used to mail backflow test notices to customers by the Backflow prevention group. Because sporadic backflow information is missing from Hansen system, the backflow group is in the process of manually cleansing and updating its records in order to generate monthly test notices. Although most notices are generated through Hansen and a Data Warehouse/Business Intelligence (DW/BI) solution, the Backflow Prevention sub-function does manually generate 250[70] test notices a month from a legacy system due to incomplete records in Hansen. The process is labor intensive and has resulted in Backflow unable to keep current with all of its letter mailings. Employees believe significant work remains to bring all records into a single location that would enable them to efficiently track test records and mail test notices. E&C could

[70] Information from SAWS

explore ways to complete this process more efficiently in order to speed up the move to an efficient system and eliminate labor intensive tasks.

- The various engineering sub-functions each use a different system for tracking and reporting on the progress of projects in design and construction. Individuals in each group report spending time developing individualized systems. Opportunity exists to develop a common system and streamline tracking and reporting activities.

## 5.6 Policy and Strategy Review

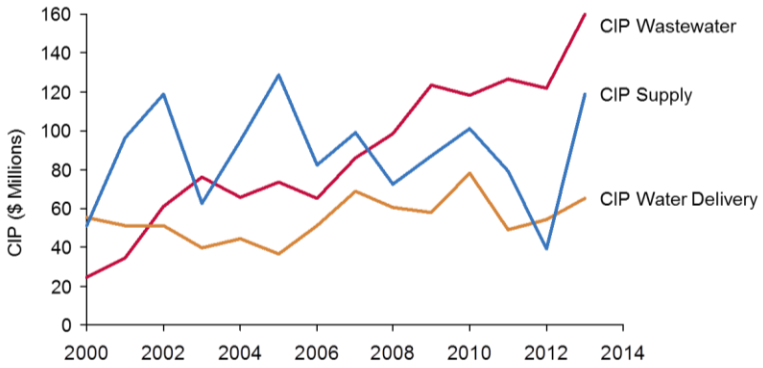
### 5.6.1 Capital Investment Strategy

As described above, the overall level of investment is set through a process involving Finance, E&C and the Board of Trustees. The goal of the process is to maintain a sustainable long term CIP while managing risk and mitigating the impact on rates.

In 2013, the plant replacement value, as calculated by the LOI model, is valued at approximately $5.62 billion[71]. Typically, utilities strive to replace to 1% of their assets in a given year, but replace closer to 0.5%[72]. When considering only CIP investment on main replacements, governmental work (a fraction of which is considered replacement), and treatment (a fraction of which is replacement), SAWS appears to be on par with this performance. Spending on repair and replacement falls short of the LOI model for repair and replacement, but is in the range of 0.5% to 1%[73].

In recent years, SAWS has done well to increase capital spending on wastewater particularly to counteract problems with reliability. The chart below shows that between 2000 and 2013, capital spending on wastewater has increased by more than a factor of six.

**Figure 13: CIP spending by type 2000–2013**




*Source: "PA Engineer 1," provided to PA on 5/24/2013*

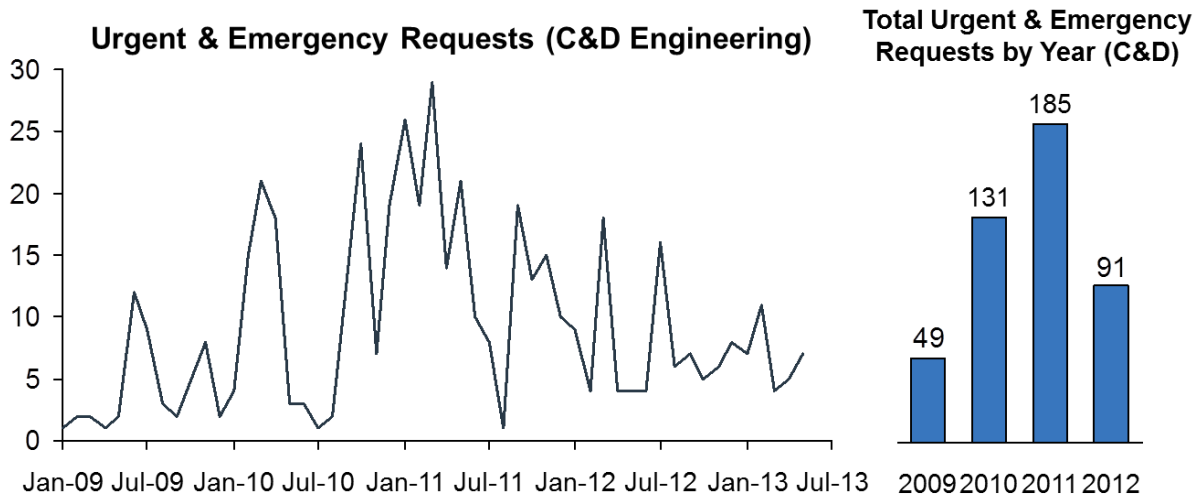
Underinvestment in wastewater was responsible for a large number of urgent and emergency requests in the period around 2010, however, it appears that SAWS E&C has done a good job in reducing the number of these requests in the past two years. The chart below shows that in 2012, urgent and emergency requests submitted to C&D Engineering were half of those in 2011.

[71] Information from SAWS

[72] PA's professional experience

[73] Information from SAWS

**Figure 14: Urgent and emergency requests (C&D engineering) | Total urgent and emergency requests by year (C&D)**




*Source: "RI Status Report," provided to PA by C&D Engineering, 6/28/2013*

### Opportunities for Improvement

Although the department experienced a decline in emergencies, there still exist a high number of emergencies. On occasion, items deferred to a future CIP have failed before funds became available. Spending on emergencies is costly. Although for some items it is cost-effective to run to failure, for others – especially those already identified for later CIPs – the benefits of failures prevented may exceed the cost of replacement. Emergencies require an expedited process that increases project costs, and other planned investments must be deferred to remain within budget. Deferred replacement also produces costs in the form of increased maintenance spending.

## 5.6.2 Capital Project Prioritization Strategy

### Overview of Current Process

As described in the process review earlier, SAWS E&C uses a prioritization method to score potential CIP projects on a common scale. The method used is called Failure Modes and Effects Analysis (FMEA). FMEA analysis leads to a risk exposure score for each potential project, using the formula:

Risk Exposure = Impact x Probability x Mitigation

Impact, probability, and mitigation are each scored on a (1-10) scale. Impact includes the effect of a failure on customer satisfaction, legal or regulatory problems, or safety. Probability is the likelihood of occurrence, and mitigation is the likelihood of being unable to detect and respond to the problem before the impact is felt.

For each factor, a scale is provided to guide scoring. For example, an impact score of "10" is defined as:

- "A potential safety risk, legal and/or regulatory problems - potential loss of life or major dissatisfaction."

Projects included in the CIP can range from 1000 (the maximum score) to scores as low as 200[74]. For example, a draft of potential 2012 CIP projects for discussion included 8 projects with a score of 1000, with an average score of 780 for wastewater, 580 for water, and 512 for water supply.

[74] Information from SAWS

**Table 15: Risk Ratings of potential 2012 CIP Projects (Example draft list used in prioritization process)**

| | Number of Projects | Average Risk Rating |
|---|---|---|
| **Wastewater** | 20 | 780 |
| **Water** | 20 | 580 |
| **Water Supply** | 13 | 512 |

*Source: "2012 Draft Project List: Water and Wastewater," provided to PA, 6/28/2013*

## What SAWS E&C Does Well

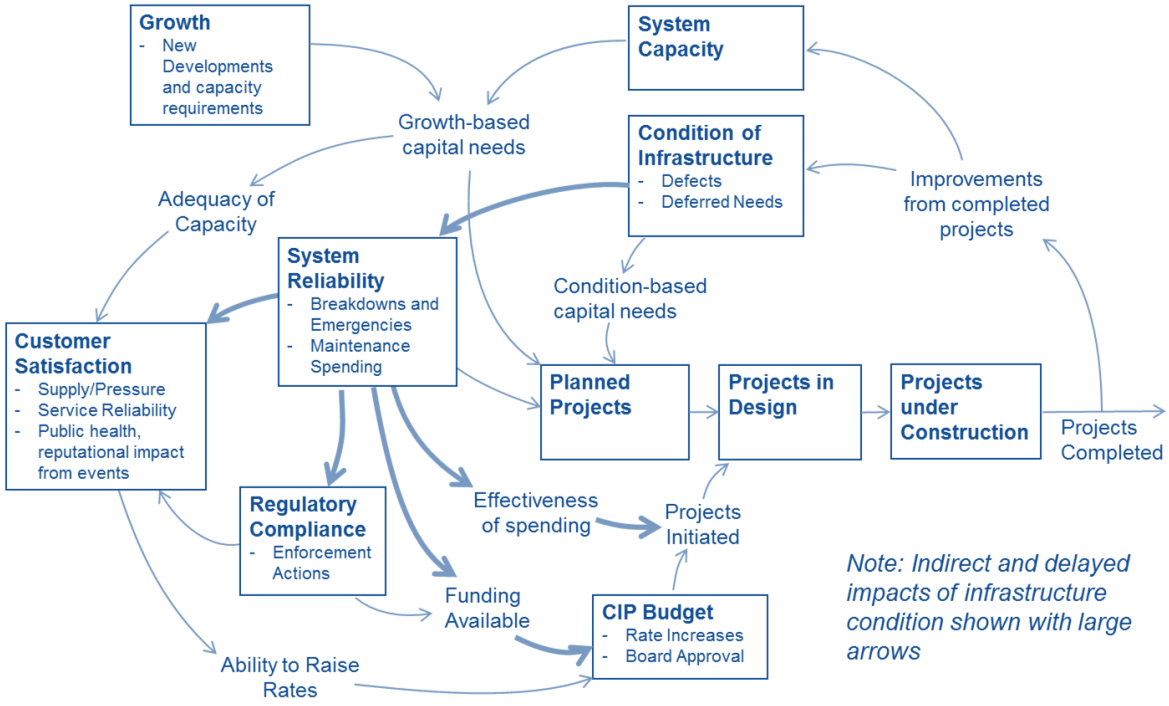
As noted above, the FMEA approach provides an objective and transparent metric with which to compare projects of different types along a single scale. The measure of impact includes risks related to customer satisfaction, health and safety, and regulatory compliance.

## Opportunities for Improvement

The FMEA approach is an excellent starting point. However, opportunities exist to expand on the degree of rigor used to compare projects across different dimensions. In particular:

- The FMEA score does not make explicit the relative weights of different kinds of failures and their impact. For example, how should a project that addresses a risk of inadequate capacity be compared to a project that addresses a risk of increased maintenance costs? In the current approach, it is left to the reviewer's subjective assessment to determine what the "impact" is of each of these failures.
- The current approach does not include a clear calculation of cost and benefits. Projects may exist that provide a high return through reduced emergency and maintenance costs or improved customer satisfaction. Even if risk exposure is relatively low for these projects, it may make business sense to invest in them. A clearer accounting of the available return, including business case analysis, could help in communicating needs to ratepayers, or lead to a rebalancing of priorities to reduce future costs and increase funds available for future CIP projects.
- Very often, the full impact of potential failures can be difficult to assess, lending value to more rigorous analysis. As an illustration, the diagram below shows some of the complex interactions that determine the full "impact" of various failures and investments. The diagram shows the sources of both growth-based and condition-based investment needs, and the range of impacts that can result if these needs are not fulfilled.

**Figure 15: Sources and impacts of CIP investment**




*Source: Developed by PA based on interviews with E&C sub-functions*

For example, consider the box labeled “condition of infrastructure” in the top right. The loop at the right of the diagram shows the typical capital improvement cycle: infrastructure condition determines condition-based needs, which in turn leads to capital projects in the planning, design, and construction phases. As these projects are completed, the condition of infrastructure improves. The condition of infrastructure has direct impacts on reliability, in the form of number of emergencies and failures caused from unmaintained assets.

To understand the full impact of investment (or lack of investment), however, requires a consideration of multiple indirect and delayed effects. Several indirect impacts are shown with larger arrows in the figure above. System reliability has impacts not only on immediate maintenance spending and emergency projects, but on customer satisfaction, regulatory compliance, and on the overall effectiveness of CIP spending in subsequent years. Emergency spending is inefficient and can crowd investment away from planned work. Impacts on customer satisfaction are felt throughout the organization. In some cases, these impacts can drive the cost of deferred investments above what an organization would initially spend to fix a problem in a planned manner.

Given a wide range of potential indirect impacts, investments can differ substantially in the degree to which they provide in improving and maintaining overall organizational performance. Priority should be given to projects that achieve the greatest impact, based on an understanding of the full direct and indirect effects. A more structured approach to investment strategy can help to weigh multiple impacts, creating opportunities to increase the long-term effectiveness of capital investment.

## 5.7 Recommendations and Estimated Benefits

All recommendations made in this area relate to process type improvements achieved either through better utilization of technology or through improved business processes and procedures. PA proposes recommendations in four major areas: 1) Improvements in effectiveness and efficiency due to technology

implementation, 2) Improved coordination and communication between sub-functions due to process improvements, 3) Improvements in the efficiency of support functions, and 4) Improved project prioritization and asset management.

### 5.7.1 Improvements in Effectiveness and Efficiency Due to Technology Implementation

The three engineering functions use different systems to track and report progress across each of the planning, design, and construction phases. Individuals in each of the E&C departments currently spend time, creating and managing systems, using a combination of Microsoft Excel, Access, and Word.

#### Recommendations

- Implement a standardized Capital Project Management System (CPMS) that integrates the "best practices" used by each group and creates efficiencies across the E&C organization. Efficiency benefits expected include:
- Improved ability to monitor status and meet schedule deadlines
- Improved involvement of construction inspection and end-users in design
- Improved visibility to support planning by other sub-functions
- Such a system could easily create consistent monthly and/or weekly reports. Detailed reports could be created for individual groups based on specific needs, and general reports could be created for senior managers to track overall progress and highlight projects at risk.

#### Estimated Benefits

A CPMS would create efficiencies in report generation. A standardized system would reduce time spent collecting information, creating and updating status reports, and responding to information requests. SAWS could achieve productivity improvements of approximately $229,000[75] in savings from elimination of duplicative activities and reduction in manual work processes that should result in labor savings.

### 5.7.2 Improved Coordination and Communication Between Sub-functions

Opportunities exist throughout the CIP and Development Services processes to improve coordination and communication at key process handoffs. In particular, we identified opportunities for improved coordination between:

- P&T and E&C over the process for incorporating input and determining completion status of projects.
- Inspection and Design Engineering sub-functions over constructability reviews and the sequencing of projects.
- Design Engineering sub-functions and Contracting over solicitation review periods.
- Master Planning and E&C over the status of projects in progress.
- GIS, inspection, and maintenance over the status of as-built drawings.
- Development Engineering and Inspection over the pace and volume of work and the availability of information needed by inspectors prior to inspection.
- Although written processes and procedures are available, the degree of communication and common understanding between sub-functions is low.

[75] Calculation basis provided to SAWS separately

### Recommendations

Undertake a review of key processes, especially those mentioned above, to determine areas to streamline, improve coordination and communication among sub-functions, and strengthen process hand-offs.

### Estimated Benefits

PA has not performed a detailed study of various process workflows and so it is difficult to estimate the precise number of hand-offs and the level of workload. Even so, the broad range of opportunities to improve coordination suggests that gains in productivity can be achieved through improved communications and understanding of process hand-offs and elimination of staff rework. PA estimates this to be approximately $210,000[76] in savings gained through labor savings as a result of increased productivity.

## 5.7.3 Improved Efficiency in Support Functions

The GIS group has a staff of 22 FTEs[77], of which several are devoted to data entry. The implementation of the Customer Information System (CIS) module of Hansen (expected to come online later in 2013) will eliminate the need to double type entries in Hansen and WTAP. The Backflow Prevention group currently devotes significant effort to data cleansing and manual generation of some test notices.

### Recommendations

Continue with implementation of the CIS module and improvement of the database for backflow prevention to reduce data entry needs

### Estimated Benefits

SAWS should be able to achieve approximately $150,000[78] in savings through the reduction in personnel once data entry requirements are reduced. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

Improved Project Prioritization and Asset Management

The current approach to project prioritization and asset management is a good starting point. However, opportunities exist to expand on the degree of rigor used to compare projects across different dimensions. Similarly, although the LOI model currently serves as a guide to condition-based needs, actual financial need may be lower (if equipment is well maintained) or higher (if maintenance has not been performed at sustainment levels).

### Recommendations

We recommend SAWS evaluate some improvements to its current capital project prioritization process that incorporates the following concepts:

- Expand the current ranking system to explicitly weight risks based on different failure types.
- Improve weighting of different risks through analysis of the full direct and indirect impact of different types of failures on current and future costs to SAWS.
- Expand use of predictive maintenance to quantify the probability of failure in rankings.

[76] Calculation basis provided to SAWS separately

[77] Information from SAWS

[78] Calculation basis provided to SAWS separately

- Building business cases based on cost-benefit analysis to identify projects with a positive return on investment, including by incorporating heuristics on the full costs of deferral.
  Standard business case tools and parameters for projects above a certain threshold could help in this area.

### 5.7.4 Comprehensive asset management includes:

- Setting targets for acceptable condition levels, to provide transparency, establish a baseline to track progress, and communicate the need for improvements to ratepayers.
- Determining a target frequency for performing physical inspections for different types of assets, including underwater transmission pipes. (Although such an effort would be expensive, unplanned failures can also cause expensive reactive and unplanned replacements. PA recognizes that for some assets, it may make financial sense to limit inspections and/or run to failure).
- Continuing to develop the capability to use predictive maintenance based on maintenance work order histories to identify needs. Although there is some reported use of this capability, use could be expanded and integrated into planning in a more comprehensive manner.

#### Estimated Benefits

PA has not quantified specific benefits of improved prioritization. However, we believe that improved prioritization has the potential to increase the effectiveness of capital investment dollars. Improved prioritization ensures that the total impact of deferred investment is minimized. Currently, SAWS experiences costs due to deferred maintenance in the form of emergency capital projects, increased maintenance spending, and potential impacts on customer satisfaction and regulatory actions. Emergency capital projects are costlier than similar investments completed in a planned manner. By prioritizing projects that have the greatest leverage on overall organizational performance and long term costs, the total impact of deferred projects is reduced, ultimately freeing up resources to correct more problems before they become emergencies.

- PA has also not quantified the cost of implementing a formal Asset Management program as the costs can vary significantly based on desired functionality and business strategy. PA recommends that SAWS consider the business case for Asset Management implementation, especially in light of the ongoing Sanitary Sewer Overflow (SSO) initiatives.

## 5.8 Implementation Costs

Based on interviews with the Information Systems Department at SAWS, PA understands that a CPMS could be implemented for approximately $800,000 in software costs, and an additional $400,000 for internal labor costs, totaling $1.2 million[79].

## 5.9 Net Present Value (NPV) Calculation

PA calculated the NPV to be approximately $1.54 million based on the following assumptions:

- Cost of Capital: 5%[80]
- Annual O&M Benefits Anticipated: $589,000
- One-Time Investment Costs: $1.2 million to be implemented in 2014
- Steady State Target: January 1, 2015

[79] Information from SAWS

[80] Information from SAWS

- Timeline: 5 Years (January 1, 2015 to December 31, 2019).
- Inflation rate: 2.5%.

# OPERATIONS

# CONTENTS

# 6 OPERATIONS

## Overview

As the largest group within the utility, Operations ensures that SAWS customers receive uninterrupted, quality, potable water, wastewater, and associated heating and cooling services. An overview of the SAWS system is provided in a separate chapter in this document. As PA has defined and analyzed it, the Operations Group is comprised of the following major functions:

- Production and Treatment (P&T) manages the 24-hour-a-day operation of the system overseeing the operation, maintenance, and repair of facilities and equipment involved in the production and pumping of potable water, the production and operation of the water recycling facilities the mechanical and biological treatment and disinfection of wastewater, and the processing of wastewater biosolids for ultimate disposal.
- Distribution and Collection (D&C) operates, maintains, and repairs the approximately 10,000 miles of pipelines for the potable water distribution and wastewater collection systems.
- The Operations Services Group provides essential support services to D&C and P&T.

P&T and D&C represent core functions, while the Operations Services Group represents support functions. A core function is defined as that activity that includes major infrastructure investment (capital) and maintenance which are funded by rates approved by City Council. A support function is defined as that activity that assists with performing core activities and in some cases may have fees associated with them.

## Overall Observations

- PA's evaluation of this area focused on the ability of the Production and Treatment, Distribution and Collection, and Operations Services Group to effectively manage the SAWS water and wastewater system. We analyzed labor and non-labor practices, use of technology, compliance with rules, and key performance statistics and trends and found that they were consistent with industry practices.
- With a total permanent staffing of 785 FTEs, we find that SAWS' Operations, is properly structured and effectively staffed. Operations has done a good job of successfully integrating former BMWD personnel and infrastructure as a result of the end-to-end oversight and hands-on leadership provided by the Chief Operating Officer. While SAWS improves non-revenue water losses, we find that there is additional work that can be done that would minimize water losses and potentially increase water revenues and/or decrease operational costs.

## Areas of Excellence

- *Clear oversight of end-to-end operations*: SAWS' Chief Operating Officer oversees all operational and support processes, ensuring clear management oversight and responsibility. On the technology side, this overall oversight is also enabled by a state of the art control center that combines the emergency operations function and operational SCADA functions in a single room.
- *Good personnel and infrastructure integration with BexarMet*: SAWS has done well in combining systems with the former BMWD and removing extraneous facilities in a relatively short period of time. In addition to infrastructure consolidation, SAWS has also integrated many of the BMWD staff into its operations and is working to improve productivity.
- *Demonstrates innovation outside core business*: SAWS has several innovative programs in place such as Aquifer Storage and Recovery and water and solids recycling. SAWS also participates in digester gas sales and in a Demand Side Management plan.

## Areas of Potential Improvement

- *Managing non-labor spending:* Energy and chemicals spending are a significant portion of water and wastewater utility's annual operations and maintenance expenditures. While SAWS has negotiated an excellent electricity tariff and is doing well with respect to energy consumption benchmark data relative to other water and wastewater utilities, it can the use of more efficient equipment. SAWS should also reduce chemical spending and evaluate the use of new technology for sludge management that would have a long-term financial benefit.
- *Managing Non-Revenue Water (NRW) losses:* NRW is classified as water that has been placed into the distribution system, but it is not generating revenue because it is either not being metered, or it is authorized use which is not being billed or metered. NRW is calculating by subtracting the amount of authorized consumption from the amount of water supplied and then adding in the amount of unbilled metered water and unbilled unmetered water. NRW is a larger amount than general water loss because it includes authorized uses that are unbilled. While SAWS is taking steps to manage nonrevenue water losses, we find that there is additional work that can be done that would minimize water losses and potentially increase water revenues and/or decrease operational costs.
- *Automated Metering Infrastructure:* PA understands that CPSE is currently implementing an Automated Metering Infrastructure program for its electric and gas customers, partnering with Silver Springs Network. CPSE has invited SAWS to participate with them as a fast follower in implementing their solution with potential savings to SAWS from sharing infrastructure and applications. This opportunity should be further investigated to determine whether there is a business case to replace manual meter reading with this technology especially as it pertains to reducing NRW losses.

## Recommendations and Expected Financial Benefits

PA recommends implementing a combination of management consolidation recommendations and process improvements. Of these recommendations, PA was able to quantify an expected $1.2 to $3 million in annual efficiency gains and cost savings, which are listed in Table 16 below. In addition to the listed recommendations, our professional experience has shown that improvements in energy management and non-revenue water management will also yield cost savings, but which are harder to quantify and will require a more focused analysis which SAWS is currently undertaking.

**Table 16: Recommendations and expected savings**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Consolidate all water quality functions under single management | Positions | $156,000 due to organization management consolidation |
| 2. | Improve productivity in electrical maintenance area | Process | $216,000 due to increased productivity through process improvements and permanent eliminations of vacancies |
| 3 | Reduce ferrous sulfate usage | Process | $320,000 due to reduction in quantity of chemical used |
| 4 | Implementing a valve exercising program | Process | $2.3 million (assumed to be achieved incrementally at a growth of 20% or $460,000 each year between 2015 and 2019 reaching $2.3 million in 2019) |
| 5 | Implement 24-hour working supervision of the Emergency Operations Center (EOC) and SCADA controls area | Process | $100,000 in productivity improvements |
| | **Total savings** | | **$1,252,000** in annual O&M costs*** |

- **$1,252,000 includes the first year of savings through valve exercising program. As this is expected to grow each year to reach $2.3 million in Year 5, annual savings in Year 5 are calculated to be approximately $3 million.

* NPV is calculated to be approximately $9.5 million under the following assumptions

  – Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
  – Investments of $500,000 for a valve exercising program.
  – Benefits accrued between January 1, 2015 and December 31, 2019.
  – Discount rate of 5%.
  – Inflation rate of 2.5%.

# Introduction

The Operations Groups ensure that SAWS customers receive uninterrupted, quality, potable water, wastewater, and heating and cooling services. An overview of the SAWS system is provided in a separate chapter in this document.

## 6.1 Overview of SAWS Operations

SAWS Operations accounts for the most number of employees out of all other Groups at SAWS. SAWS Operations includes core functions and support functions. A core function is defined as an activity that includes major infrastructure investment (capital) and maintenance which are funded by rates approved by City Council. A support function is defined as that activity that assists with performing core activities and in some cases may have fees associated with them.

These core, support, and other functions are summarized below:

Production and Treatment: Production Operations manages, controls, and operates the production of potable water for SAWS' customers. Treatment Operations oversees all the operations of the water recycling centers for the system as well as biosolids disposal to meet federal regulations. Treatment Maintenance manages all the electrical, instrumentation, and mechanical and recycle maintenance of SAWS' water recycling centers.

Distribution and Collection (D&C): SAWS Distribution and Collection crews are mobilized from six strategically located service centers throughout the city: Eastside, Mission Road (south central), Northeast and Northwest. Medio Creek and Dos Rios have recently been added as part of the integration of the DSP infrastructure. D&C provides the following services:

- Emergency Response: Provides critical support to SAWS customers and crews 24/7.
- Preventative Maintenance Programs – Ensures the integrity of water and wastewater infrastructure.
- Construction Crews – Offers in-house construction expertise, including asphalt and concrete services, to improve service restoration and increase customer satisfaction.
- Sewer Televising Programs – Equips management to make informed decisions while helping protect the quality of the Edwards Aquifer.
- Sewer Line Cleaning – Reduces potential for back-ups due to debris and grease.
- Leak Detection Program – Ensures water leaks are identified, reducing water loss.

Operations Services Group: The Operations Services Group provides the following types of services that are considered support functions:

- Environmental Services – supports engineering services, handles regulatory permitting, and manages external contracts. Also manages the Emergency Operations center.
- Maintenance Planning – The Maintenance Planning Department oversees work order data, plans maintenance schedules, and provides overall data management and reporting pertaining to field and plant operations. In addition, the department is responsible for performing predictive maintenance and failure analysis on identified critical equipment for these systems.
- Sewer System Improvements (SSI) – This is a program of capital investments and operating requirements that will help the system meet the endorsed levels of service goals for regulatory permit compliance, system reliability and functionality, and sustainable operations of the sewer system. SSI capital investments include the rehabilitation of sewer pipelines and manholes that contribute to Sanitary Sewer Overflows (SSOs) due to compromised maintenance or structural conditions. SSI operating requirements include expanding the efforts to televise sewer lines throughout the system and identify and improve the structural integrity of the system.

Heating and Cooling: Heating and Cooling is considered as another function, as it is not core to the principal business that SAWS is engaged in, which is water and wastewater management. However, since it is a revenue-producing activity and is recognized as one of the four business segments that SAWS operates, PA is analyzing this Department in the category of other. With a budget of $7.8 Million and 18 full time employees, Heating and Cooling operates 24/7, providing the downtown business district and Port San Antonio with chilled water and/or steam services. The department is currently responsible for multiple plants and the distribution systems providing service to 21 downtown chilled water customers (i.e., Marriot, Hilton, Alamodome), 11 downtown steam customers (i.e., Grand Hyatt, Convention Center, Federal Courthouse) and 5 Port San Antonio customers (i.e., Port San Antonio, Boeing Corp., and Lockheed-Martin). The department is currently transitioning out of the steam business.

## 6.2 Evaluative Criteria Employed

In evaluating the effectiveness and efficiency of the current state of the Operations function, we analyzed the following:

- Infrastructure Assessment: Site visits and tours of key operations facilities.
- Metrics Benchmarking: Evaluation of key P&T and D&C performance metrics.
- Organization: Evaluation of the general organization of the function and span of control.
- Technology: Utilization of technology in this area.
- Strategy/Policy: Evaluation of strategies and policies from an efficiency perspective.

## 6.3 Infrastructure Assessment

To develop a comprehensive understanding of the system and its operation, PA analyzed operational statistics, conducted individual and group interviews, and toured the following sites:

- Edwards Aquifer recharge zone – two locations.
- Mission Pumping Station.
- Dos Rios wastewater treatment plant.
- Twin Oaks Aquifer Storage and Recovery Facility.

Site visits included informal discussions with SAWS. Observations detailed below, by facility, are a result of both our independent assessment as well as information provided during the site visit.

- Edwards Aquifer Recharge Zone – Two cave areas were visited to better visualize how rainfall is captured to recharge the Edwards Aquifer. Both crevasses exhibited how the aquifer can be recharged naturally, and emphasized the importance of protecting and maintaining their existence and function.
- Mission Pumping Station – This pumping station retrieves water from the Edwards Aquifer, chlorinates the water, and pumps the water directly into the system. The operation of the station system is almost fully automatic with the exception of disconnecting and reconnecting the 1 ton chlorine tanks. This automation allows the system to be operated offsite, requiring no fulltime staff to be present as part of its operation. The pumping station is in the process of shifting its chlorination system to a more secure onsite generation of sodium hypochlorite to be used for disinfection of the water.
- Dos Rios Water Recycling Center (WRC) – Placed in service in 1987, the Dos Rios WRC is located in a fairly remote area, spread out over a large number of acres. The Dos Rios WRC utilizes activated sludge treatment and handles approximately 125MGD of the SAWS sanitary sewer flow, making it the largest WRC at SAWS. While touring the plant, it was noted that the Grit Chamber was under construction. SAWS has applied to have the plant capacity raised from the current rating of 125MGD. The rationale is that the plant is currently capable of increasing flow significantly and still treating the wastewater within permit limits. Additional capacity is also being considered as the two equally-sized

treatment trains of the secondary treatment are currently running at 50% capacity. With all other components of the WRC having the apparent hydraulic capacity of somewhere over 200MGD, it is anticipated that if the two secondary treatment trains were reconfigured to parallel versus the current series configuration, additional capacity could be realized as a result. As blowers often represent the largest portion of the power consumption at a WRC, this area was reviewed onsite. Currently, there are three 3,000 horsepower (hp) blowers and two 1,500 hp blowers, none with variable frequency drives (VFD). It is estimated that the plant would ultimately get re-rated to 217MGD by the year 2024.

- Twin Oaks Aquifer Storage Recovery Facility (ASR) – This facility houses storage, treatment and major system pumping for SAWS, with the surrounding acreage purchased to utilize for injection and recovery well locations and leased back to the local farmers for raising livestock. It appears that the Carrizo Aquifer has excess storage capacity that enables water to be injected via a series of injection wells into the aquifer during periods when water is more plentiful than needed in the Edwards Aquifer, creating Edwards Aquifer storage zones in the Carrizo Aquifer. During periods of drought-related Edwards Aquifer water rights restrictions, the stored Edwards Aquifer water is then pumped back out of the Carrizo Aquifer. The major conveyance pipe system between the ASR and the potable water distribution system currently allows the water to be pumped in one direction at any given time, as there is only one pipe to move water from San Antonio to storage at the ASR, or to move stored ASR water back into San Antonio. When the new conveyance pipe comes online, the facility will be able to pump in both directions simultaneously if needed. As the water in the Carrizo Aquifer contains some iron and sulfur, this is used as an indicator to determine if an Edwards Aquifer storage zone has been depleted and the well is recovering local Carrizo Aquifer water.
- Lab Facilities - The lab facilities are located at the Dos Rios WRC and act as a centralized facility providing testing for all SAWS operations. During the Dos Rios tour it was mentioned that SAWS was in the process of integrating the former BMWD permits with SAWS to reduce the amount of testing required and the associated costs.
- Water system – SAWS has many different surface and groundwater sources to merge and manage, which is rare for a water utility, making SAWS one of the more complicated systems to operate in the US.
  - Summer *Main Break Season* was a term offered during the interviews. This is a season where historically an abnormal number of water main breaks have occurred due to the hot weather causing differential ground shifting. The SAWS maintenance staff have recognized this yearly seasonal event and plan accordingly, pre-ordering anticipated materials in advance of the season.
- Collection system –One notable feature is that almost all of the original large diameter pipe network was built utilizing concrete pipe materials that are subject to corrosion and tend to be more brittle in settling ground conditions. Due to this condition, asset management becomes even more imperative.
- Sanitary Sewer Overflows (SSO) – SSOs can be a result of grease and debris within the system, broken sewers, excessive infiltration, or undersized infrastructure. As SAWS is operating under an EPA Consent Decree, there is an additional legal obligation to reduce SSOs from the system, which provides greater incentive to forensically examine the most appropriate solutions for reducing the SSOs from the system.
- Storage – While SAWS does have the usual type of storage (elevated and above ground) as is required by regulation, their storage is not relegated to the typical tank scenario, as SAWS takes advantage of the available aquifers. This avoids some of the cost and maintenance of standalone storage, but is offset by the cost of conveyance (back and forth) and monitoring.

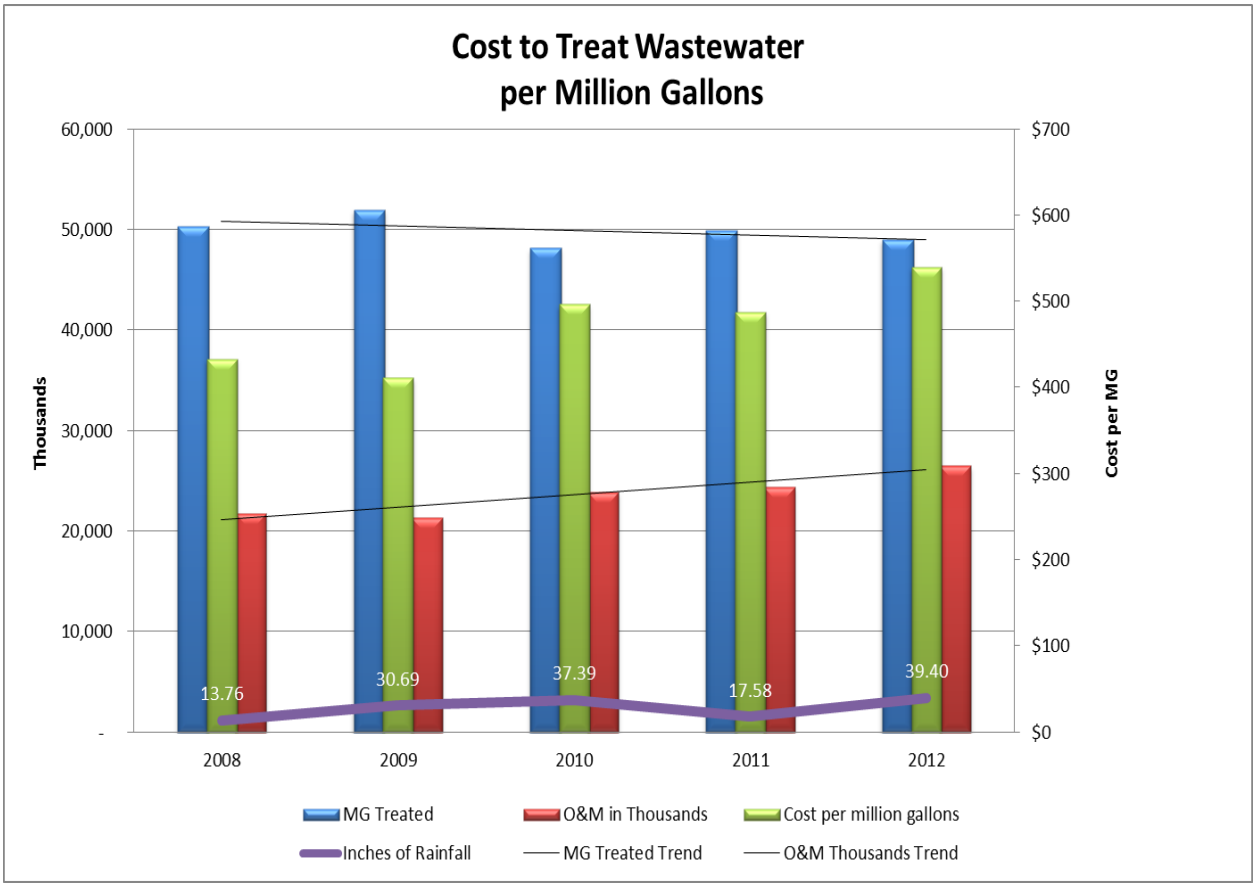
## 6.4 Metrics Benchmarking

Cost Performance: PA analyzed two fundamental metrics to evaluate P&T and D&C cost performance trends which are discussed below.

### 6.4.1 Costs to Treat Wastewater per Million Gallons:

Figure 16 below shows the trend in treatment costs per million gallons for the previous six years:

**Figure 16: Costs to treat wastewater per million gallons**




As shown, the cost to treat wastewater (per MG) has risen slightly over a five year period. This can be attributed to the following drivers:

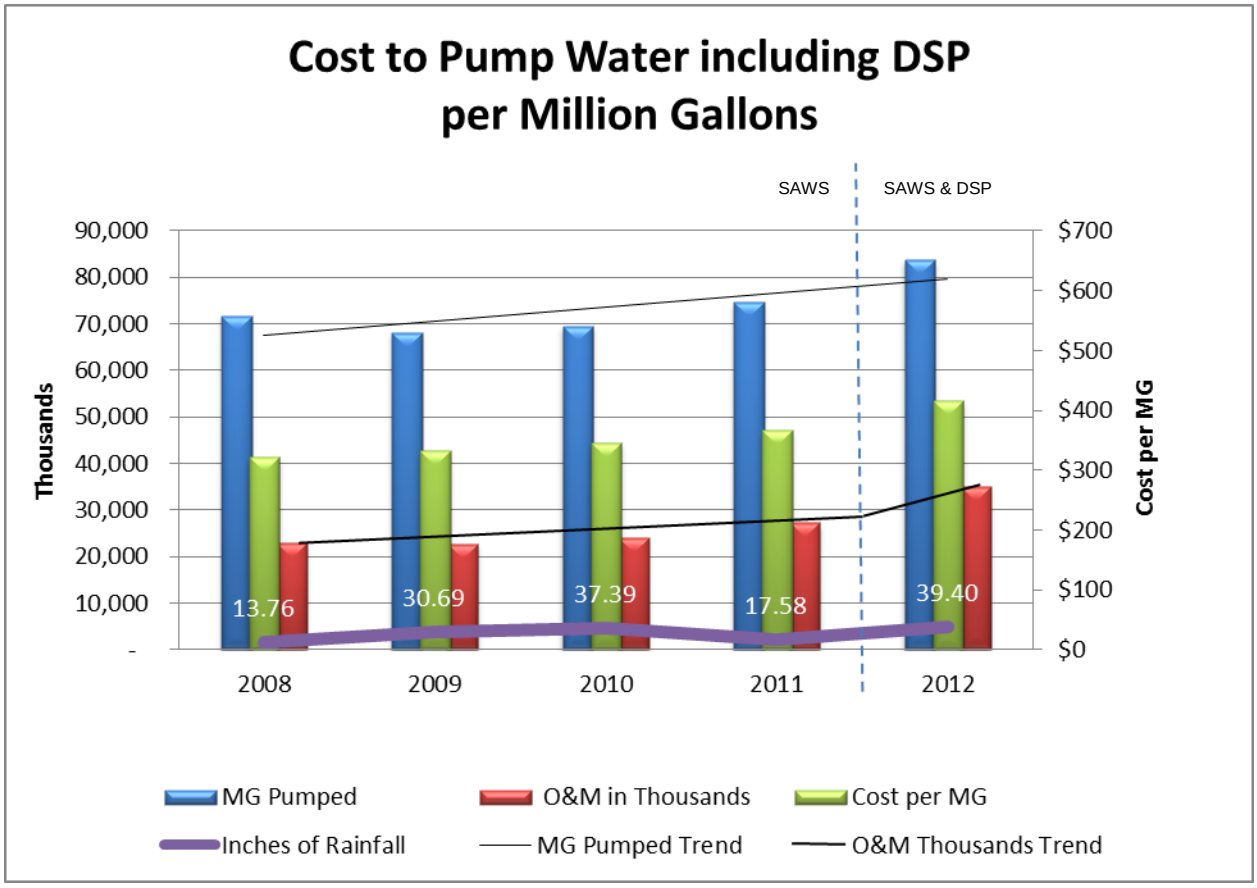
- Composting of biosolids has been the most beneficial and cost-effective method of disposal. Approximately 50% of biosolids were composted at a price of $13.02/ton during this period, with the remainder being sent to landfill. Landfill costs have risen steadily from $16.94 in 2008 to the current price of $27.00 per ton.
- Cost of the dewatering chemical (polymer) increased during this time as well.
- Treatment Operations utility costs remain fairly stable, hovering around the $5 million mark during the five year period.
- In 2010, SAWS identified additional SAWS wastewater customers being served by Cibolo Creek Municipal Authority, resulting in an annual increase of approximately $232,000. TCEQ wastewater permit fees nearly tripled during the same year.

- A hard freeze in early 2011 lasting several days required substantial investment in repair of instruments and equipment.
- High overtime was incurred while stabilizing the treatment process at Leon Creek WRC and Dos Rios WRC.
- In 2012, unexpected repair of the strain press of approximately $250,000 and chlorine scrubber system at Dos Rios totaled $225,000.

### 6.4.2 Costs to Pump Water per Million Gallons:

Figure 17 below shows the trend in pumping costs per million gallons for the previous six years.

**Figure 17: Cost to pump water per million gallons**




The cost per MG pumped increased from 2008 to 2012 due to several factors. During 2009 and 2010, chemical costs increased significantly for most of the high volume treatment chemicals used by SAWS. Utility costs have fluctuated during this period from a low of $10.9 million in a year with no recovery of stored water from the ASR facility to a high of $13.3 million due to the energy costs to withdraw water from storage, treat it, and pump it to San Antonio. In 2012, DSP utility expenses were $3.2 million, bringing the total Production cost to a high of $14.97million. TCEQ permit fees rose from $376K in 2009 to $1.08 million in 2010, and continue to increase by a small percentage each year. The United Water contract for treatment of surface water from Medina Lake in 2012 was $2.249 million.

#### Employee Efficiency

PA analyzed two fundamental metrics to evaluate P&T and D&C employee efficiency trends – MG Treated Wastewater per FTE and MG Pumped Water per FTE. In both instances, the productivity per

FTE has steadily risen over the past five years, as shown in Figure 18 and Figure 19 below, which is indicative of improving productivity.

**Figure 18: Million gallons wastewater treated per employee**

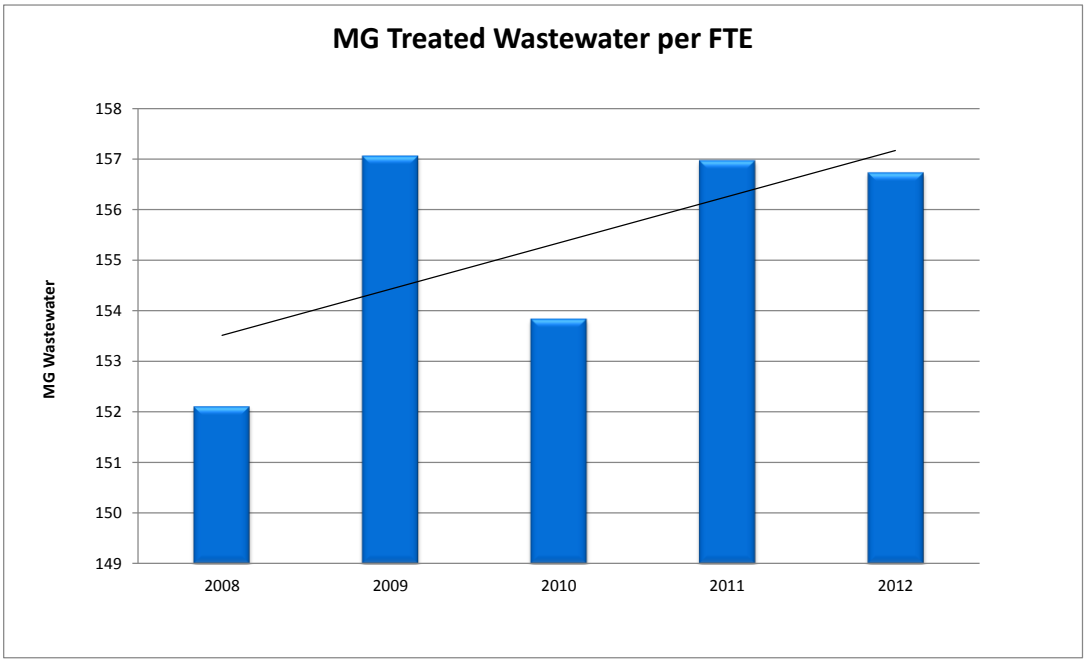
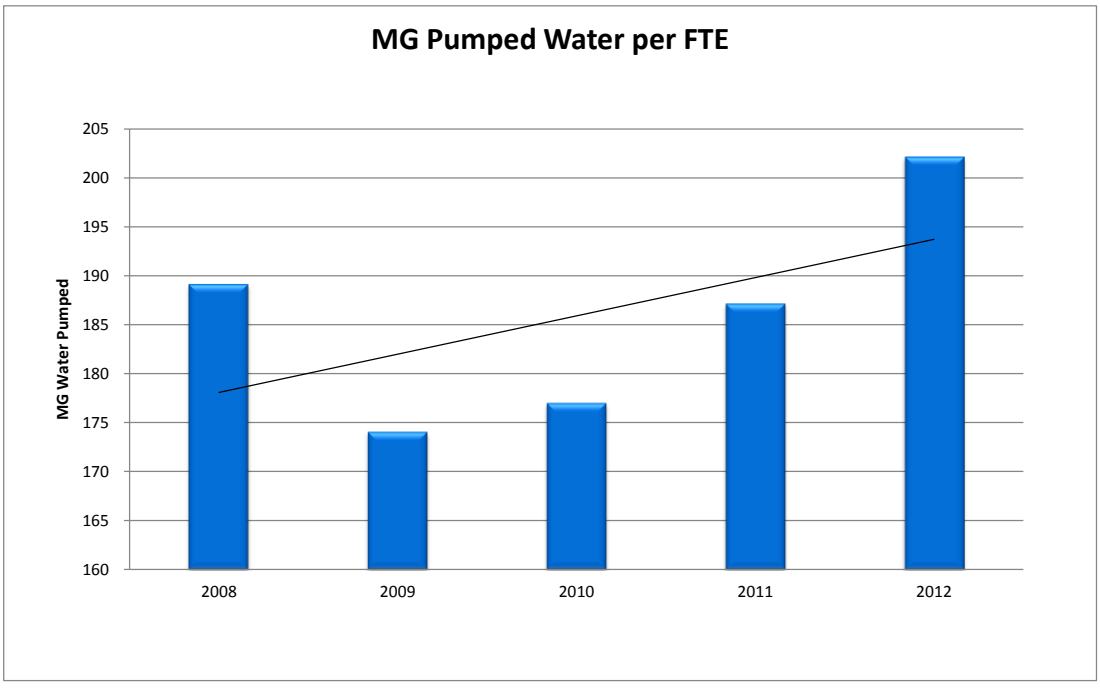



**Figure 19: Million gallons water pumped per employee**

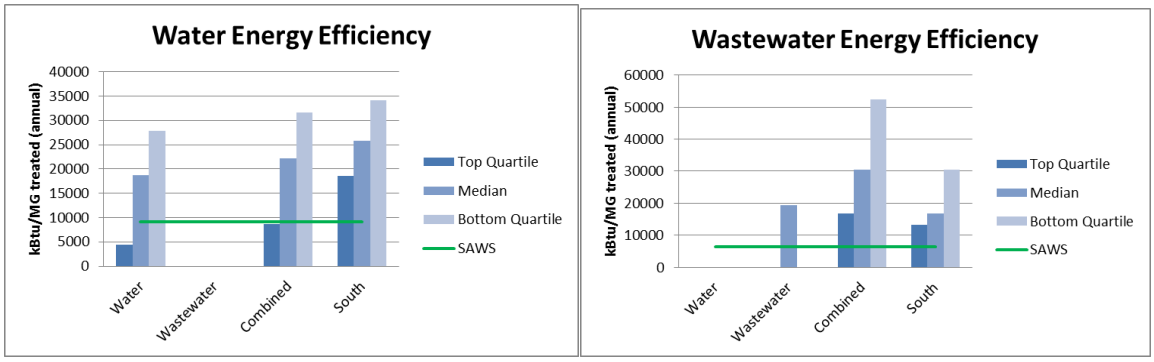


## 6.4.3 Energy Usage

In 2012, SAWS consumed 336,696,123 kWh at a total cost of $25,532,336. SAWS has four tiers of tariff structures negotiated with its electricity provider CPS Energy (CPSE). SAWS' four tariff structures range from 6.6 cents/kWh to 8.4 cents/kWh with the cost of energy ranging from 2.6 cents/kWh to 6.9 cents/kWh. This is a competitive per unit cost of electricity.

In order to evaluate SAWS' energy consumption efficiency, we compared the company's values for water and wastewater to AWWA quartile benchmarks.

**Figure 20: Values for water and wastewater to AWWA quartile benchmarks.**




PA's analysis shows that SAWS is currently in the top quartile of AWWA's benchmarks for energy efficiency.

Though SAWS enjoys a competitive tariff arrangement, further reduction in total energy cost is possible if SAWS decreases its energy consumption volume, especially during peak periods. SAWS is currently looking into reducing energy consumption through replacing inefficient equipment that is near the end of its useful life with more efficient motors.

SAWS has been engaged in a Demand Side Energy Management (DSM) program for the last four years during which CPSE has paid approximately $900,000 to SAWS. On an annual basis, approximately $300,000 is credited back to the various departments within SAWS based upon their contribution to the program. The term of the DSM program is from June through September of each year and requires that CPSE notify SAWS two hours prior to an event, with the event window being from 1pm to 7pm only on weekdays for no more than 3 hours. The maximum number of events is 25 per year and the total maximum hours are 75. SAWS is compensated at a rate of $67/kW when it participates. SAWS has averaged 3,500 kW in nominations.

It was noted that emergency power is not provided to the treatment plant sites to enable them to run without utility power for small periods of time. When power is not available from the provider, operations are required to divert flow until power is restored, eventually diverting untreated wastewater to the outfall if power is not restored within a certain amount of time. Any stored wastewater during a power outage must be managed carefully such as not to upset the treatment process of the plant when introducing the stored wastewater back into the plant flow. If wastewater is not treated sufficiently, there are costs and fines associated with each occurrence. Only Medio WRC is able to run under emergency power. The 2 MW genset can support the whole plant.

## 6.4.4 Chemicals Usage

In 2012, SAWS spent $6,591,321 in chemicals, with ferrous sulfate purchased in the largest quantity (accounting for a little less than half of total chemical costs).

- Ferrous sulfate is introduced into the collection system to abate foul odors that local residents have reported. When the program was initiated, there were minimal locations and it initially cost $600,000 per year in 2000. Current costs for the program are slightly over $3 million annually, as shown in Table 17 below. The reason for the steady increase in costs is not due to the cost of the commodity, which has generally stayed constant; rather, it is due to an increase in the quantity of chemical utilized.

**Table 17: Chemical utilization**

| | 2010 | | 2011 | | 2012* | |
|---|---|---|---|---|---|---|
| | Volume | Average Price | Volume | Average Price | Volume | Average Price |
| Polymer/Lb | 721,008 | $ 0.87 | 962,585 | $ 0.88 | 991,068 | $ 0.88 |
| | | | | | | |
| Ferrous Sulfate/Gal | 4,760,059 | $ 0.52 | 5,840,104 | $ 0.48 | 6,397,507 | $ 0.48 |
| | | | | | | |
| Chlorine/Ton | 1,915 | $ 519.80 | 1,052 | $ 519.80 | 1,724 | $ 519.80 |
| Chlorine/150 Lb CyL | 744 | $ 76.35 | 1,082 | $ 76.35 | 1,185 | $ 76.35 |
| | | | | | | |
| Fluoride/Gal | 62,719 | $ 4.50 | 73,478 | $ 4.54 | 92,048 | $ 4.54 |
| | | | | | | |
| Sulfer Dioxide/Ton | 664 | $ 620.00 | 618 | $ 620.00 | 553 | $ 688.70 |

*Includes DSP usage

| | 2010 | 2011 | 2012 |
|---|---|---|---|
| Total cost of all chemicals used | $ 5,674,533.00 | $ 6,359,491.00 | $ 6,591,321.00 |

- None of the ferrous sulfate injection locations are flow regulated. Ferrous sulfate is injected in the same amounts whether the flow is minimal (which is normally when there is the greatest opportunity for foul odors), or when flow is at a maximum (such as during a large rain event, which would not normally have a lot of odor). The use of this chemical is not a permit requirement or a requirement of the waste water treatment processes.
- Along with polymers, the volume of ferrous sulfate used has grown consistently and at a significantly higher rate compared with other chemicals utilized over the past three years. However, the unit rate that SAWS has paid for ferrous sulfate as well as other chemicals has been relatively stable.

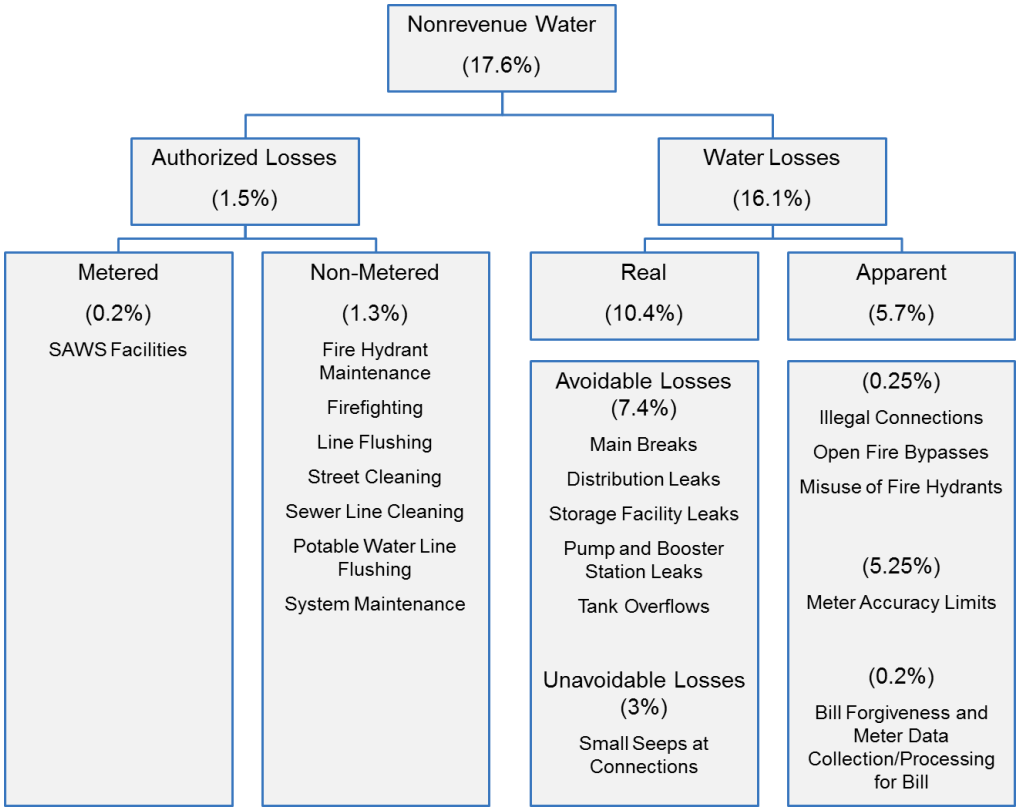
### 6.4.5 Non-Revenue Water (NRW)

Non-Revenue Water Loss represented approximately 17.6% of total usage in 2012 for SAWS.[81] This can be broken down into Authorized Loss and Water Loss. Authorized Losses represent valid uses of water for which there is no revenue collected, such as fire-fighting and line flushing. The 2012 estimate of these losses placed Authorized Losses at 1.5%of total production.[82] A significant reduction of these uses is likely limited, but it is important to continue tracking these volumes. The remaining Water Loss volumes represent 16.1% of total 2012 production. These losses can further be separated between Real Losses (water that did not remain in the pipes) and Apparent Loss (a combination of water delivered to customers but not paid for in full, meter errors, billing errors, and other factors). The annual audit process helps to estimate between Real and Apparent Losses in order to better identify opportunities for improvement as shown in Figure 21 below:

[81] SAWS provided information

[82] SAWS provided information

**Figure 21: Breakdown of Non-Revenue Water loss**




*Source: Data provided by SAWS*

In 2010, Texas utilities reported an average of 16.7% water loss to the Texas Water Development Board (TWDB). In the past three years, SAWS water loss percentages have been increasing (2010 – 11%, 2011 – 14%, 2012 – 16.1%). Of these three years, two were hot and dry and one was considered wet. When the soils in significant portions of the SAWS service area shift rapidly between extremely dry and extremely wet conditions, significant strain is exerted on the pipes, leading to more main breaks and leaks.

## 6.5 Overall Organization

SAWS has combined the core Production and Treatment, Distribution and Collection operations, SSO response, and Operations Support functions under one Senior Vice President who has eight direct reports and serves as the Chief Operating Officer. This organization structure makes sense given the responsibilities.

- Production and Treatment - We calculated the span of control to be 1:7.5 or approximately 7–8 employees per supervisor which is a very good span of control for P&T. The function has 6 levels and is organized in a logical manner. There are a small number of supervisors with 3 or fewer direct reports. In the four instances where a Manager was overseeing only 2 employees, very clear explanations were provided with respect to their roles, which were defined as working supervisors.
- Distribution and Collection - We calculated the span of control to be 1:4.48 or approximately 5 employees per supervisor, which is an acceptable span of control for D&C. The function has 6 levels and is organized in a logical manner. There were 26 supervisors each with 2 employees under supervision. Our understanding is that the merger process with DSP continues within the D&C function and span of control should adjust as full and final employee integration occurs.

- There appears to be redundancy in the regulatory and water quality functions between several departments (Production and Treatment, Operations Administration, Water Resources). Although each of the job duties are slightly different, all of the individuals performing this function could be managed by one Director.
- There are 26 supervisors with 2 employees under their direction. The supervisors in these instances are in charge of their truck and crew. Increasing the span of control in this group is limited by the number of employees associated with each work crew.

## 6.6 Use of Technology

SAWS strives to aggressively evaluate and implement new technologies that can minimize operational costs, improve services to the ratepayers, or protect the environment. Examples include the sale of digester gas (first of its type in the nation) or the solar farm agreement with CPSE (the largest operating solar system in Texas).

As has been previously documented, the overall system appears to be well automated. SAWS has well-established SCADA monitoring and control for the Production system. The computer monitoring and control for the Wastewater system is not as well-developed and the lift stations are about one third complete with automation upgrades. SAWS has begun using GPS in vehicles and needs to continue with this technology for specific functions on a business case basis only. The Emergency Operations Center has a good suite of technologies but needs to better utilize the Cisco phone system. On the D&C side, SAWS has established innovative and cost effective-processes with mobile work order systems and processes such as pipe patching or pipe bursting technologies.

## 6.7 Policy and Strategy

- SAWS policy and strategies for Operations involve outsourcing functions that can be provided more effectively by a contractor (such as large line cleaning, sewer flow monitoring, or sludge hauling and composting). SAWS will need to establish a strategy for operation of the currently idled Medina River Treatment facility and the planned groundwater desalination facility.
- In the area of NRW, SAWS has focused on several key policies and programs. Each is being reviewed for operational improvements as part of the water loss audit process.
- To stem Apparent Losses the following initiatives are in place:
  - Residential Meter Replacement Program: More than 80,000 residential meters replaced in the past three years with 34,000 more being replaced in 2013.
  - Residential Meter Testing Program: Residential meters are tested in one of three ways – (a) randomly before being placed in service, (b) randomly after they are removed from service, and (c) tested at the request of Customer Service personnel or by the resident.
  - Revenue Collections: Field investigators are assigned to examine reports of fraudulent use. In addition, a team of Customer Service staff has been assigned to analyze unusual meter reading patterns each month to identify sick meters that may be under-registering water use.
  - Large Meter Testing Program: Commercial meters three inches and larger are tested *in situ* using special equipment.
- In the area of Real Losses, SAWS has several efforts in place. While these have been active for many years, they are being reviewed in detail for operational improvements:
  - Leak Detection Surveys: The goal is to survey 20% of the distribution system each year for leaks. Several studies have been conducted with outside vendors to pilot automated leak logger technologies in the water distribution system.

- Main Break Line Locater: Leak detection survey teams are on call to pinpoint water main break sources in addition to their survey work.
- Storage Tank Overflows: If an overflow is known, current efforts include trying to use runtime on the pumps and approximate flow rate to determine the amount of tank losses.

## 6.8 Recommendations and Estimated Benefits

PA identified recommendations regarding infrastructure management, organization restructuring, business process, technology utilization improvement, and corporate policies.

### 6.8.1 Infrastructure Related Recommendations

#### Recommendations

- As is currently in progress, it is recommended that SAWS continue to combine systems with the former BMWD and remove all extraneous facilities. This effort will continue to reduce costs in several areas (energy, chemicals, laboratory testing, manpower etc.) and provide additional system redundancy, reducing the risk of failure within the system itself.
- SAWS would benefit from increasing the valve exercising program. When valves are not regularly exercised, the system suffers in several different ways. If a valve is not working, then the crew needs to go to another valve (sometimes 2 or more) to isolate the area where the service call is located. In addition to the inefficient use of time, the number of impacted customers may increase as the isolated area increases. Additional focus on this program would improve the ability to react in an emergency service call.

#### Estimated Benefits

We have quantified benefits related to each of the above areas as follows:

- Combining systems by looping the distribution piping will reduce the risk of failure in certain locations such as the City of Somerset, which is currently served by just one pipeline. Specific value associated with this type of system redundancy has not been quantified, although it is fair to acknowledge that there should be some improvement in reliability of the overall system due to this combination.
- Decommissioning certain facilities, which will bear a one-time cost, should result in ongoing savings due to reduced energy, chemical spending, and reduced labor costs (fewer daily site visits required) in maintaining those facilities. PA has not performed a cost-benefit analysis of all of SAWS' sites but recognizes that the consolidation of facilities should result in some financial benefits.
- Throughout 2013, approximately 1,600 true main break shutdowns are anticipated. If a valve exercising program is implemented, based on discussions with the SAWS leadership in Operations, it is possible to realize approximately $2.3 million in savings over a five year period as a result of labor savings and the value of lost water. The cost associated with implementing such a program is expected to be approximately $500,000. For quantification purposes, PA assumed that the $2.3 million would be achieved at a rate of 20% growth or $460,000 each year to ramp up to $2.3 million in 2019.

### 6.8.2 Organization Related Recommendations

#### Recommendations

- Combine the individuals currently performing water quality functions between several departments into a single department. There will be savings by managing with a single Director and there may also be some savings in the actual reduction in the number of FTEs currently performing these functions due to efficiencies from being managed and located together.

- Implement 24-hour working supervision of the Emergency Operations Center (EOC) and SCADA controls area for clear decision authority in these areas on an around the clock basis. This recommendation will not result in additional headcount. The savings are difficult to quantify; however, there will be service level and employee performance improvements opportunities.
- Review of the integration of the former BMWD to ensure that employees have been placed correctly and are fully productive.

### Estimated Benefits

- Consolidation of water quality functions is anticipated to result in $156,000 in savings through the elimination of duplicative management and administrative responsibilities as well as elimination of certain staff due to increased efficiencies. From a timing perspective, it is assumed that these proposed labor reductions would be managed in a non-disruptive manner over an 18-month period.
- EOC and Control center management savings value is estimated to be approximately $100,000 due to optimized management efficiencies.
- Two electrical positions were eliminated in P&T as a result of centralization of the electrical maintenance function across several departments. A shift in operational procedure at Twin Oaks ASR allowed the reduction of one full-time operator position.

## 6.8.3 Reduce Non-revenue Apparent and Real Water Losses

### Recommendations

PA understands that SAWS will be setting five-year targets for reducing water losses in early 2014. These targets will be driven by the results of an independent, external assessment of audits completed during the past three years and the water loss initiatives in place. SAWS staff are also engaged in a peer review process to compare and contrast SAWS' NRW management efforts to those of other utilities. As part of the water loss planning, program options for reducing water loss will each be assessed for likelihood of success and return on investment. Provided below are a few recommendations, which have not been quantified at this time, for SAWS to consider.

- *Improve accuracy of large meters:* Large meters comprise of 1.75% of all meters but account for 35% of water sold by volume. The relative importance of each of these meters to revenue capture makes them a logical target for improvement in Apparent losses. SAWS' practice of conducting regular field testing of large meters is a good practice that is not performed by all large utilities. Additional efforts to improve revenue from large meters might require upgrading meters to newer technology or changing meter sizes to eliminate over-sized meters that are less capable of reading low flows of water. These options need to be explored against the significant investment associated with them. Careful analysis of variables associated with each large meter location is necessary to determine the potential for return on investment.
- *Evaluate new technologies:* Investigate pilot projects utilizing new technologies that identify leaking pipes, as they contribute to line losses across the SAWS water distribution network. Since a reduction in Real water losses impacts water supply planning, it will be important to understand whether any investment in new technology will in fact *materially* impact the costs associated with water supply projects.
- *Automated Metering Infrastructure (Also covered in the Customer Service Section):* PA understands that CPSE is currently implementing an Automated Metering Infrastructure program for its Electric and Gas Customers, partnering with Silver Springs Network. CPSE has invited SAWS to participate with them as a fast follower in implementing their solution with potential savings to SAWS from sharing infrastructure and applications. This opportunity should be further investigated to determine whether there is a business case to replace manual meter reading with this technology. SAWS should

investigate the business case feasibility of AMR or van drive-by options. Possible benefits from the collection of hourly or daily interval data include the following:

- automated leak detection (water loss),
- communication of usage patterns to enhance conservation as well as influence and enforcing conservation objectives, and
- understanding state of meter health.

### Estimated Benefits

- PA has not quantified the value of reducing Apparent and Real water loss. A determination of precise savings estimate is difficult without undertaking a more detailed business case analysis and evaluation, including an analysis of specific investment required which is beyond the scope of this study. Detailed below is an explanation of what makes the computation difficult and the type of data and the kind of analysis required to make a more accurate prediction of likely savings in both cases.
- *Improvements (reductions) in Real water loss:* This would make it possible to defer the timing of new water supplies needed as existing supply is capable of meeting projected customer needs. The precise value attributed to this is difficult to quantify, but can be estimated as the amount of water which might not need to be withdrawn from storage in the ASR, or deferring the need for some other water project.
- *Improvements (reductions) in Apparent water loss:* Results in SAWS collecting additional revenue on water used but which was not previously properly registered and billed due to metering anomalies. The value of apparent losses can be calculated by taking into consideration both water consumed as well as sewer charges, as they are both determined by metered usage. The complication around estimating the precise value is associated with the investment required and determining if the expected net benefit will be positive. While new meters can be more accurate than aging meters, there will be limits on their projected accuracy. Also, as meters, especially large ones, are expensive, it will be necessary to estimate the anticipated water gallons potentially saved on a case-by-case basis to determine if the revenue gained from the additional gallons being metered will offset the cost of investment in new meters.

## 6.8.4 Process Related Recommendations

### Recommendations

- As the use of ferrous sulfate is strictly for odor-related problems, and while it is an important civic consideration, this area offers potential for some savings. At one extreme, if it were palatable to ignore all odor complaints due to abandoning this program, the entire $3.06M could be saved from the budget. Understanding this is not consistent with SAWS policies, the program should be reviewed to determine to what level it can be reduced.
- New technology for sludge program – SAWS is currently evaluating new technology for the treatment of wastewater sludge. While this technology has a very high capital cost initially, in other locations it has reduced sludge quantities by 50%, improved sludge quality, and increased gas production. This process is called thermal hydrolysis. It has the potential to significantly reduce or even eliminate SAWS sludge disposal costs. There are no systems of this type in operation in the United States.

### Estimated Benefits

PA has quantified benefits related to each of the above areas as follows:

- The realistic reduction of ferrous sulfate is estimated between 3% and 17%. A full research and analysis of the ferrous sulfate injection program would be required to detail what level of reductions are possible. If SAWS were to monitor wet weather events and reduce pumping of ferrous sulfate into the

system during such occurrences, it would be fairly easy to achieve a reduction in chemical usage. During wet weather events, wastewater is diluted, and customers are less likely to be outdoors. We estimate this to yield from 3% (for an assumed 11 rain events) to a much higher value depending on the number of rain events in a given year. A 3% reduction estimate represents a minimum savings of approximately $96,000 per year. On the higher end, a 17% estimate is based upon hand regulating the chemical flow into the system and manually adjusting the injection of ferrous sulfate into wastewater flow of the collection system. The reduced level of use of ferrous sulfate ($544,000) would pay for the manpower required to achieve the reduction goal. Based on discussions with SAWS leadership, PA has assumed a savings of approximately 10% or $320,000 in this area as a result of examining better practices to use this chemical. If the chemicals were introduced into the collection system using a flow monitoring system with an automatic flow regulator, additional chemical usage could be saved. This chemical savings and the possibility of reducing the amount of chemical in general should be investigated to determine both the merit and resulting cost savings. The most practical test for this case would be to purchase and install one flow regulated system to use as a full scale pilot to determine the ultimate value.

- Value of sludge thermal hydrolysis technologies – SAWS current sludge hauling and disposal programs are conducted by contractors. Approximately 50% of total sludge produced is composted and the remainder is disposed of in landfills. These programs cost $3.2 million annually, and have recently seen price increases with more price increases anticipated for the future. If thermal hydrolysis is evaluated as feasible for SAWS, the initial construction could be in the range of $15 to $30 million dollars, and the annual savings could be between $1.5 and $3 million per year. Any additional gas generated and sold through SAWS gas program is not included in this analysis. PA has not included the cost or the benefit associated with this strategy as part of the efficiency study but recommends that SAWS evaluate this further.

### 6.8.5 Technology Related Recommendations

#### Recommendations

- Invest in high-efficiency energy savings devices: Energy savings opportunities within the treatment plant include using premium efficiency motors with adjustable speed drives, using effective instrumentation and control, and operating emergency generators for peak clipping when little or no storage is available.

#### Estimated Benefits

PA has not included this value in its efficiency quantification and recommends for SAWS to conduct an energy efficiency focused study.

## 6.9 Net Present Value (NPV) Calculation

PA calculated the NPV to be approximately $9.5 million based on the following assumptions:

- Cost of Capital: 5%[83]
- Annual O&M Benefits Anticipated:$1,252,000 in the first year. As benefits from the valve exercising program accrue each year, this is expected to grow to reach $2.3 million in Year 5. Annual savings in Year 5 are calculated to be approximately $3 million.
- Steady State Target: January 1, 2015
- Timeline: 5 Years (January 1, 2015 to December 31, 2019).

[83] Information from SAWS

- Inflation rate of 2.5%.

# SHARED SERVICES

# CONTENTS

# 7 SHARED SERVICES

## Overview

Shared services are defined as those services that are used by more than one department in a company. In general, shared service roles are different from operational roles. Operational roles vary widely depending on the core services of the company, whereas shared services are in general more standardized within each industry.

## Assessment Basis

Our analysis utilized data from PA's Shared Service Benchmarking Program. PA's Shared Services Benchmarking Program has been in existence for five years. Every year, a panel of utilities participates in this program, so that they can compare their shared services costs against other utilities. This process has resulted in a panel data set that is very robust, providing SAWS with cost comparisons that are comprehensive and more accurate than comparisons based only on publicly reported data. PA's analysis compares SAWS' 2012 spending levels to those of a panel of US utilities which includes, in addition to SAWS, 18 utilities in PA's program representing a range of types (electric, gas, water, wastewater, combination), size, and operating environments, for a total of 19 panel members.

## Methodology

The total, or absolute, cost of shared services for any company is directly related to the size of the company. However, the relative cost of shared services tends to decrease as a company's size increases, due to economies of scale that one would expect. Since no two companies are exactly the same size, to compare costs across a group of companies, the absolute level of cost needs to be normalized to adjust for various factors, such as size, FTEs, assets, and customer base. In the analyses performed for SAWS, the two principle metrics that were used to normalize total costs in a particular area were as follows:

- Full Time Equivalents
- The Massachusetts Formula - a widely accepted and time-tested approach for allocating many shared services costs among jurisdictions and utility affiliates, this formula was used in this analysis and considered three equally weighted measures of size – gross margin, net assets, and employee headcount.

## Overall Observations

The table below summarizes the areas that we analyzed and the findings of whether SAWS' costs for that function were higher than, aligned with, or lower than the median cost levels of PA's panel of national utilities. Higher than median findings are indicated by red arrows, which seem to indicate opportunities for improvement. Findings which were aligned with the panel are indicated by a horizontal orange arrow, while lower than median results are indicated by green arrows, which would indicate acceptable or favorable performance.

**Table 18: Summary of shared services areas evaluated and overview of results**

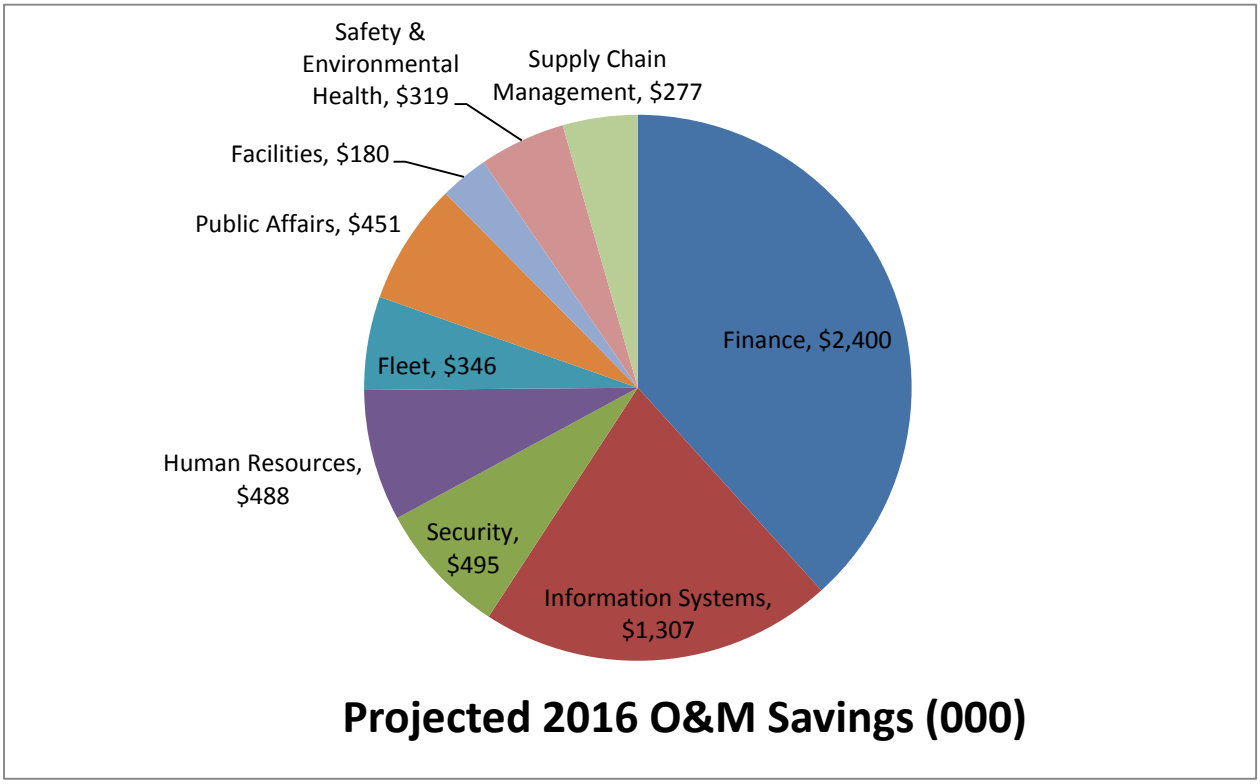
| | | Normalizer | | | | | |
|---|---|---|---|---|---|---|---|
| # | Shared Service Area | MA Formula | FTE | Customer | Miles Driven | Total Goods and Services | Square Foot |
| 1 | Facilities | → | | | | | → |
| 2 | Finance | ↓ | ↓ | | | | |
| 3 | Fleet | ↑ | → | | ↓ | | |
| 4 | Human Resources | ↓ | ↓ | | | | |
| 5 | Information Services | ↓ | ↓ | | | | |
| 6 | Legal | → | → | | | | |
| 7 | Public Affairs | ↑ | | ↑ | | | |
| 8 | Safety and Environmental Health | ↑ | ↑ | | | | |
| 9 | Security | ↑ | ↑ | | | | |
| 10 | Supply Chain Management | ↓ | | | | ↓ | |

Note: For some process areas, certain sub-processes were further analyzed by PA to provide greater detail or explore specific areas. Those sub-processes are not shown here, but in general were normalized by the same factor as the macro-process and results may differ.

## Expected Financial Benefits

PA was able to quantify an expected $6.3 million in annual efficiency gains and cost savings from nine of the ten areas analyzed. Figure 22 below shows the various sources of annual contribution from where these savings are expected when steady state is achieved in all areas, which is expected in 2016.

**Figure 22: Various sources of Annual O&M savings (2016) 84**

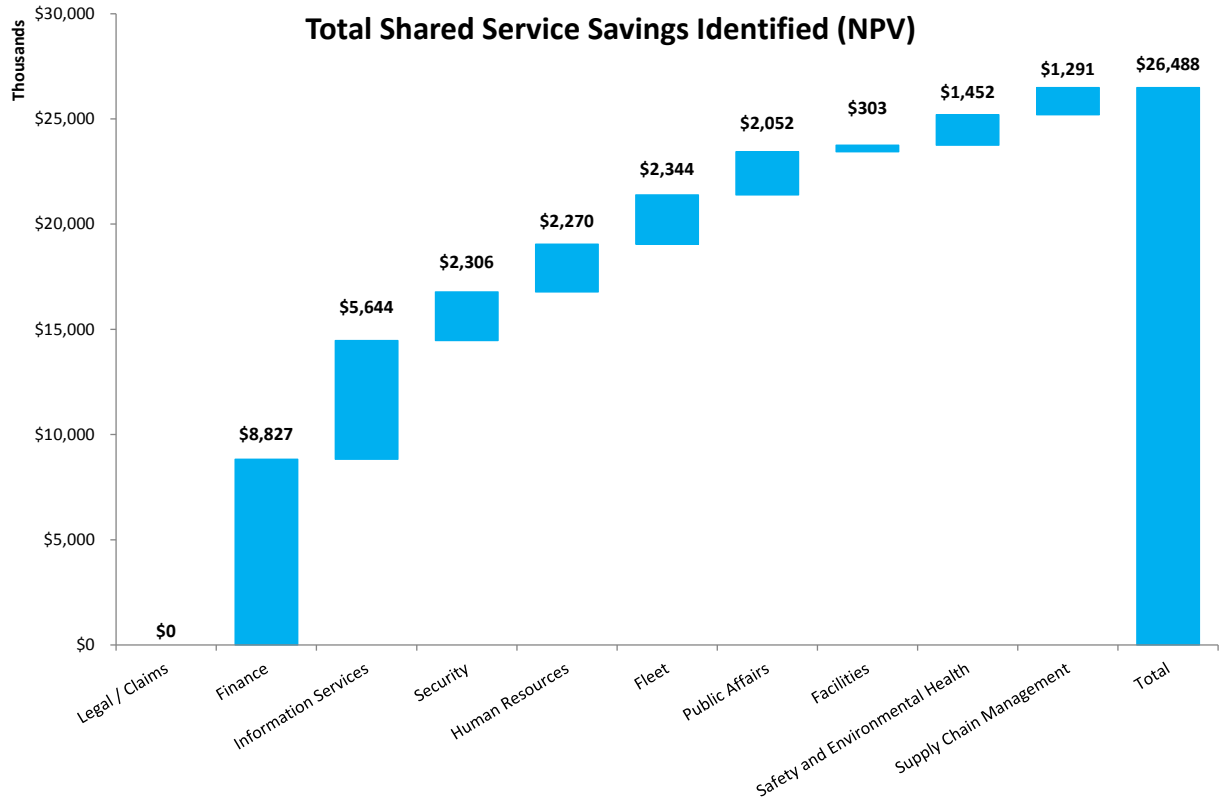



Since investments may be required in certain areas, PA also has quantified the Net Present Value (NPV) expected. NPV is calculated to be approximately $26.5 million under the following assumptions:

- Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Benefits accrued between January 1, 2015 and December 31, 2019.
- Investments of $885,000.
  - $535,000 for Building Management System (Facilities)
  - $300,000 for external assistance (Information Services)
  - $50,000 for construction of new gates and remote access for facilitating guard contract changes (Security)
- Discount rate of 5%.
- Inflation rate of 2.5%.

[84] Savings are in 2014 dollars

**Figure 23: NPV of total shared service savings**




## Recommendations

PA recommends implementing a suite of recommendations in the various areas that are collectively called shared services (listed in Table 19 below). In addition to the recommendations listed, our professional experience has shown that additional improvements may be possible in some of these areas; where appropriate, we have made a note of suggested improvements. These additional improvements are also expected to yield cost savings which are difficult to quantify at this level of review but can be more accurately forecasted with a more focused analysis. Therefore, these cost savings have not been included in this study.

**Table 19: Recommendations and expected savings**

| # | Recommendation | Type | Expected Annual O&M Savings | Shared Service |
|---|---|---|---|---|
| 1 | Conduct study on outsourcing options | Positions | $100,000 in potential savings through outsourcing and improved productivity. | Facilities |
| 2 | Upgrade Building Management System | Process | $80,000 due to reduced energy spending. | Facilities |
| 3 | Decrease Days of Operating Cash | Policy | A modest, gradual reduction to 270 days from the target of 300 will free up approximately $48 million. $2.5 Million (5% of $48 million) assumed from 2016 to 2019 after the period of | Finance |

| # | Recommendation | Type | Expected Annual O&M Savings | Shared Service |
|---|---|---|---|---|
| | | | heavy capital expenditures). | |
| 4 | Rationalize vehicles required and sell surplus stock | Policy | $750,000 in one time revenues. | Fleet |
| 5 | Avoided maintenance costs due to reduced fleet size | Process | $75,000 in annual avoided maintenance savings. | Fleet |
| 6 | Increase ratio of vehicles to maintenance staff | Process | $271,000 in potential savings through improved productivity. | Fleet |
| 7 | Reduce total training staff across the company | Positions | $384,000 in potential savings through increased productivity. | Human Resources |
| 8 | Reduce external vendor spend | Policy | $104,000 in potential savings through course rationalization. | Human Resources |
| 9 | Eliminate contractor positions and fill with full time employees | Positions | $981,000 | Information Services |
| 10 | ERSS CSS Cobol Support to be removed | Positions | $327,000 | Information Services |
| 11 | Improve alignment among public affairs responsibilities | Positions | $411,000 through better alignment and improved productivity. | Public Affairs |
| 12 | Re-evaluate survey costs | Process | $40,000 through fewer surveys. | Public Affairs |
| 13 | Combine Safety and Environmental Health, and Claims and Risk Management | Positions (Organization) | $319,000 in potential savings through organization restructuring. | Safety and Environmental Health |
| 14 | Renegotiate contracted guards | Positions | $420,000 in potential savings through renegotiation of contract for different coverage levels. | Security |
| 15 | Realign roles of SAWS Security department staff | Process | $75,000 due to improved productivity. | Security |
| 16 | Combine Purchasing, Supply, and Contracts under single management | Positions (Organization) | $192,000 in potential savings through organization restructuring. | Supply Chain Management |

| # | Recommendation | Type | Expected Annual O&M Savings | Shared Service |
|---|---|---|---|---|
| 17 | Implement a Capital Project Management System | Process (Technology) | $85,000 in productivity savings due to reduced manual processing. | Supply Chain Management |

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# METHODOLOGY

## Introduction

Shared services are defined as those services that are used by more than one department in a company. In general, shared service roles are different from operational roles. Operational roles vary widely depending on the core services of the company, whereas shared services are generally more standardized within each industry.

## 7.1 Processes Benchmarked

The following process areas were analyzed as part of shares services:

- Communications, advertising, and Governmental Affairs (collectively under Public Affairs),
- Facilities,
- Finance,
- Fleet,
- Human Resources,
- Information Services,
- Legal,
- Safety and Claims,
- Security, and
- Supply Chain Management.

## 7.2 Cost Benchmarking

Approach: Our analysis utilized data from PA's Shared Service Benchmarking Program. PA's Shared Services Benchmarking Program has been in existence for five years. Every year, a panel of utilities participates in this program, so that they can compare their shared services costs against their peers. Because of this panel's common interest in benchmarking Corporate and Shared Services, PA has the ability to review and validate financial, staffing, and process financial data collected from each company in significant detail for several years. This process has resulted in a panel data set that is very robust, providing SAWS with cost comparisons that are comprehensive and more accurate than comparisons based only on publicly reported data. Our analysis compares SAWS' 2012 spending levels to those of a panel of US utilities which includes, in addition to SAWS, 18 utilities in PA's program representing a range

of types (electric, gas, water, wastewater, combination), size, and operating environments, for a total of 19 panel members.

Data Source: Our analysis of SAWS' costs for the shared services processes examined the utility's 2012 actual financial results and used Full Time Equivalent (FTE) counts obtained from the 2012 budget. For the 18 peer panel utilities, the most recent available cost data is for calendar year 2011.[85] Therefore, to compare this data with SAWS's 2012 cost data, we inflated the 2011 peer utility costs by 1.7%.[86]

Sub-processes--Accounting for Organizational Differences: PA's Shared Services Benchmarking Program is based on a sub-process approach, in which larger processes are broken down into certain responsibilities and sub-costs. This allows for flexibility in comparing utilities that may be organized differently. For example, the Human Resources (HR) department is comprised of sub-processes that include costs for payroll, corporate training, employee relations, etc. More detail regarding each of the sub-process information is included in each shared service chapter. For some process areas, certain utilities are not included in the panel due to lack of data or anomalies in their structure. These utilities will benchmark as zero costs in the results.

The definition and responsibilities of a main process differ from utility to utility. Responsibilities for a specific activity may be in different functional groups in different utilities. When collecting cost data, we follow PA's Shared Services Benchmarking definitions that are used consistently by all peer utilities[87], and identify where in the organization a certain responsibility falls. For example, in this study, cost for PA's Supply Chain Management process was comprised of costs from both SAWS' Financial Services and Legal groups.[88]

We also realize that sometimes, the opposite occurs, in which case a SAWS functional group has responsibilities that need to be allocated to various processes. In these cases, we allocate the costs based on an activity-based ratio that best fits the responsibilities. For example, in this study, SAWS' Legal department has both contracting and legal counsel responsibilities. Therefore, a portion of the Legal group's costs is benchmarked in the Legal chapter, and a portion is benchmarked in the Supply Chain Management chapter.

Below are illustrative diagrams of these sub-process and department allocations:

**Figure 24: Example in which multiple SAWS departments have covered responsibilities in one sub-process as defined by the PA Shared Services sub-process.**


85 PA is currently collecting data for the 2012 peer panel study.

86 Bureau of labor Statistics: CPI Detailed Report Data for December 2012.

87 In the subsequent sections of the report, the definition is provided for each shared service process area.

88 A slightly different approach was taken for the IS department, as costs in those departments were given to PA in the different sub-processes with labor loadings.

**Figure 25: Example in which costs in one SAWS department must be allocated to multiple PA processes/sub-processes**


Estimating Labor Loading: Unloaded gross labor was given a constant weighting of an additional 46%[89] to account for labor-related benefit, pension and tax costs. In SAWS' case, the loading factor also has a certain percent of benefits allocated to Other Requirements, which was mainly unused sick and personal leave. This allocation of Other Requirements added an approximate 1.1% on top of the 46%, which brought the total labor loading to 47.1%. In calculating total labor dollars, we added this adjustment on top of any unloaded gross labor dollars to develop the total cost of labor.

For the costs associated with each sub-process, we included gross costs, overhead, and labor, even though some of the costs that year may have been capitalized. However, if sub-process costs were significantly over or under normal spending amounts, they were not included, as these costs often represent one-time investments that companies had made (for example, in 2012, SAWS headquarters installed a new security system. This cost is not included in the Security process).

Other Considerations: 2012 was a year of transition for SAWS, as it merged with BexarMet. Therefore, 2012 budget numbers for SAWS did not include allocations to BexarMet, and likewise, these allocations were not taken into account in this analysis, as it was determined that SAWS budgets are more accurate to examine as a standard for future operations.

Normalization: The total, or absolute, cost of shared services for any company is directly related to the size of the company. However, the relative cost of shared services tends to decrease as a company's size increases, due to economies of scale that one would expect. Since no two companies are exactly the same size, to compare costs across a group of companies, the absolute level of cost needs to be normalized to adjust for various factors, such as size, FTEs, assets, and customer base.

Some of the normalization factors that were used to adjust the data include the following:

- FTEs—FTE + part-time or temporary equivalents.
  - Source: Total FTEs counts were found in the 2013 Annual Operating and Capital Budget. FTEs were budgeted amounts for 2012. Part time employees were given FTE equivalents, and aggregated into the total.
- Total goods and services—all goods and services purchased that year, including contractual professional services and CIP costs.
  - Source: Sum of purchases made in 2012 by Purchasing Department (for goods and services) as well as Contracting Department (for CIP-related projects).
- Total customers—sum of water and wastewater accounts.

[89] SAWS Labor Loadings

  - Source: 2012 Comprehensive Annual Financial Report (page 107/110).
- Miles driven and Vehicles.
  - Source: 2012 Fleet Utilization Report.
- Square footage.
  - Source: SAWS Facility Square Footage Excel.
- Gross Margin.
  - Source: Water supply/delivery gross margin was provided by the SAWS Controller. Calculations for revenues included water supply and water delivery revenues as well as the Edwards Aquifer Authority (EAA) pass-through fee. Gross margin for water was calculated by subtracting the costs associated with water payments, options and holding payments, as well as utilities, chemicals, and maintenance for the Aquifer Storage and Recovery (ASR) facility. Wastewater gross margin was calculated using a similar method in which utility and chemical costs were subtracted from revenues for wastewater service.
- Net Utility Assets.
  - Source: 2012 Comprehensive Annual Financial Report (Total Capital Assets (net of accumulated depreciation)).
- Massachusetts Formula (MA Formula).
  - The Massachusetts Formula is used to provide a general indication of cost benchmarking based on utility size. To normalize for size across PA's data set, this methodology used three equally weighted measures of size – gross margin, net assets, and employee headcount. These factors comprise the MA Formula, a widely-accepted and time-tested approach for allocating many shared services costs among jurisdictions and utility affiliates.
- The Massachusetts formula approach allows us to directly compare costs across our panel of utilities, where they range in size. This normalization is a three step process:

**Step 1: Calculate the Average Massachusetts Formula for the peer group:**

Separately total the gross margin, net assets and headcount for each utility in the panel;

Calculate the percent of the total for each utility's (1) gross margin, (2) net assets, and (3) headcount;

Determine the average of gross margin, net assets, and headcount above for each company;

This average percentage equates to the average Massachusetts Formula for each of the other utilities in the peer group.

**Step 2: Calculate the Normalization Factor**

For each utility in the panel, divide its average Massachusetts Formula, from Step 1 above, by the average Massachusetts Formula for SAWS, also from Step 1 above;

This result is the normalization factor for each utility.

**Step 3: Normalize the Services Cost for each Utility in the Panel**

Multiply the normalization factor, determined in Step 2 above, by the actual 2012 costs for each shared service process area for each utility in the peer panel;

Costs of the shared service process areas for all the utilities in the panel are now normalized.

Now, each member of the peer panel has been adjusted in size to that of SAWS.

Summary For all shared service areas, results are shown normalized by the Massachusetts Formula. Depending on the shared service area under consideration, the normalized comparison based on number of customers, FTEs, or total miles driven, as appropriate, may be the most applicable.

For some process areas, the allocation of SAWS accounting units and the PA peer panel shared services definitions aligned easily, so we were able to take a more-detailed examination into specific sub-processes.

# FACILITIES

## Executive Summary

### Overview

SAWS owns and manages approximately 680 widely dispersed properties comprising 15,500 acres of land, which are comprised of lift stations, pump stations, treatment plants, vacant property, and office space. The group is responsible for providing custodial service, maintenance, and repair (i.e., HVAC, electrical, etc.) services.

### Overall Observations

With 43 FTEs responsible for facilities related functions, from a cost efficiency standpoint, total facilities costs on a per square foot basis are near the median cost levels when compared with the PA panel of national utilities and at median levels when normalized by the Massachusetts Formula. This indicates that costs are generally reasonable and acceptable.

### Areas of Excellence

- *Serving a Dispersed Infrastructure:* Unlike many utilities, SAWS provides water, wastewater, and recycle water services to a wide geographic area utilizing a dispersed infrastructure. Other utilities may have one or a few large inlets and treatment facilities. SAWS has hundreds of various-sized infrastructure sites requiring maintenance, security, that increase managed square-footage, chemical storage and handling, safety measures, and the staff and equipment to maintain them. In addition to water production sites, SAWS maintains sites for wastewater and recycled water as well.
- *Recognizing the Need to Reconsider Existing Facilities:* SAWS is currently implementing a Field Services Efficiency Program which is a phased multi-year project to improve service efficiencies and growth in SAWS' service area as well as the addition of the former Bexar Metropolitan Water District service area. This will lead to efficiencies not calculated in this report.

### Areas of Potential Improvement

- *Facilities Maintenance and Management Strategy:* SAWS is one of the few utilities in the nation that continues to provide all facilities-related services using internal resources. SAWS should evaluate which of these services can be outsourced and which ones should be provided internally.
- *Energy Efficiency:* Evaluate better energy and lighting management strategies, including investment in energy efficient devices at various facilities.

## Recommendations and Expected Financial Benefits

PA has recommendations in the Facilities area expected to result in approximately $180,000 in annual Operations & Maintenance (O&M) savings through outsourcing certain custodial services and reduced energy spending. It is recommended that proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

NPV is calculated to be approximately $0.30 million under the following assumptions:

- Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Investment of $535,000 in a Building Management System.
- Benefits accrued between January 1, 2015 and December 31, 2019.
- Discount rate of 5%.
- Inflation rate of 2.5%.

**Table 20: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Outsource custodial services and Improve Productivity | Positions | $100,000 in potential savings through outsourcing and improved productivity. |
| 2 | Evaluate Business Case for Improved Energy Management | Process | $80,000 due to reduced energy spending which should increase as SAWS replaces older inefficient service centers with new construction. |

## Introduction

SAWS owns and manages approximately 680 properties and maintains 15,416 acres of physical assets comprised of lift stations, pump stations, treatment plants, vacant property, and office space. The group is responsible for providing custodial service, maintenance, and repair (i.e., HVAC, electrical, etc.) services for diverse types of infrastructure, including dams, rural properties, communication tower sites, well sites, pump-stations, water recycling centers, and many others. This function's objective is to provide efficient infrastructure and facilities that supports SAWS mission and vision and allows SAWS staff to perform productively.

There are 43 FTEs employed in this function including:

- Managers, Superintendents, Foremen, and Crew Chiefs.
- Ground Maintenance Inspectors, Facility/Building Technicians, Mail Distribution Clerks, and Custodians.
- Master Electrician, Building and Refrigeration Technician, Journeyman Electrician, and an Administrative Assistant.

Key responsibilities in this area include providing the following:

- Custodial services.
- Facilities Maintenance.
- Facilities Management.
- Energy management, space management/planning/relocating services, architectural & design services, furniture and equipment management, event coordination, renting of facilities (outside conferences and events), special events, mail & delivery services, fire alarm management, and elevator services.
- Constructability Reviews and Construction Management.
- Production and City of San Antonio construction projects which impact operations at SAWS facilities, such as site planning, environmental site assessment, and temporary facility installations (trailers).
- Emergency Planning and Disaster Recovery.

# 7.3 PA Cost Benchmarking

### 7.3.1 Responsibilities and Sub-Process Definitions

The PA Facilities process responsibilities include the following:

**Table 21: PA Facilities responsibilities**

| Sub-Process | PA Facilities sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Asset Management – Owned | Optimize the life cycle costs for each facility, including parking facilities, through acquisition, financing, maintenance, refurbishment, and disposal policies and practices. In addition to space planning, move management and drawings, it also includes capital activities such as demolition and construction of facility improvements/expansions. Includes costs for new furniture and office equipment. | Facilities Management and Service Center Facility Plan (Operations Services Group) Headquarters |

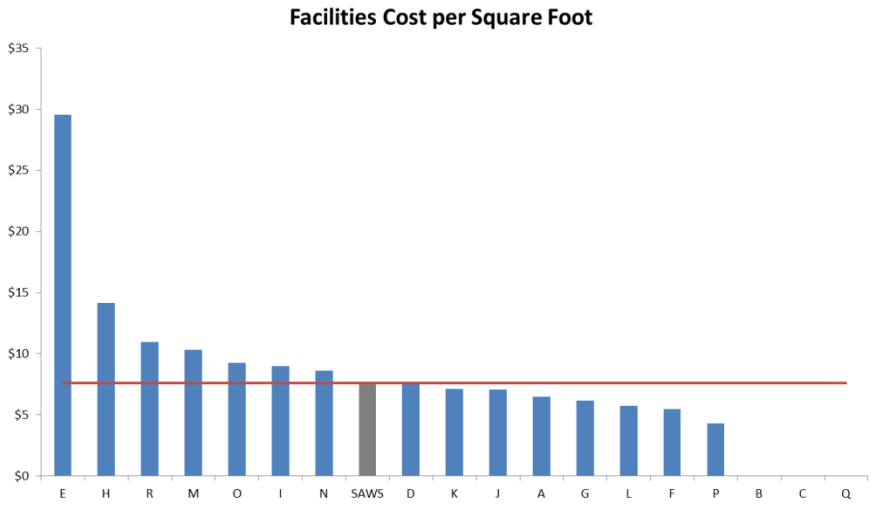
| Sub-Process | PA Facilities sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Operations and maintenance | Costs to provide janitorial services, routine preventative and corrective maintenance, metered utilities costs, landscaping, and trash/waste removal. | Facilities Maintenance and Headquarters (Operations Services Group) |

Note: There were some costs in the Facilities group that were associated with non-facilities related costs. These costs were adjusted at the individual accounting unit level.

### 7.3.2 Results

The chart below compares the total cost of providing facilities related functions per square foot for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 26: Facilities cost per square foot**



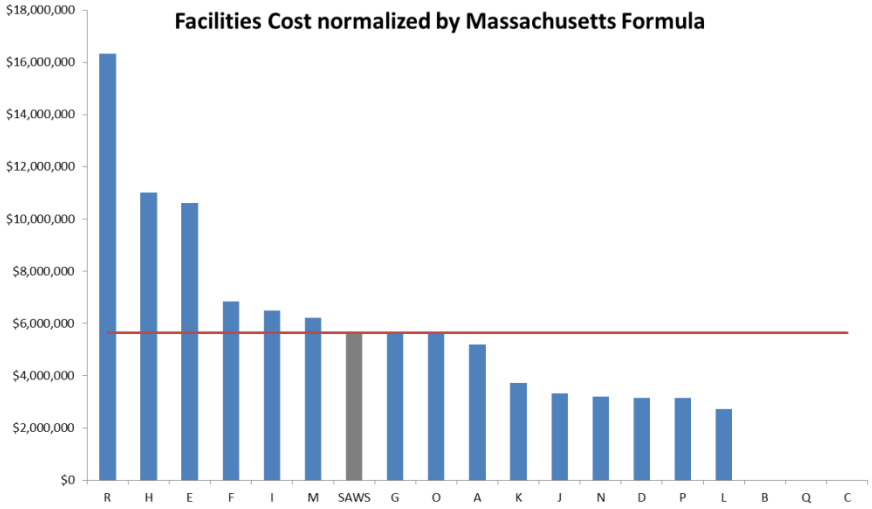

Overall, facilities and maintenance costs per square foot are at the median cost levels. Total square footage used for this analysis was 613,624 square-feet, and includes the following locations:

**Table 22: Facilities included in Total Square Footage**

| Facility | Type | Total |
|---|---|---|
| Eastside Service Center Admin + fleet | Admin/ Service Center | 61,600 |
| Eastside Service Center Meter shop | Welding/ meter shop | 8,360 |
| Eastside Service Center Trailers (3) | Admin/ crew quarters | 3,760 |
| Mission Road Quality Control Bldg. | Administrative Bldg. | 16,950 |
| Mission Road Service Center | Service Center | 16,665 |
| Northeast Service Center | Service Center | 9,580 |
| Northwest Service Center | Service Center | 5,820 |
| Van Dyke Service Center | Service Center | 6,549 |
| ASR / Twin Oaks | Water Treatment Plant | 4,153 |
| Dos Rios O&M building | WRC | 47,400 |
| Dos Rios Admin (old lab) | WRC | 12,814 |
| Dos Rios Fleet garage | WRC | 14,092 |
| Dos Rios New lab | Lab Services | 16,250 |
| Leon Creek Admin building | WRC | 2,759 |
| Leon Creek mechanics trailer | WRC | 2,331 |
| Medio Creek Admin building | WRC | 4,286 |
| Medio Creek mechanics building | WRC | 1,504 |
| Headquarters | Tower 1 | 168,862 |
| Headquarters | Tower 2 | 131,272 |
| Heating and Cooling | plant and admin | 23,000 |
| Cherry Street | plant and admin | 26,288 |
| Hildebrand | EMT Evac Site | 2,250 |
| Basin | Pump Bldg | 4,256 |
| ASR | | 8,230 |
| Leon Creek | | 5,190 |
| 34th St. | Pump Bldg | 3,060 |
| Artesia | Pump Station Tank | 3,700 |
| Southcross | Payment Center | 2,643 |
| **Total** | | **613,624** |

The chart below compares the total cost of providing facilities-related functions normalized by the Massachusetts formula for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 27: Facilities cost normalized by Massachusetts Formula**




Based on our analysis, total facilities costs on a per square foot basis are at median cost levels when compared with the PA panel of national utilities and at median levels when normalized by the Massachusetts Formula.

The main driver of facilities costs is most likely the fact that SAWS service territory is spread over a large territory. Given the distances between facilities that must be maintained, the median performance is commendable.

## 7.4 Area Specific Analysis – Field Services Efficiency Program (Program)

SAWS is currently implementing a Program which is a phased multi-year project to address service efficiencies and growth in SAWS' service area as well as the addition of the former Bexar Metropolitan Water District service area.

This Program will address health, welfare, and safety associated with Operations' current facilities. SAWS should experience a large increase in energy efficiency as these older energy-inefficient buildings are replaced with new construction. The Program will relocate and realign SAWS field operations to new and upgraded facilities throughout the expanded service area. This Program is expected to yield improved response times and result in more efficient dispatching of SAWS crews. This is also expected to reduce the amount of drive time for crews across the city. The five projects that are part of this Program include:

- New Service Center Project:
  - Complete new West Side Operations Center (WSOC)
  - Complete new North Side Operations Center (NSOC)
  - Relocate all assigned crews, equipment, supply, and staff into each new facility.
- Field Operations Realignment Project at ESOC:
  - Complete new buildings at East Side Operations Center
  - Relocate all assigned crews, equipment, supply, and staff into each new facility.
- Production Operations Facility:
  - Complete Production Operations facility
  - Decommission Mission Road Service Center

- Nacogdoches Pump Station Facility and Fuel Remediation Project:
  - Develop adjacent property to relocate fuel and build fleet facility
  - Complete new buildings at Northeast Operations Center (NEOC)
  - Relocate all assigned crews, equipment, supply, and staff into each new facility.
- Field Operations support at Dos Rios WRC Project:
  - Develop area for fleet parking for Lift Station Maintenance and SSO crews at Dos Rios
  - Complete facility assessments, upgrades, and new construction as approved at Dos Rios
  - Relocate all assigned crews, equipment, supply, and staff into each new facility.

SAWS has developed a Business Case for these planned improvements that projects the cost of the New Service Center Project at approximately $30.8 million and the cost for the Field Operations Realignment Project at ESOC at approximately $11.9 million. Contingency is allocated at 3% of construction and 10% of furniture, fixtures, and equipment (FF&E).

SAWS anticipates approximately $11 million of the total costs will be provided through the sale of existing facilities. SAWS has also calculated ongoing operations and maintenance-related savings attributed to the Service Center Study as follows:

- Savings in mileage and wages for 10 crews working out of ESSC compared to 10 crews working out of Tradesman visiting 77 sites twice per week:
  - Savings per year: $568,648
  - Savings over 30 years: $17,059,442
- Savings in mileage and wages for 30 crews working out of MRSC compared to 30 crews working out of NWSC for a daily round trip:
  - Savings per year: $234,000
  - Savings over 30 years: $7,020,000
- Savings in mileage and wages for a crew working out of MRSC compared to a crew working out of Medio Creek visiting 684 sites per year:
  - Savings per year: $1,484,203
  - Savings over 30 years: $44,526,096
- Savings in mileage and wages for 10 SSO sites for one crew and one follow-up crew working out of ESSC compared to Medio/Tradesman for a daily round trip:
  - Savings per year: $2,939
  - Savings over 30 years: $88,169
- While PA reviewed the Business Case prepared by SAWS to understand the strategic intent and the specific activities associated with the project, PA has not performed a due diligence around assumptions and calculations employed by SAWS in preparing the Business Case summarized above.

## 7.5 Observations

From a cost efficiency standpoint, total facilities costs on a per square foot basis are at median cost levels when compared with the PA panel of national utilities and at median levels when normalized by the Massachusetts Formula indicating that costs are generally reasonable and acceptable. However, there are opportunities for improvement.

- SAWS has a few facilities in which employees do not report to, or the space is unutilized. There may be opportunities to expedite the process for real estate disposal (approval/condemnation process) and to generate more lease revenues (i.e. cell towers).

- Many of the nation's utilities have outsourced the facilities management and maintenance function while SAWS continues to use internal resources to provide these services.
- SAWS outsources the majority of its corrective and heavy maintenance work when it is feasible and efficient to do so as certain trades are not cost-effective for SAWS to employ full-time. SAWS solicits bids to perform non-professional but skilled services to perform these types of tasks, such as: Full unit A/C replacements; fire alarm inspection; substantial office renovations; roof repairs and replacement; all environmental testing, remediation, and demolition work; and elevator repair and maintenance, among others.
- The Program is a huge undertaking on SAWS part. SAWS has assembled a well-qualified team with a large stakeholder group and has prepared a very clear project charter that should minimize implementation risks.
- SAWS is currently implementing FaciliCAD, a comprehensive Facilities Management software that tracks function, employee locations, assets and square footages, and provides for internal departmental move management for every facility that SAWS manages. SAWS has converted all 6 service center original hand drawn floor plan drawings into CAD software and has merged the HR database of employees with FaciliCAD to track locations and use (square footage use) of every employee and department.

## 7.6 Recommendations and Estimated Benefits

### 7.6.1 Conduct Study on Outsourcing Options

Custodial services and other services, such as routine furniture movement, meeting room preparation and setup, emergency porter calls, assistants to journeyman electricians, contractor escorts, etc. are being provided at the following locations:

- 300,000 sq. ft. at Headquarters.
  - Headquarters custodial services are provided by an annual outsourced contract valued at $239,000 from 6 p.m. to midnight weekdays. This represents 34% of all custodial services provided by SAWS. The other 66% of the costs is handled by SAWS employees.
- 156,000 sq. ft. at 5 Service Centers.
- Coverage at Pump Stations and Treatment plants.

#### Recommendations

- SAWS should conduct a study to determine if outsourcing custodial services to an external third party outweighs the total loaded costs (salaries and benefits) of the FTEs currently providing those services.

#### Estimated Benefits

PA estimates that through a combination of outsourcing and/or improving productivity, SAWS is expected to realize approximately $100,000 in annual savings. It is recommended that these proposed resource re-directions be managed in a non-disruptive manner over an 18-month period.

### 7.6.2 Upgrade Building Management System (BMS)

The existing BMS does not meet the needs of the SAWS Headquarters composed of the Administration Building (Tower I) and the Customer Service Building (Tower II) located at 2800 US Highway 281 North, and the Environmental Services Laboratory located at 3610 Valley Road.

## Recommendations

PA recommends and SAWS is currently pursuing an upgrade of the existing BMS.  A new BMS is expected to increase equipment efficiency and reliability.

## Estimated Benefits

SAWS has estimated 15% reduction in energy spending in Tower I and Tower II, which translates to approximately $80,000 in reduction in energy costs.

# FINANCE

## Executive Summary

### Overview

The Financial Services Group (FSG) at SAWS reports on SAWS' financial position, ensures financial compliance, and provides financial support services and guidance.

### Overall Observations

With 38 staff responsible for finance related functions, from a cost efficiency standpoint, the SAWS FSG is below median, and compares favorably when measured against the PA panel of national utilities.

### Areas of Excellence

- *Strong Position:* Strong performance in financial metrics such as return on assets or cash reserve.
- *Efficiency:* Low cost of operations combined with high levels of effectiveness.
- *Recognition:* Recipient of several regional and national awards with respect to financial performance.

### Areas of Potential Improvement

- *Policies:* SAWS has a conservative debt portfolio and many of its financial practices, such as the level of days of cash reserve, are structured to be very conservative. Revisiting these policies has the potential to generate significant one-time cash inflows.

### Recommendations and Expected Financial Benefits

PA has policy-related recommendations in this area that have the potential to generate significant ($2.4 million) financial benefits for SAWS, although SAWS must discuss this further with its financial advisor to ensure that the two recommendations do not compromise its current financial position.

NPV is calculated to be approximately $8.8 million under the following assumptions:

- Benefits accrued between January 1, 2016 and December 31, 2019.
- Discount rate of 5%.
- Inflation rate of 2.5%.

**Table 23: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Decreasing Days of Operating Cash | Policy | A modest, gradual reduction to 270 days from the current level of 342 would free up approximately $48 million to be directed toward future capital improvements. Assuming a 5% borrowing rate, this reduction would generate additional interest savings of approximately $2.4 million per year (assuming $2.4 million in annual savings from 2016 to 2019). |
| 2 | Balancing Variable Debt | Policy | Better matching of variable rate debt with cash and investment levels is expected to generate up to $6.8 million in annual interest cost savings. As the level of these savings is dependent upon the level of short-term interest rates, no long-term benefit was quantified. |

## Introduction

The Financial Services Group (FSG) at SAWS reports on SAWS' financial position, ensures financial compliance, and provides financial support services and guidance. The Chief Financial Officer (CFO) has primary oversight for FSG. FSG's primary responsibility is to ensure efficient operation by effectively managing and reporting on the corporate financial position, ensuring compliance with current legal and regulatory requirements, and providing timely financial support, services, and guidance to internal and external stakeholders. The CFO's specific functional areas include the following core financial functions:

- Budgeting and Rates (financial planning) – Responsible for short- and long-range financial plans as well as developing and implementing the budget. This area has a total annual budget of approximately $0.4 million.
- Accounting – Manages financial reporting, general accounting, property accounting, sundry billing, and payroll. This area has a total annual budget of approximately $0.9 million.
- Accounts Payable – Responsible for the vendor disbursement function of SAWS. This area has a total annual budget of approximately $0.3 million.
- Treasury and Finance – Handles investment management, cash management, and bank relationship management as well as securitization and overall management of the utility's debt. This area has a total annual budget of $0.4 million.
- CFO - Responsible for the leadership of the Financial Service Group. This area has a total annual budget of $0.3 million.

In addition to the above core finance- and accounting-related functions, the CFO also oversees the following functions, which are covered separately in other sections of this report:

- Purchasing – Manages the processing and contracting of all purchasing requests for materials, supplies and services. This area has a total annual budget of $0.5 million.
- Supply – Responsible for inventory and distribution support of all materials for SAWS. This area also operates and manages five fuel stations owned by SAWS. These stations dispense both unleaded fuel and diesel fuel. This area has a total annual budget of $0.8 million.

# 7.7 Cost Benchmarking

### 7.7.1 Responsibilities and Sub-Process Definitions

The PA Finance process responsibilities include the following for benchmarking purposes:

**Table 24: PA Finance process responsibilities**

| Sub-Process | PA Finance Sub-process Definition | SAWS Division (or Group) |
|---|---|---|
| General Accounting | Costs associated with managing the monthly closing process and preparing standard monthly journal entries.<br>Journal entries, account reconciliations, centralized accounting for long-term debt, stock awards, legal reserves, environmental reserves, pensions, and retiree healthcare. | Accounting (Financial Services) |
| Manage systems and databases (Master data setup) | Master data setup - vendors, projects, accounts, etc.<br>Manage databases and systems which support all finance functions. | Financial Services |

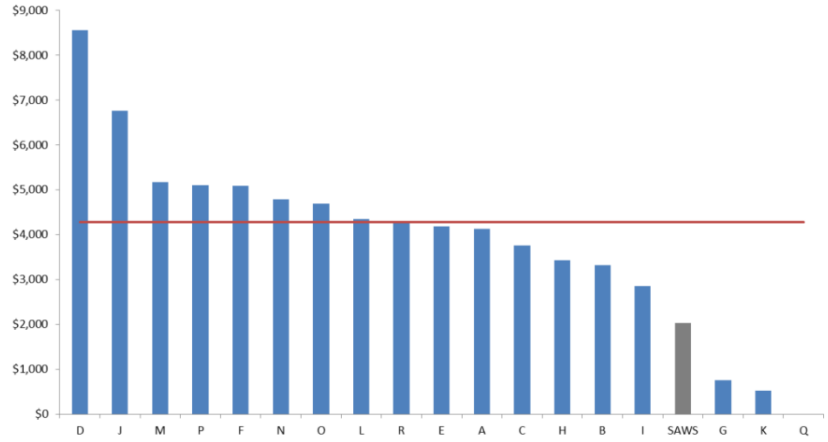
| Sub-Process | PA Finance Sub-process Definition | SAWS Division (or Group) |
|---|---|---|
| Technical and Accounting Policy | Managing accounting policies and procedures, and technical accounting. | Accounting (Financial Services) |
| Payroll | Payroll employee services, payroll processing, time management, time entry. | Accounting (Financial Services) |
| Accounts Payable | Invoice processing, expense reimbursements, other costs (including accounts payable system support, Unvouchered Liability (UVL) support, vendor Help Desk support, and the processing of vendor 1099s. | Accounting (Financial Services)<br>Contracting Administration (Legal) |
| Corporate Strategy & Development | 1) Strategic Planning -- scanning the corporation's business environment, analyzing strategic issues, developing strategy recommendations, and allocation of resources to the corporation's key businesses.<br>2) Analyzing Merger / Acquisition and divestiture opportunities.<br>3) Investigate and analyze opportunities for the creation of new businesses. | Financial Planning (Financial Services) |
| Long Range Multi Year Financial Planning (from Year 3 and beyond) | Long-Range/Multi-year financial modeling.<br>Includes: Assessing the business environment , identifying key issues, developing business unit strategies and objectives, examination of alternatives, developing the multi-year Earnings/Margin/Cash/O&M/Capital Plan, modeling the financial impact of new capital investments (non-M&A) and balance sheet restructuring, modeling for regulatory filings, and performing analytic support for external stakeholders. | Financial Planning (Financial Services) |
| Operational Planning/Budgeting and analysis (next year Plan information) | Operational Planning and analysis - Business Unit, departmental financial business plans, and consolidation of corporate plans (current year budget and year 2 budget). | Accounting and Financial Planning (Financial Services) |
| Managerial Reporting & Analysis (financial ONLY - current year actuals and remaining year forecast) | Analyze results and prepare variance commentary for Earnings/Margin/O&M/Capital within a company or Business Unit, as well as consolidation of all departments. | Accounting and Financial Planning (Financial Services) |
| Forecasting - Business Unit Level (current year) | Preparing and/or revising forecasts for earnings, margin, cash, O&M, and capital within a company or Business Unit. Performing what-if analysis for various scenarios (current year) for Business Unit decision making. | Financial Planning (Financial Services) |
| Forecasting - Corporate Level | Prepare and/or revise forecasts for earnings, margin, cash, O&M, and capital for all companies for executive management/board of | Financial Planning (Financial Services) |

| Sub-Process | PA Finance Sub-process Definition | SAWS Division (or Group) |
|---|---|---|
| | directors. | |
| Cash Management | Managing short term borrowing, compliance/ administration, bank relationships, bank fee analysis, and cash forecasting. | Treasury and Finance (Financial Services) |
| Corporate Finance and Treasury | Debt placement timing and analysis, debt placement fees, and debt compliance. | Treasury and Finance (Financial Services) |
| Financial planning and policy | Financial planning and policy – Developing a long-range financing strategy to maximize value consistent with the targeted credit profile, setting balance sheet targets, developing and recommending hurdle rates for the company's business lines. Excludes: commitment fees, typically for the unused portion of a lending facility, are outside the scope of the survey. | Treasury, Finance, and Financial Planning (Financial Services) |
| Managing Rating Agency Relations | Rating agency relations – Managing communications with the three agencies. Included here are annual rating maintenance fees and commercial paper surveillance fees. | Treasury and Finance (Financial Services) |
| Pension and Trust Management | Internal costs incurred by the company and not charged to the trusts to oversee, manage, administer, account for, and maintain compliance for the trust assets overseen by the company.<br>Company FTEs and associated salary and benefits directly charged to the Trust to oversee, manage, administer, account for, and maintain compliance for the trust assets overseen by the company | Accounting, Finance, and Treasury (Financial Services) |

### 7.7.2 Results

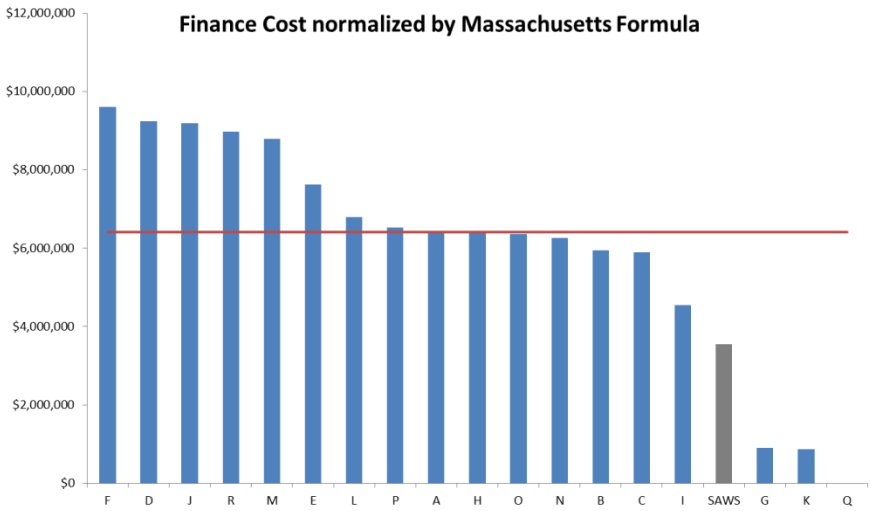
The chart below compares the total cost of providing finance-related functions per FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 28: Finance Cost per FTE**




The chart below compares the total cost of providing finance-related functions normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 29: Finance Cost normalized by Massachusetts Formula**




## 7.8 Observations

SAWS' financial function is highly efficient. A few examples of the department's successes include:

- Strong Credit Rating – SAWS has maintained a strong credit rating from the three major credit rating agencies enabling it to borrow funds at attractive rates. In 2013, SAWS received an upgrade from Standard & Poor's on its senior lien debt to AA+ from AA, and to AA from AA- on its junior lien debt. As a result of this upgrade, all three rating agencies now have SAWS senior lien obligations rated in the second highest credit rating, AA+, Aa1, and AA+.
- Refinancing - Taking advantage of the historically low interest rate environment and SAWS strong credit ratings, in 2011 SAWS refunded over $165 million of outstanding bonds, reducing future debt service payments by more than $21 million. Also in 2012, SAWS refunded nearly $305 million of outstanding bonds, reducing future debt service payments by more than $74 million.

- Awards and Acknowledgments– SAWS has been nationally recognized by the Government Finance Officers Association of the United States and Canada (GFOA) and was awarded a Certificate of Achievement for Excellence in Financial Reporting for its Comprehensive Annual Financial Report for the year ended December 31, 2011, an award SAWS has received for nineteen consecutive years. Additionally, SAWS was awarded the Distinguished Budget Presentation Award for its annual budget document for the fiscal year beginning January 1, 2013, an award SAWS has received for nine consecutive years.

## 7.9 Metrics Benchmarking

The chart below shows data from the Business Operations benchmarking results from the 2011 AWWA Benchmarking Performance Indicators Report:

**Table 25: Business Operations benchmarking results**

| SAWS Score | Ranking | Area of Evaluation | AWWA Top Quartile | AWWA Median Quartile | AWWA Bottom Quartile |
|---|---|---|---|---|---|
| 55.73% | Bottom | Debt Ratio | 17.90% | 31.60% | 47.80% |
| 342 | Top | Cash Reserve | 336 | 186 | 85 |

### 7.9.1 Financial Position Evaluation

SAWS benchmark data of key financial parameters is strong except for debt ratio, which is high at over 50%. However, combined debt service coverage (the ratio of cash available for annual principal and interest payment of debt) is good to modest at 1.6x (this metric usually becomes a concern when it drops below 1.3x). This high debt ratio appears to explain why SAWS maintains such high cash position:

**Table 26: Pay-Go Capital contribution**

| ($"000) | FY 12 | FY 11 |
|---|---|---|
| O&M (net of capitalized costs) | $ 237,576 | $ 209,058 |
| Pay-Go Capital Contributions | $ 100,700 | $ 55,700 |
| Total Cash & Investment (including restricted) | $ 517,876 | $ 528,761 |
| | | |
| Total Cash & Investment (unrestricted only) | $ 183,967 | $ 188,049 |

### 7.9.2 Cash Reserve

SAWS currently maintains a high liquidity (Cash and Investment) level - $0.5 billion in both FY 11 and FY 12 on an O&M base of $0.24 billion and $0.21 billion in FYs 11 and 12 respectively, resulting in a high days operating cash level (over 300 days) as shown in our table above. Days of operating cash is calculated based on unrestricted cash which is deemed available for O&M, plus a portion of restricted cash specifically restricted for O&M per a City of San Antonio ordinance which requires the establishment and maintenance of a 60 day operating reserve.

### 7.9.3 Debt Portfolio

SAWS has a very conservative debt portfolio. Currently, SAWS has over $2.2 billion in outstanding long term debt – 95% ($2.1 billion) is fixed rate debt while only a modest 5% ($0.1 billion) is variable rate debt. While this posture ensures certainty in debt service payments and minimizes exposure to interest rate fluctuations in the variable rate market, this portfolio could be better optimized by relying on the natural hedge provided by SAWS large cash reserves – which are mostly also invested in the short term market. Because of this mismatch, SAWS is paying a higher debt service on some portion of its liabilities which are pegged to long-range interest rates, while receiving lower investment yields on its assets which are pegged to short-range interest rates.

## 7.10 Recommendations and Estimated Benefits

### 7.10.1 Balance Variable Debt

With over $2.2 billion outstanding long term debt – 95% ($2.1 billion) is fixed rate debt while only a modest 5% ($0.1 billion) is variable rate debt.

#### Recommendations

Better matching of variable rate debt with its cash and investment level will result in improved cash position and performance.

#### Estimated Benefits

SAWS can gradually increase its variable rate exposure up to its natural hedge level (Cash/Investment balance) or variable rate cap (typically 20 – 25% of portfolio per rating agency metrics), whichever is lower, and achieve $1.8 - $6.1 million additional cash inflow. SAWS should, however, further discuss this approach with its financial advisors.

An illustration of the financial impact of the current position is depicted below. In FY 12 if Variable Rate debt had been increased to 10% ($0.2 billion) or 15% (0.3 billion) of portfolio, it would have yielded net cash flow savings of $1.8 million and $6.8 million, respectively. Since the level of these savings is dependent upon the level of short-term interest rates, no long-term benefit was quantified.

**Table 27: Financial impact of the current position**

| ($"000) - Current State | FY 12 | FY 11 |
|---|---|---|
| Total Cash & Investment (including restricted) | $ 517,876 | $ 528,761 |
| Bonds Payable | $ (1,987,810) | $ (1,894,230) |
| Variable Rate debt (CP program) | $ (170,745) | $ (214,930) |
| | | |
| Investment Yield @ 50BP) | $ 2,589 | $ 2,644 |
| Interest On Bonds Payable @ 5% | $ (99,391) | $ (94,712) |
| Interest (plus fees) On Variable rate debt @ 1. 0% | $ (1,707) | $ (2,149) |

| | | |
|---|---|---|
| NET CASH FLOW | $ (98,509) | $ (94,217) |

| ($"000) - Doubling of Variable Rate Exposure in 2012 | FY 12 | FY 11 |
|---|---|---|
| Total Cash & Investment (including restricted) | $ 517,876 | $ 528,761 |
| Bonds Payable | $ (1,817,065) | $ (1,894,230) |
| Variable Rate debt (CP program) | $ (341,490) | $ (214,930) |
| | | |
| Investment Yield @ 50BP) | $ 2,589 | $ 2,644 |
| Interest On Bonds Payable @ 5% | $ (90,853) | $ (94,712) |
| Interest (plus fees) On Variable rate debt @ 1. 0% | $ (3,415) | $ (2,149) |
| NET CASH FLOW | $ (91,679) | $ (94,217) |
| **Savings** | **$ (6,830)** | **$ (0)** |

## 7.10.2 Decrease Days of Operating Cash

SAWS currently maintains over $0.5 billion in cash and investment. Although a large portion of the cash and investments are restricted, SAWS achieved 342 days of operating cash reserve by the end of fiscal year 2012, versus its current target of 300 days.

### Recommendations

Though there is no doubt that this significant amount of cash is a major factor in SAWS' current strong credit rating, SAWS should discuss with its financial advisors whether this cash reserve could be further optimized without impacting its strong credit rating.

### Estimated Benefits

A modest and gradual reduction to 270 days will free up approximately $48 million, which can then be used to directly buy-down future rate increases by self-funding or Pay-Go financing certain capital projects.

Approximately $80M of existing cash on hand is committed to CIP projects currently in process. A significant portion of this relates to Water Supply projects that will be completed over the next few years. As this money is spent, days cash on hand will correspondingly decline from current levels. SAWS is required by Ordinance to maintain a minimum of 60 days cash. The $80M committed to existing CIP projects adds another 123 days. Additionally, SAWS currently expects to budget another $50M of cash funding for the 2014 CIP budget, adding another 77 days. Total days cash on hand based on this analysis would need to be 260 days. PA has added another 10 days for margin and estimates that 270 days of cash on hand should be a reasonable metric to strive for.

# FLEET

## Executive Summary

### Overview

The Fleet Management Department is within the Operations Services Group at SAWS. It provides vehicles, equipment and maintenance service for employees. It is also responsible for maintaining the SAWS corporate vehicle pool program.

### Overall Observations

With a total staffing of approximately 51 FTEs responsible for the Fleet function, from a cost efficiency standpoint, PA found that SAWS is slightly higher than median cost levels when compared to the PA panel of national utilities. Through the interviews conducted, PA has several observations around fleet utilization, maintenance practices, fleet policies, and procedures. The overall fleet strategy warrants a more in-depth review that is currently being conducted by Mercury Associates, Inc. (Mercury), an independent fleet expert.

### Areas of Excellence

None observed as PA's focus in this area was limited to performing a high level cost benchmarking.

### Areas of Potential Improvement

- *Fleet Utilization:* PA's benchmarking analysis indicates low levels of fleet utilization.
- *Policies and Procedures:* In general, PA noted inconsistences regarding overall policies in the following areas – maintenance practices, take home vehicles, vehicle sharing, overall fleet equipment classification, and standardization.

### Recommendations and Expected Financial Benefits

PA has one process and one policy-related recommendation in the Fleet area which is expected to result in approximately $346,000 in annual Operations & Maintenance (O&M) savings through improved productivity. It is recommended that these proposed resource reductions or re-directions can be managed in a non-disruptive manner over an 18-month period.

NPV is calculated to be approximately $2.3 million under the following assumptions:

– Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.

- Benefits accrued between January 1, 2015 and December 31, 2019.
- One time sale of vehicles will result in $750,000.
- Discount rate of 5%.
- Inflation rate of 2.5%.

**Table 28: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Rationalize vehicles and sell surplus stock | Policy | $750,000 in one time revenues. |
| 2 | Avoided maintenance costs due to reduced fleet size | Process | $75,000 in annual avoided maintenance savings. |
| 3 | Improve maintenance staff to vehicles ratio | Positions | $271,000 in potential savings through improved productivity. |

## Introduction

The Fleet Management Department is within the Operations Services group at SAWS. It provides vehicles, equipment, and maintenance service for employees. It is also responsible for maintaining the SAWS corporate vehicle pool program. The table below shows the type of equipment owned by DSP and SAWS. It is noted that this count has changed since the beginning of this study as vehicles have been auctioned.

**Table 29: Type of equipment owned by SAWS**

| Vehicle/Equipment Type | # of Units |
|---|---|
| Construction Equipment | 155 |
| Other | 152 |
| Pickup Trucks | 498 |
| SUV's | 140 |
| Trailers | 201 |
| Trucks, HD | 319 |
| Trucks, MD | 18 |
| Vans | 37 |
| Total | 1520 |

There are a total of 51 FTEs responsible for the fleet function. At the time of this study, SAWS had contracted with Mercury to perform a more detailed study in this area. As a result, PA focused primarily on performing the cost benchmarking in this area.

# 7.11 PA Cost Benchmarking

### 7.11.1 Responsibilities and Sub-Process Definitions

The PA Fleet process responsibilities include the following:

**Table 30: PA Fleet process responsibilities**

| Sub-Process | PA Fleet sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Fleet Policy and Compliance | Develop, manage, and maintain corporate fleet policy. Provide all required compliance reporting for fleet activities. Includes vehicle registration and licensing fees, CDL policy, and compliance reporting. | Fleet Management (Operations Services Group) |
| Vehicle Asset Management | Optimize the life cycle costs for each vehicle class or type through acquisition, financing, maintenance, refurbishment, and disposal policies and practices. Manage new vehicle purchases as well as | Fleet Management (Operations Services Group) |

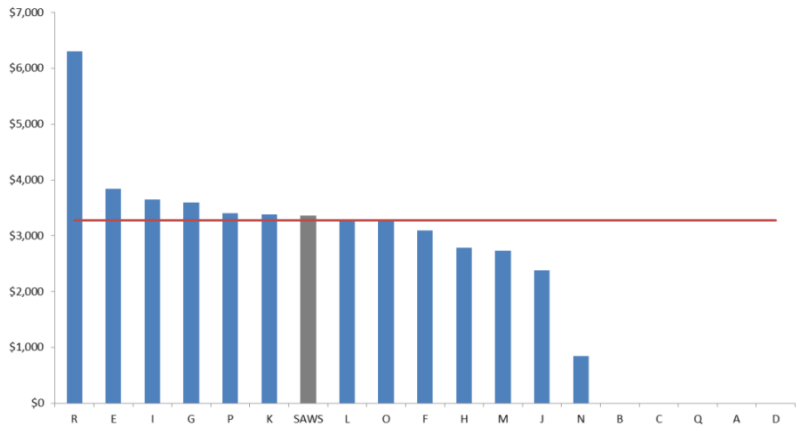
| Sub-Process | PA Fleet sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| | lifecycle impairments. | |
| Vehicle Operations and Maintenance - Routine | Routine operating and preventative maintenance costs, including parts and consumables such as fluids and tires. Boom inspections and testing is included in this sub-process. Vehicle prep for disposal auction done by internal resources is included here. | Fleet Management/ Equipment Maintenance Division (Operations Services Group) |
| Vehicle Operations and Maintenance - Non-Routine/Preventable | Major Repairs and refurbishments (preventable) including parts. This sub-process included accident repair and vehicle/equipment modifications. | Fleet Management /Equipment Maintenance Division (Operations Services Group) |

## 7.11.2 Results

The information below was calculated on the assumption that in the beginning of 2012, there were 1102 vehicles in SAWS' inventory that were classified as heavy or light vehicles, and in total, they drove approximately 8,300,000 miles. Among the 1102 vehicles, 61 vehicles were labeled as new and therefore had no mileage information. The data below does not include the miles or additional vehicles acquired with the integration of DSP. This information was based on a 2012 utilization report.

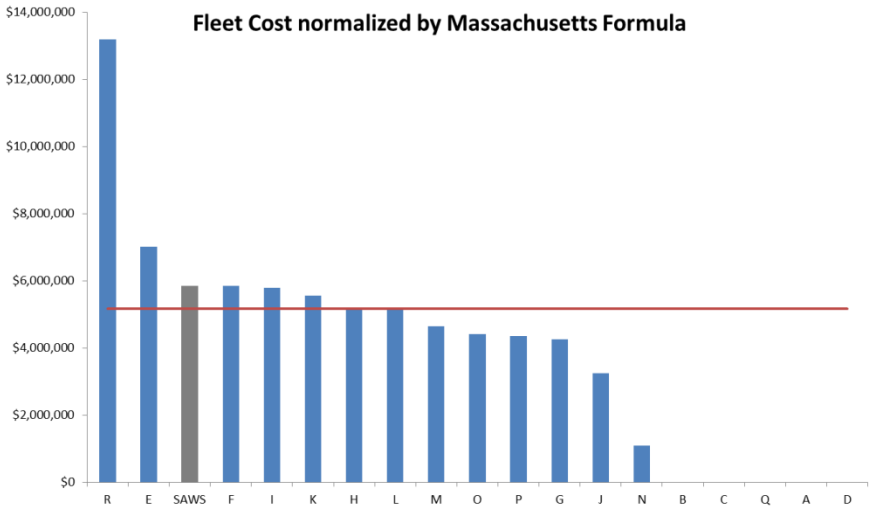
The chart below compares the total fleet cost per FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 30: Fleet cost per FTE**



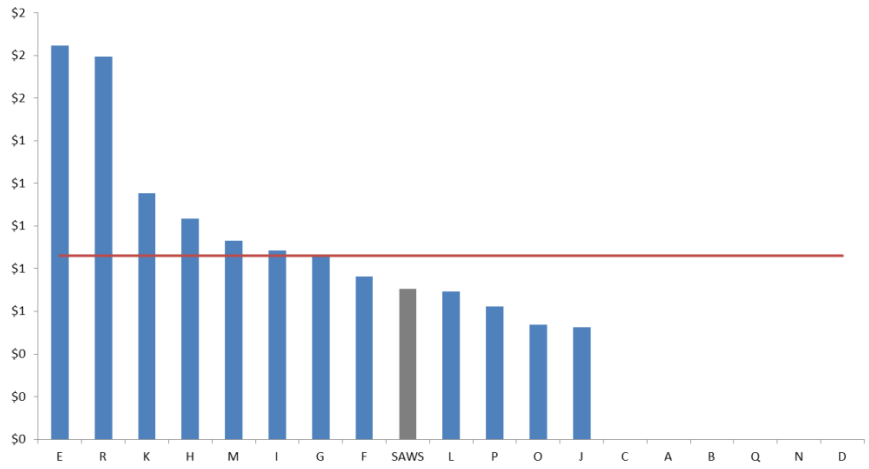

The chart below compares the total fleet cost normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 31: Fleet cost normalized by Massachusetts Formula**




The chart below compares the total fleet cost per mile for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 32: Fleet cost per miles driven**




Based on our analysis, total fleet costs per FTE are at the median whereas when normalized by the Massachusetts formula, costs are slightly higher than median cost values of the PA panel of national utilities. Fleet cost per miles driven is low, however.

## 7.12 Industry Benchmarking

PA did not conduct any industry analysis or benchmarking as SAWS had retained Mercury to perform industry comparisons.

## 7.13 Area Specific Analysis - Vehicle Utilization

Since both the normalized and total costs per FTE were slightly higher than the median values of the benchmark panel, PA analyzed vehicle utilization. There were approximately 22 vehicles in the SAWS inventory that travel less than 100 miles a month. Maintenance costs on these vehicles are also expected to be low.

**Figure 33: Fleet utilization: Total miles travelled per vehicle**

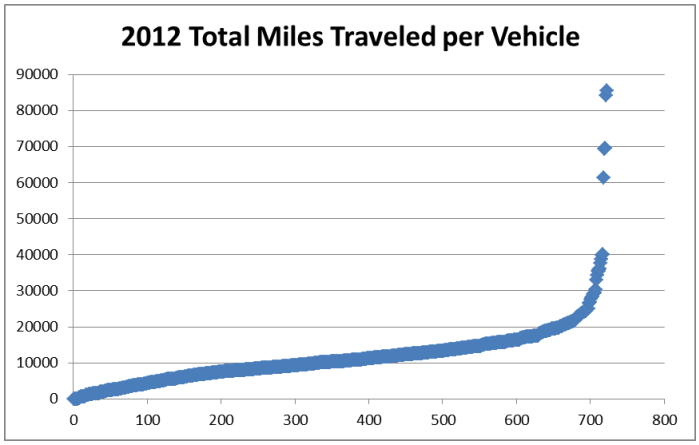
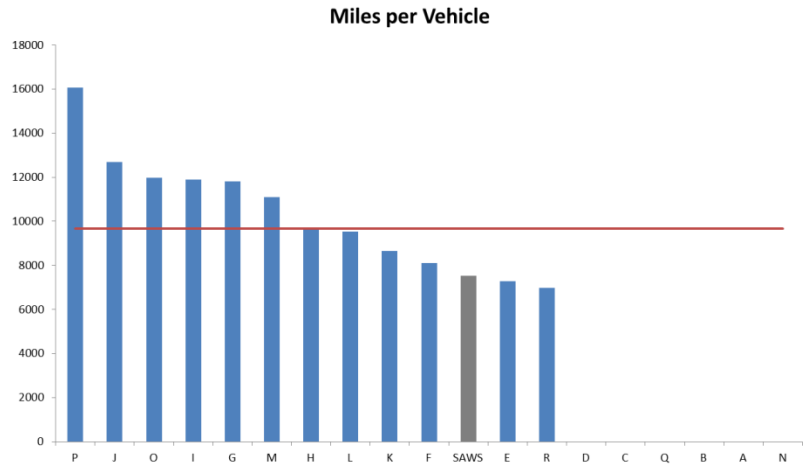



Figure 33 is a visual representation of information found in the 2012 utilization study. The distribution of mileage is uneven; few vehicles are used heavily, while the majority of vehicles were used less than 20,000 miles per year.

Miles per vehicle was below the median level of the PA benchmark panel.

**Figure 34: Miles per vehicle**




## 7.14 Observations

From a cost efficiency standpoint, PA found that SAWS is slightly below median cost levels when compared with the PA panel of national utilities. However, during the interviews conducted, PA made the following observations:

- Fleet Policies and Procedures – The number of take home vehicles was found to be high and there were some inconsistencies around the implementation of policy concerning who is allowed to take vehicles home.
- Fleet Utilization – Qualitative comments around low vehicle utilization supported our data analysis that utilization of the current fleet is ineffective.
- Fleet Standards – There is a lack of standard specs and classification across vehicle types.
- Maintenance and Repair Practices– PA found that there was quite a bit of variance in vehicle maintenance/repair turnaround. Also, all mechanics were of the same pay grade and performed a

variety of tasks, including time spent looking for parts. The number of mechanics per vehicle ratio was also high.

## 7.15 Recommendations and Estimated Benefits

### 7.15.1 Rationalize Vehicles Required and Sell Surplus Stock

Given that 22 vehicles drive less than 100 miles a month, PA has developed the following recommendations.

#### Recommendations

Sell excess vehicles for a one time revenue generation source that would also result in reduced annual maintenance costs. SAWS should also look into policies that would affect car sharing, take home vehicle allowances, and auto reimbursements when rationalizing vehicle inventory.

#### Estimated Benefits

Based on discussions with SAWS staff involved in the Mercury Fleet Study, assuming a sale value of $6,000 per vehicle, the sale of approximately 125 vehicles would result in a one-time value of $750,000. Assuming annual maintenance costs of $1,500 per vehicle, selling 50 vehicles would result in savings of approximately $75,000 in ongoing savings.

PA has not conducted any analysis or quantified any savings associated with the following as they are expected to be covered by Mercury's analysis:

- Assessment of fleet maintenance and repair strategies.
- Review of fleet replacement practices, including determining optimum replacement cycles for selected vehicle and equipment classifications.
- Provision of fleet policy and procedure guidelines.
- Detailed review and analysis of fleet cost and performance.

### 7.15.2 Increase the ratio of vehicles to maintenance staff

SAWS currently has 31 Fleet Maintenance technicians.

#### Recommendations

- Increase the number of vehicles serviced by maintenance technicians by leveraging technology as well as changes to business practices to affect the ratio of vehicles to maintenance staff.

#### Estimated Benefits

The combination of increasing the number of vehicles per maintenance technician, leveraging technology more effectively, and changing certain maintenance policies and procedures is expected to result in approximately $271,000 in annual savings. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

# HUMAN RESOURCES

## Executive Summary

### Overview

The Human Resources (HR) function engages in attracting, training, and retaining a workforce of qualified employees to help SAWS in reaching its organizational goals and mission through a focus on excellence and continuous improvement.

### Overall Observations

With 28 FTEs responsible for human resources related functions, from a cost efficiency standpoint, the SAWS HR department is slightly below median, and compares favorably when measured against the PA panel of national utilities.

### Areas of Excellence

- *Proactively managing challenging Pension, Health and Benefits Issues:* Tuned into key exposure areas for the utility (pension and health benefits) and the need to balance employee and employer interests.
- *High Job Satisfaction:* SAWS has a low turnover ratio, suggesting overall job satisfaction which is consistent with what PA found during our interviews.

### Areas of Potential Improvement

- *Training and Development:* SAWS can improve in performance of this area by delivering more standard training programs to its employees at a reduced cost level by varying the mix of training mediums.

### Recommendations and Expected Financial Benefits

SAWS has retained Aon-Hewitt Consulting, a well-recognized expert in the field of benefits, to assist with evaluating various strategies and options across the range of pension and health related areas, which is positive and consistent with what PA would have recommended. PA has one process and one policy related recommendation in the Training and Development area which is expected to result in approximately $488,000 in annual Operations & Maintenance (O&M) savings through the reorganization of management and staff and examining the group's resources and responsibilities. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period. We have also made three additional policy recommendations that require additional

investments which should be further evaluated by SAWS. These three policy related recommendations have not been quantified in our analysis.

NPV is calculated to be approximately $2.3 million under the following assumptions:

- Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Benefits accrued between January 1, 2015 and December 31, 2019.
- Discount rate of 5%.
- Inflation rate of 2.5%.

**Table 31: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Reduce total training staff across the company | Positions | $384,000 in potential savings through increased productivity |
| 2 | Reduce external vendor spend | Policy | $104,000 in potential savings through course rationalization |
| 3 | Conduct a salary survey | Policy | No benefits quantified – study to be conducted by SAWS |
| 4 | Focus on evaluating employee premium sharing | Policy | No benefits quantified – study underway by SAWS |
| 5 | Evaluate the long-term impact of continuing to offer a defined benefits plan to all employees | Policy | No benefits quantified – study underway by SAWS |

## Introduction

The Human Resources (HR) department engages in attracting, training, and retaining a workforce of qualified employees to help SAWS in reaching its organizational goals and mission through a focus on excellence and continuous improvement. The Department is divided up into four divisions: Training & Development (T&D), Employee Relations and Recruitment, Employee Benefits and Wellness, and Classification and Compensation.

The T&D division is responsible for the following key activities:

- Provide training, learning opportunities and performance solutions to foster and nurture individual and organizational effectiveness.
- Develop and provide customized training that meets organizational needs and promotes effectiveness.
- Offer learning opportunities that meet employee development needs.
- Provide developmental options that help employees accomplish their situational goals.
- Arrange, coordinate, and facilitate training provided by vendors.
- Manage and administer the training budget for the organization.
- Maintain employee training records.

The Employee Relations and Recruitment division is responsible for the following key activities:

- Serve as a strategic partner to assigned business group to maintain employer-employee relationships that contribute to satisfactory productivity, motivation, and morale. Work with management to prevent and resolve problems involving individuals that arise out of, or affect, work situations.
- Provide support in the areas of compliance, Equal Employment Opportunity (EEO), performance management, employee development, and interpretation, guidance and consultation as it relates to HR policies and procedures to multiple business units.
- Responsible for all facets of full cycle recruiting and using both traditional and innovative sourcing strategies and resources.

The Employee Benefits and Wellness division is responsible for the following key activities:

- Administer, analyze, develop, and implement SAWS health, welfare, and retirement benefit programs to meet SAWS strategic goals.
- Provide a competitive and cost effective benefits program to attract and retain a quality workforce.

The Classification and Compensation division is responsible for the following key activities:

- Administer, analyze, develop and implement compensation, classification, and organizational design programs to meet SAWS strategic goals.
- Provide competitive, cost effective, and equitable salary programs, initiatives, and plans.
- Maintain the integrity and functionality of the HR Information System through administrative and technical support, including data entry, analysis, resolution of system issues, and implementation of system changes.

# 7.16 PA Cost Benchmarking

### 7.16.1 Responsibilities and Sub-Process Definitions

The PA HR process responsibilities include the following for benchmarking purpose.

**Table 32: PA HR responsibilities**

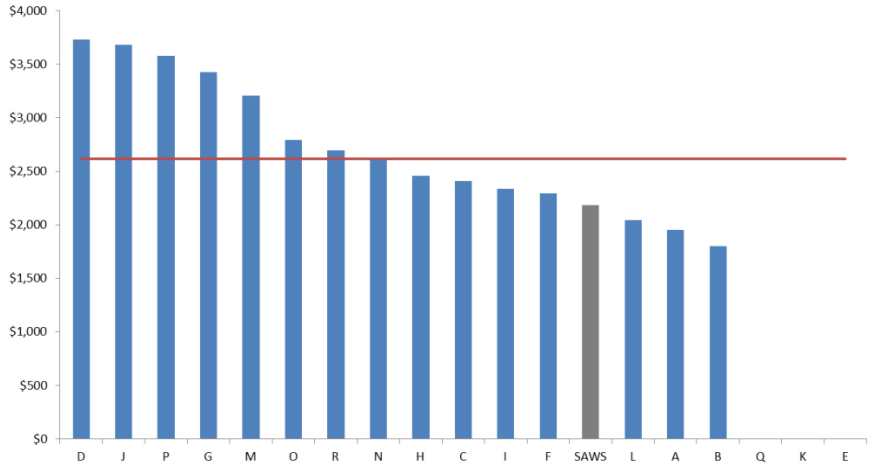
| Sub-Process | PA HR sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Workforce Planning | Forward looking analysis and planning of workforce requirements and composition. Identification of future skill requirements, gaps and solutions to fill those gaps. | Human Resources Department |
| Recruiting + Relocation Costs | Recruitment, screening, and selection of internal and external candidates. | Human Resources Department |
| Compensation | Designing compensation processes for all positions. Includes job evaluations, comparative salary surveys and analysis, annual salary planning, incentive programs, executive compensation, deferred compensation, and any internal or third party administrator costs associated with specific compensation programs, such as deferred compensation plans with notional balances. | Human Resources Department |
| Benefits | Management and implementation of health and life insurance, pension and retirement, reimbursement accounts, and other benefits for all employees. | Human Resources Department |
| Diversity | Diversity and outreach. Includes outreach programs, diversity programs and training, compliance reporting, AA planning, and affinity group support. Includes I-9 audits, OFCCP audits, personnel file, and immigration issues. | Human Resources Department |
| Employee Relations | Resolution of all employee complaints. Includes employee advocacy, investigation of employee allegations/issues, proper resolution of disciplinary matters, internal disciplinary appeals process, and support for legal cases. | Combination of different groups (accounting code 511530) |
| Training and Development | Identification, development, execution and delivery of training programs to enhance the skills and capabilities of the workforce.<br>Includes development and execution of programs to enhance leadership skills and development. | Human Resources Department<br>Quality and Manager Training (Customer service) |
| Human Resources Process & Technology (HRPT) and Employee Information Management | Provide support on HR technology and HR processes. Includes HR technology strategy/solutions, corporate/ad hoc reporting, data analysis, data integrity and oversight, and system testing. Includes process management. Include HRIS employees who report to Information Services (master data management). Includes talent management costs. Centralized data management for Human Resources information. More specifically, employee and non-employee updates for (personal data changes, job/pay changes) management of HR systems. | Human Resources Department |
| Talent and Performance Management | Talent management programs and solutions. Includes succession planning, performance management, career development, mentoring, executive coaching, career planning and development, and | Human Resources Department |

| Sub-Process | PA HR sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| | employee/organizational assessments. | |
| Medical Services, Worker's Compensation and Short Term Disability | Medical Services includes:<br>-Management and oversight of all regulated and Medical examination programs company required and / or federally mandated<br>-Costs for CDL and mobile equipment physicals, drug & alcohol testing, and Employee Assistance Programs.<br>-Costs for Medical Exams, non-regulated exams (including executive physicals, return to work, industrial treatment, travel immunization, fit for duty, pre-placement, etc.)<br>-Costs for ADA accommodations, and medical emergency plans<br>-Costs for injury prevention<br>-Cost for general medical administration and services such as company nurse and or health clinic<br>-Include FMLA administration and compliance costs<br>-Absence management, i.e. monitoring sick time usage patterns, FMLA administration, light duty programs, disability, etc.<br><br>The Worker's Compensation sub-process includes:<br>-Management and administration of all worker's compensation programs, whether self-administered or administered by a third party<br>-Worker's compensation insurance premiums, if any, AND cost of claims for self-insured programs and insured programs with a deductible.<br>-Costs for any medical services for Workers Compensation cases required by the company, such as second opinions, consultations, etc.<br>-Costs for workers compensation case management<br>-Costs for investigations of worker compensation claims<br>-Costs for legal services, whether internal or external, related to worker's compensation cases | Human Resources Department<br><br>Claims (Legal Dept)<br><br>Safety |
| HR Business Partners | HR Business Partners performs generalized human resources consultation and support to specific business units leaders. They perform generalized human resources consultation and support. They provide client facing management support to teams within the business with regards to HR guidelines, policies, programs and tools to better manage their human capital. These employees provide day-to-day operational and strategic support. Services are generally delivered in conjunction with other HR staff resources to meet individual business unit requirements. | Human Resources Division |
| Employee Engagement | Employee Engagement measurement (including tools such as Gallup) and reporting, including program management thereof, as well as supervisor and employee training in the interpretation and use of the results. | Human Resources Department |

## 7.16.2 Results

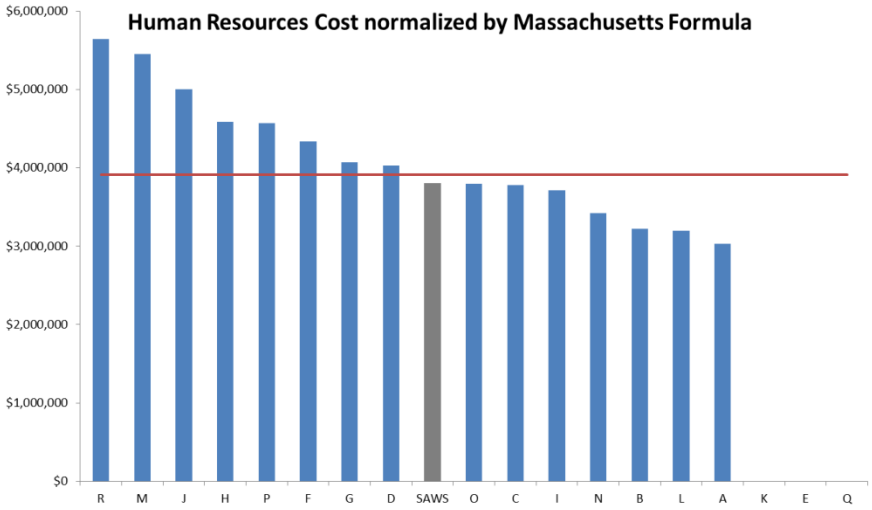
The chart below compares the total cost of providing HR related functions per FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 35: Human Resources cost per FTE**




The chart below compares the total cost of providing HR related functions normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 36: Human Resources cost normalized by Massachusetts Formula**



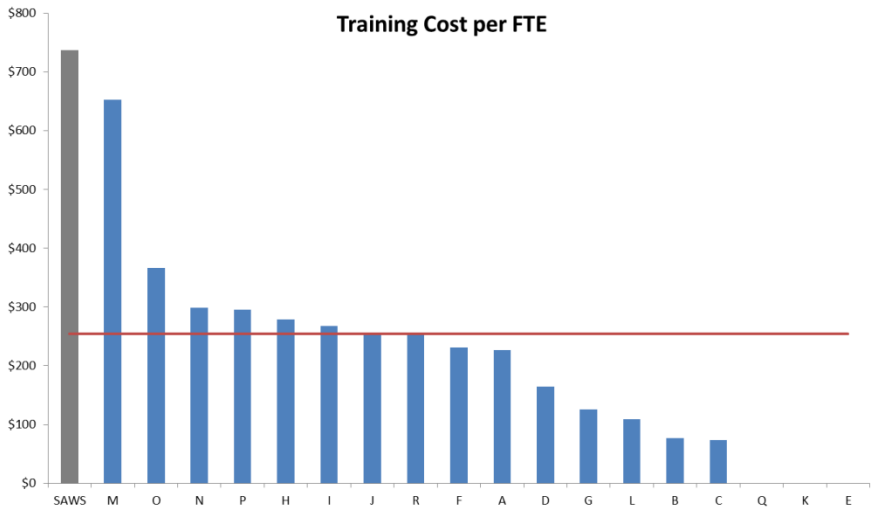

Based on our analysis, total HR costs both per FTE as well as normalized by the MA formula are below median values of the PA panel of national utilities.

During the interviews conducted by PA, we found that training was a large cost of the Human Resources budget. Below are results from costs in the T&D Division, and a small fraction of the Manager Quality and Training Division in the Customer Service Department.

When only the T&D sub-process is compared for all utilities, SAWS spends more than twice the median on training per FTE.

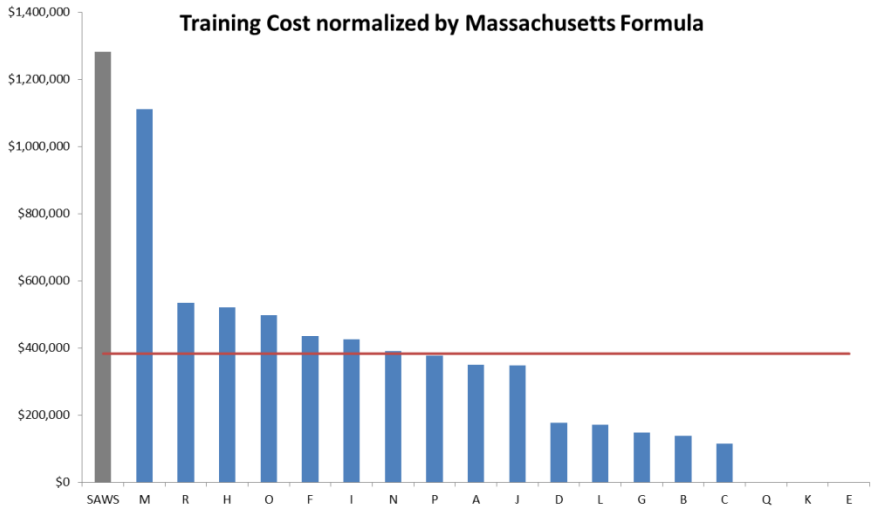
The chart below compares only the training costs per FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 37: Training costs per FTE**




The chart below compares only the training costs normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 38: Training costs normalized by Massachusetts Formula**




It should be noted that these are dollars spent based on 2012 budgets, and since then, there have been reductions in the training staff.

## 7.17 AWWA Benchmarking

The chart below shows data from the Organizational Development benchmarking results from the 2011 AWWA Benchmarking Performance Indicators Report.

**Table 33: Organizational development benchmarking results**

| SAWS Score | Ranking | Area of Evaluation | AWWA Top Quartile | AWWA Median | AWWA Bottom Quartile |
|---|---|---|---|---|---|
| 5.98% | Median-Top | Employee Turnover Rate | 6.49% | 8.49% | 12.60% |
| 30% | Bottom | Retirement Eligibility | 13% | 17% | 28% |
| 30 | Top | Training Hours Per FTE | 27 | 19 | 11 |

### 7.17.1 Employee Turnover Rate

SAWS has a low turnover ratio, suggesting overall job satisfaction which is consistent with what we found during our interviews.

### 7.17.2 Retirement Eligibility

Retirement eligibility at approximately 30% indicates that approximately a third of the total SAWS workforce is eligible to retire indicating the need for strong knowledge transfer and succession planning programs. There is also potential to realize financial benefits by managing the business around attrition where appropriate (i.e. not filling positions when certain employees retire). Further analysis is needed for each department to predict where and when retirements are expected and target process changes to maximize resources prior to replacing all vacancies.

### 7.17.3 Training Hours Per FTE

With respect to training hours per FTE, high (top) is not necessarily good. High training hours is indicative of over-spending and high training-associated administrative costs. This result is consistent with the other observations around high training cost.

## 7.18 Area Specific Analysis – Salaries and Benefits

Staffing costs, including wages and benefits, account for about half of SAWS' budget annually. These costs are primarily driven by number of FTEs, salaries/wages and cost of benefits. An overview of recent years' spend on salaries and benefits is shown below.

**Table 34: 2010-2013 FTEs, Salaries, and Benefits**

| Description | 2010 Actuals - SAWS | | 2011 Actuals - SAWS | | 2012 Actuals - SAWS | | 2013 Budget - SAWS | |
|---|---|---|---|---|---|---|---|---|
| FTEs | 1647 | | 1669 | | 1748 | | 1752 | |
| Average Salary | $ 48,187 | | $ 47,856 | | $ 45,543 | | $ 47,223 | |
| ***Average Salary Increase/Year*** | ***$ 3,333*** | ***6.9%*** | ***$ (330)*** | ***-0.7%*** | ***$ (2,313)*** | ***-5.1%*** | ***$ 1,679*** | ***3.6%*** |
| Average Salary-Loaded | $ 73,784 | | $ 76,582 | | $ 71,679 | | $ 74,472 | |
| ***Average Salary Increase/Year*** | ***$ 5,873*** | ***8.0%*** | ***$ 2,798*** | ***3.7%*** | ***$ (4,904)*** | ***-6.8%*** | ***$ 2,793*** | ***3.8%*** |
| Salaries | $ 79,363,373 | 100% | $ 79,872,007 | 100% | $ 79,609,587 | 100% | $ 82,734,227 | 100% |
| Incentive Pay | $ 287,572 | 0% | $ 318,967 | 0% | $ 286,686 | 0% | $ 296,194 | 0% |
| OT and On-Call Pay | $ 2,749,353 | 3% | $ 3,554,211 | 4% | $ 3,475,463 | 4% | $ 2,738,201 | 3% |
| Fringe Benefits | $ 39,122,322 | 49% | $ 44,070,978 | 55% | $ 41,922,984 | 53% | $ 44,706,484 | 54% |
| Salaries and Fringe Benefits | $ 121,522,620 | 153% | $ 127,816,163 | 160% | $ 125,294,720 | 157% | $ 130,475,106 | 158% |

Note: Based on the Income Statement data provided by the Controller

For the last several years (since 2011), including 2013 budgeted numbers, there are several areas to note:

- *Number of FTEs:* Budgeted headcount has increased by 83 FTEs, or 5%, over the three year period. Actual headcount is actually less than this, however. This 5% increase is based on 2011-2012 actual filled positions versus 2013 budgeted positions. SAWS fully budgets for all positions. However, due to natural turnover and the time necessary to fill vacancies, actual spending for filled position counts can be less.
- *Average Salary:* Average salary per employee in FY 2012 was $45,543 at SAWS. According to the Bureau of Labor Statistic (BLS) data, the median salary in San Antonio was $45,768 in calendar year 2012, which indicates that average salary levels are aligned closely with the BLS data. Average salary has also increased modestly by only 1% over the three year period. The combined impact of the head count and average salary increase has been about a 4% increase in salaries. While the overall increases in these areas have been modest, a review of many of the departments revealed opportunities for staff optimization as detailed in other sections of our report
- *Salary Review:* The last comprehensive review of SAWS' pay scales was completed over five years ago in 2008 by Mercer Group. Based on that review, salaries and pay scales were adjusted that year and in 2009, the adjustments resulted in an average market-based increase of approximately 7% salaries at that time. Since then, SAWS has annually awarded performance-based pay increases in line with cost of living changes (SAWS does not grant automatic cost-of-living adjustments). Since 2008, SAWS has utilized local and national surveys to calibrate salaries and pay scales on an ad-hoc basis, based on benchmarks established as part of the Total Rewards compensation system at SAWS.
- *Overtime:* Overtime in the range of between 3 and 4 percent is very good and is indicative of good management practices.
- *Benefit Plan Contributions:* Since 2010, SAWS has implemented successive changes to its employer-subsidized health plans, including increased cost-sharing by employees/retirees and increases in co-pay, deductibles, and out-of-pocket expenses. These changes have curtailed benefits costs, which decreased as a percentage of salaries by 1% over a three year period, from 55% of wages, or $44 million, in FY 2011 to 54% of wages, or $44.7 million, in FY 2013. SAWS has managed its benefits costs well. Despite double-digit increases in costs of healthcare costs nationally, SAWS has been able to limit its growth to a very modest level. Pension and retirement costs have decreased from about 44% of wages, or $40 million, in FY 2011 to 45% of wages, or $36.9 million, in FY 2013. SAWS has engaged Aon-Hewitt Consulting to conduct a review of its pension system – this study is underway with recommendations expected in September 2013.

## 7.19 Observations

From a cost efficiency standpoint, the SAWS HR function is slightly below median, and compares favorably when measured against the PA panel of national utilities.

- Overall Cost – At a per FTE level as well as after normalizing SAWS costs, PA found total human resources costs to be lower than the median level of the panel of national utilities in the PA database.
- Salaries – Although overall average salary is consistent with BLS data, the last comprehensive review of SAWS' pay scales was completed in 2008 by Mercer Group.
- Fringe – SAWS recognizes the challenges that it has in this area and is taking steps to increase employee premium sharing.
- Pension – SAWS has engaged Aon-Hewitt Consulting to conduct a review of its pension systems.
- Overtime – Company-wide overtime between 3 and 4 percent is excellent.
- Training and Development – SAWS can improve in this area by delivering more standard training programs to its employees at a reduced cost level by varying the mix of training mediums.

## 7.20 Recommendations and Estimated Benefits

### 7.20.1 Re-evaluate Training Strategy and Spending

In 2012, SAWS paid vendors to deliver 294 courses at a cost of $344,949.

SAWS currently has 5 trainers in T&D within the Human Resources function and 3 trainers in Customer Service for a total of 8 trainers. Trainers in Human Resources are responsible for training across the company while the 3 trainers in Customer Service are specifically dedicated to Customer Service employee training.

#### Recommendations

PA recommends reducing total SAWS training staff (T&D and Customer Service) to a higher ratio of employees served. PA also recommends SAWS evaluate its policy around utilizing external trainers. SAWS needs to assess external training spending by evaluating a detailed breakdown of the vendor-led courses in order to gain an understanding of the type of training the external vendors are conducting and how much of it is regulatory, requires external subject matter expertise, or requires yearly updates or certification needs. In-house trainers also give SAWS the added benefit of knowledge transfer, which is a concern with an aging workforce. In order to fully leverage the use of e-learning, we highly recommend that SAWS design training curriculums per level or career path, versus on an ad-hoc basis, which is most likely adding additional costs.

#### Estimated Benefits

The combination of increasing the number of employees per trainer, designing more appropriate course curriculums by department or level, and more effectively utilizing e-learning and external vendor training is expected to result in approximately $488,000 in annual savings. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

### 7.20.2 Conduct a Salary Survey

It has been nearly five years since SAWS conducted a formal salary survey.

#### Recommendations

PA recommends that SAWS complete a new salary benchmark/survey to determine if salaries are market-competitive, and take necessary actions to adjust salaries and pay ranges as a result of this analysis. We

also recommend that SAWS periodically undertake such a survey to ensure continued alignment to market salary rates.

### Estimated Benefits

It is difficult to determine prior to having the results of the survey whether the salaries, especially in certain areas and bands, are above or below the median levels and the effect on overall salaries paid by SAWS.

## 7.20.3 Focus on Evaluating Employee Premium Sharing

SAWS is currently increasing employee premium sharing so that employees hired prior to 2012 will pay 20% of overall costs by 2015. Employees hired after 2012 are already paying 30% for their benefits plans, and in 2013 SAWS added a high-deductible PPO plan as a low-cost alternative for employees and retirees.

### Recommendations

PA recommends that SAWS continue to proceed methodically evaluating optimal benefits options for its employees while balancing costs. With approximately a third of the SAWS workforce eligible for retirement, there is a risk that being too aggressive in this area could trigger employee retirements and so SAWS needs to undertake a holistic salary and benefits strategy that protects both employee and business interests.

### Estimated Benefits

Given that SAWS is currently evaluating various strategies and scenarios in this area, PA has not quantified any resulting benefits with respect to changes in employee premiums.

## 7.20.4 Evaluate the Long Term Impact of Continuing to Offer a Defined Benefits Plan to All Employees

Defined benefits plans (pension plans), such as the one offered by SAWS, are typically more expensive than defined contribution plans. Therefore, many utilities and municipalities are moving away from offering such plans or are offering hybrid plans for new employees at a minimum. The increased cost of a defined benefit plan is typically attributed to higher administrative costs, longevity (retired employees are living longer), and volatility (employer bears the risk of market fluctuations and asset value changes).

### Recommendations

SAWS is working with a recognized expert in this field, Aon-Hewitt Consulting, to analyze potential changes in this area. It would be prudent for SAWS to consider any changes that lessen risk while maintaining a competitive retirement benefit for future employees.

### Estimated Benefits

Given that SAWS has undertaken detailed due diligence of this area with Aon-Hewitt Consulting, PA has not quantified any resulting benefits in this area as the study is expected to cover that more comprehensively.

# INFORMATION SERVICES

## Executive Summary

### Overview

The Information Services (IS) department at SAWS is responsible for the bulk of the information technology responsibilities for the organization. In addition, some of the responsibilities for SCADA maintenance are managed by the Operations group and aspects of Geographic Information Systems) GIS are split with Engineering and Construction.

### Overall Observations

With 70 FTEs responsible for IS related functions, from a cost efficiency standpoint, the SAWS IS department is significantly below median, and compares favorably when measured against the PA panel of national utilities. While on the one hand, this can be interpreted as being highly efficient, it also causes concern. In our experience, the impact of underfunding certain aspects of shared services, especially IS, often manifests in challenges and a drag in productivity in other parts of the enterprise.

Given the acute difference of SAWS IS spending from the median values, PA conducted additional benchmarking in this area, at a sub-process level, to investigate if the underfunding was across all areas of if there were a handful of sub-processes that were significantly underfunded. We found that except in a few areas where the spending appears to be reasonable and in line with median cost levels, there is significant under-spending across the majority of sub-processes.

We also noted that although the Board Strategic Plan identifies several aspirational goals for IS, there was no formalized IS Strategic Plan or IS Applications Roadmap beyond the Enterprise Resource Software System (ERSS), the Sanitary Sewer Inspections (SSI) programs, and the ten-year SCADA master plan to guide the organization in meeting these goals. The absence of such documents leaves IS vulnerable to making short term decisions which might have significant cost implications in the long run and/or increase risk and vulnerability of the organization.

### Areas of Excellence

- *Excellent Levels of IS Availability and Reliability:* From an infrastructure standpoint, the IS function provides technology support to the rest of the business at excellent levels of reliability, availability, and security.

## Areas of Potential Improvement

- *Data Management and Reporting:* It is not clear to PA if it is a cultural issue across the organization or the enabling nature of the technology infrastructure in place, but SAWS could certainly improve on its data management and reporting capabilities. The sheer number of systems in place combined with compartmentalizing of information highlights a need for better data management principles across the company and supported by all levels of SAWS leadership.
- *Need for Strategic View Versus a Tactical Approach for non-CIP work:* A key driver and catalyst for leveraging efficiencies is technology and information systems. Studies reveal that the most successful companies in every industry are companies that effectively utilize and deploy information systems to improve business processes, ensure employee accountability, and provide meaningful business data to ensure intelligent and informed business decisions in order to deliver customer satisfaction. This is only possible if the enterprise takes a strategic view of its in-place applications and technology infrastructure, not simply a tactical view of going from one deployment to the other based on annual funding in the budget cycle.
- *Contractors filling in as full-time employees:* High costs are associated with using contractors, sometimes on the order of two to three times the cost of a full-time employee. Moving towards reducing contractor labor costs will reduce overall costs and allow for the reallocation of budgetary resources to fill other vacancies.
- *Governance and Program Management Office (PMO):* Overall governance outside of the main Programs (ERSS, SSI, SCADAMASTER) needs to become more effective, especially as it applies to the strategic view discussed above. The base blocking and tackling of PMO is being covered effectively, albeit without as many permanent staff members as required, using contract resources. The practices, tools and artifacts for PMO are being performed and have allowed SAWS to successfully implement on time and on budget more than a dozen applications over the last several years. The only application which has been elusive has been the Customer Billing System, which accounts for about $14 million of the $34 million Enterprise Resource Planning (ERP) solution, the rest of which was implemented successfully. The reason the CIS system has not yet been implemented is due to the lack of a product until this year.

## Recommendations and Expected Financial Benefits

While PA has made recommendations in this area which should result in financial benefits, our focus is not so much on the efficiency aspect of this function, but rather on the overall effectiveness of this function. PA recommends that SAWS retain an independent expert to conduct a focused due diligence of this area to identify strategic needs and planning documents, resourcing structure and requirements, and develop a clear understanding of long-term funding requirements that clearly focuses on capital projects that support the operating utility. The due diligence should also consider other IS-related activity not presently managed under IS, such as GIS applications development and related technologies, to determine optimal management structure.

PA has policy related recommendations in this area which are generally expected to result in approximately $1.3 million in annual Operations & Maintenance (O&M) savings through the elimination of contract staff resource responsibilities at the end of their current tenure.

NPV is calculated to be approximately $5.6 million under the following assumptions:

- Steady state timeframe of January 1, 2015 assuming that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Benefits accrued between January 1, 2015 and December 31, 2019.

- Assumes an investment of approximately $300,000 for external experts to assist with the development of an Applications roadmap, Key Performance Indicators (KPIs) and overall organization architecture.
- Discount rate of 5%.
- Inflation rate of 2.5%.

**Table 35: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Eliminate contractor positions and fill with full time employees | Positions | $981,000 due to replacing contractors with full time employees |
| 2 | ERSS CSS Cobol Support to be removed | Positions | $327,000 due to permanent elimination of personnel |
| 3 | Formalize the IS Strategic Plan and Applications Roadmaps | Policy | No benefits quantified |
| 4 | Formalize IS Governance practices beyond ERSS, SSI, and SCADAMASTER. | Policy | No benefits quantified |
| 5 | Reduce two applications directors down to one application director and switch the other director to a PMO director position | Positions | No benefits quantified |

# Introduction

The Information Services (IS) department at SAWS is responsible for the bulk of the information technology responsibilities for the organization. In addition, some of the responsibilities for SCADA maintenance are managed by the Operations group and aspects of GIS are split with Engineering and Construction.

There are five broad areas that this department focuses on in support of the business.

- The Data Center is responsible for maintaining uninterrupted production support for SAWS, including all aspects of systems administration, database administration, systems software and hardware, the storage area network, and disaster recovery. This area is also responsible for technology policies and procedures, budgets, and contractor management.
- Network Engineering provides continuous network and Internet services, including all aspects of network architecture. Network Engineering is also responsible for all network strategic planning, engineering, operations, security, and network infrastructure services within SAWS. Network Engineering develops plans for the SAWS-wide network, including implementation of short-term project planning and the long-term network road map.
- IP Telephony Systems is responsible for all aspects of the constant telecommunication services/systems functions, including telephone, radio, pager, cell phone, and call center systems for SAWS. This includes design, administration, and analysis of such technologies. Telephony is also responsible for overseeing fiber optic and structured wiring installations for the local area network (LAN) and wide area network (WAN) for both voice and data. This group also reviews and provides specifications for telecommunications and other related products and services for current and future needs.
- Client Services & Desktop Support is responsible for desktop, laptop, and Help Desk support to provide high quality services to the enterprise in support of over 1,700 desktop and laptop computers and associated hardware, software, and peripherals.
- Computer Operations/Print Shop is responsible for overseeing the day-to-day operations of the mainframe computer system as well as all printing and copying services for the organization. Responsibilities include maintaining, upgrading, and supporting all mainframe equipment, all printing equipment, and all copying equipment. Computer Operations is also responsible to ensure efficient and effective output management.

There are three broad areas that this department focuses on that deliver new applications, provide applications support and process improvement.

One Application Director is focused on completing and supporting ERSS. This position is responsible for managing the day-to-day developmental aspects of multiple projects, requirements documentation and analysis, scoping, planning, engineering, integration, conversion, implementation, new product introduction, and portfolio sustainability. ERSS portfolio applications are as follows:

- Customer Information System team (CIS) – Responsible for all functional aspects associated with the successful implementation and support of the new SAWS billing system. Responsible for co-developing, with Infor, the new billing system.
- Hansen – Responsible for maintaining and providing application support for work orders, Community Design and Regulations (CDRs) for the Development Engineering Services division, and Backflow.
- Lawson – Responsible for maintaining and providing application support for Human Resources (HR), Finance, Contracting, and Purchasing.

A second Application Director is focused on implementing applications in support of the Sanitary Sewer Improvement (SSI) program, the Capital Program/Project Management System (CPMS), and SAWS control systems as follows:

- Sanitary Sewer Improvement (SSI): Implement and support the application and data management tools to meet the requirements of the EPA Consent Decree and the SSI program.
- Capital Program/Project Management System (CPMS): Implement and support the CPMS responsible for managing the delivery of capital programs and projects, contract administration, and document management.
- Control Systems: Responsible for the operational and strategic management of SAWS control systems (SCADA/DCS) which monitor and control the production of water, treatment of wastewater, and the delivery of Heating and Cooling services. This group was transferred to IS in February of 2013.

The third area of focus is on the Program Management Office and Data Warehouse/Business Intelligence. The Program Management Office includes:

- Project Management and Program Administration – Responsible for managing projects and providing project support by providing guidance in project management processes and methodologies. Also responsible for developing policies and procedures, planning and budgeting, procurement and vendor relations, board items, payroll, processing invoices, temporary services, and special projects.
- Organizational Change Management – This group is responsible for planning and activity tracking for organizational change management activities. This group is also responsible for information collection and strategy development, communications, and coordinating training activities and documents.
- Business Analysis – This functional area is responsible for developing business requirements and assisting end-users on a daily basis and acts as project subject matter experts, develops As-Is and To-Be process maps, assists with training materials, and participates in special projects.
- Change Control/Testing/Quality Assurance – This area is responsible for defining, developing, and implementing change control practices and procedures, in addition to architecting testing processes, tools, and methodologies for applications portfolios, related upgrades, and hardware platforms across SAWS. They are also responsible for conducting weekly Change Control Meetings where new change requests are reviewed to assess the impact, costs, benefits, risks, and consider approval or rejection of the request.
- Data Warehouse/Business Intelligence is responsible for implementing an enterprise-wide reporting tool for ERSS. The group is also responsible for evaluating reporting requirements including dashboards, report publication, distribution, and archiving.
- This area is led by the Chief of Information Systems and a Project Manager dedicated to the Project Management Office.

## 7.21 PA Cost Benchmarking

### 7.21.1 Responsibilities and Sub-Process Definitions

The PA IS process responsibilities include the following for benchmarking purpose.

**Table 36: Responsibilities and sub-process definitions**

| Sub-Process | PA IS sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Maintenance of the Application | Technical support, problem resolution, application of minor | Applications |

| Sub-Process | PA IS sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Portfolio | enhancements, upgrades and patches. | Directors |
| Data Center Operations & Production Control | Operating and monitoring data center infrastructure and applications, backup and restoration services, change management administration, and batch job management. This includes disaster recovery facilities and the overall disaster recovery plan. Disaster recovery for individual applications is included with each application or piece of infrastructure. This sub-process includes asset management activities for data center assets.<br>Includes: common server & storage support work,<br>e-mail, instant message, Internet content filtering, and user directories. | Data Center |
| Computing Engineering | Designing, testing, implementing, maintaining, monitoring, resolving service problems. | Technology Teams, Applications Directors |
| Process and Project Management | Process development, support and management of methodologies and measurements for effective delivery of business solutions.<br>Includes IS PMO and project management resources for solution and implementation projects. | Applications Directors, PMO |
| Development of Solutions | Designing, developing, testing and implementing new information technology features or functions that provide business solutions and application development. | Applications Directors, PMO |
| Enterprise Architecture | Designing, testing and implementing new information technology standards and tools for computing environments. | Technology Teams |
| Help Desk | Support center interface for end user support. | Client Services – Desktop Support |
| Desktop, Laptop & LAN Services | Installing, maintaining and resolving service problems for end user computing devices, software, LANs and peripherals. This includes:<br>- Lease, maintenance, and support costs for distributed printers and copiers<br>- Costs for network operations such as router & switch support, network monitoring and wired data communication costs<br>- Active Directory and logon script support<br>- Software license compliance activities<br>- Asset management activities for desktop and LAN assets<br>- Network monitoring and control, including network operations center activities. | Data Center, Network Engineering, Desktop Support |
| Business Engagement | Business unit specific relationship management, technology strategy development, information technology business case development and solutions opportunity analysis. | IS |
| Network and | Ongoing security administration including: Identity and Access | Network |

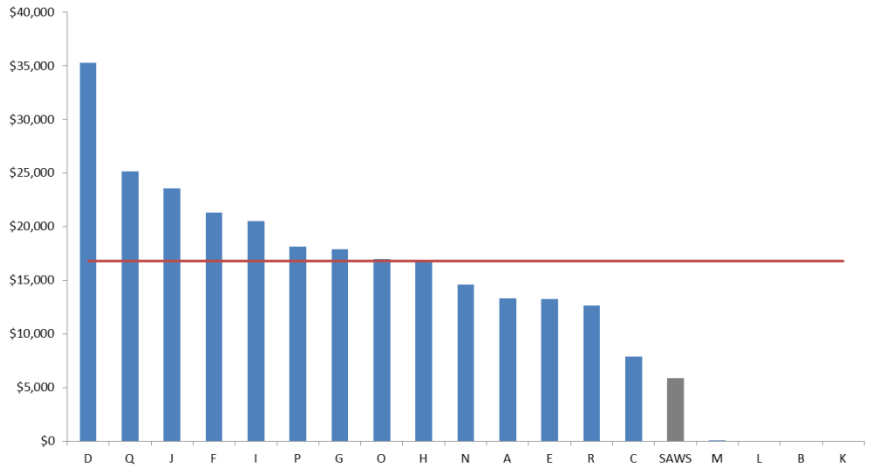
| Sub-Process | PA IS sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Infrastructure Security Administration | Management - user provisioning, access control, monitoring and managing security systems including firewalls, IDS/IPS, and Event management systems, vulnerability management (patching and antivirus administration), etc. Legal Hold activities should be included in this sub-process. This process also includes the installation and ongoing support for security specific hardware and software. Asset management activities for network components installed and supported by this sub-process. | Engineering, Data Center |
| Performance Measurement and Analysis | Performance review and management of core IT processes health and driver metrics, IT Key Performance Indicators (KPIs). These are activities specific to the IT processes. | IS |
| Maintenance of the SCADA System(s) | The architecture, design, implementation, technical support, problem resolution, and application of minor enhancements, upgrades and patches for the SCADA systems. | Production Treatment Operations<br>Applications Director |
| Telecom Usage Charges | Equipment and usage expenses paid to telecom providers for phone, data circuits, internet, etc. This sub-process should INCLUDE WAN costs, whether those WAN costs are external service provider costs or are provided by internal resources. | IP Telephony |
| Provide telephony services | Procure, set-up, install, and maintain telephones, IVR, T1, voicemail and other infrastructure related to desk telephones, and video/audio conferencing. This sub-process should include costs for vehicles used by telecommunications staff. | IP Telephony |
| Provide Wireless Communication Device Services | Procure, set-up, install and support communication devices for cell phones, pagers, smart phones, PDAs, mobile devices & air cards. This also includes usage charges. | Network Engineering, Data Center |
| Provide 2-way radios | Maintaining 2 way radio infrastructure, tower rental, and equipment maintenance. | IP Telephony |
| Cyber Security | Implementing the information cyber security policies and controls development, security solution and architecture evaluation and development, alignment with best practices, and incident response planning, etc. Focused on the technical development and deployment of cyber security policies and controls. Includes new policy development, communications for new or existing security policies, and organizational change management for new and existing security policies. | Network Engineering, Chief of Information Systems |
| POPI - Protection of Proprietary Information | Information Protection - Processes and policies to use traditional (e.g., OPSEC), computer and systems, telecom and electronic (e.g., TSCM) and the processes that identifies critical information and provide selected measures that eliminate or reduce adversary exploitation of critical information. | Security (Operations Services Group)<br>IS |

| Sub-Process | PA IS sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| | Includes: Process for restricting Personally Identifiable Information and restricted customer information. | |

## 7.21.2 Results

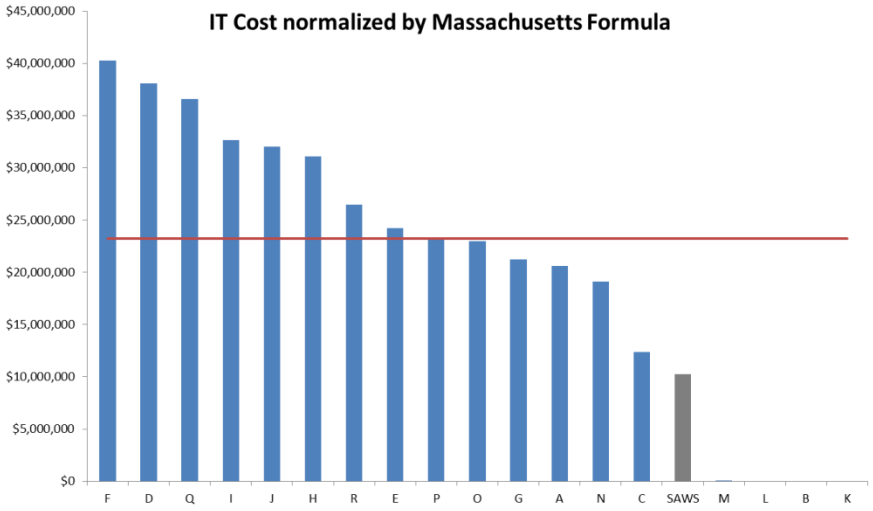
The chart below compares the total cost of providing IS related functions per FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 39: IS cost per FTE**




The chart below compares the total cost of providing IS-related functions normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 40: IS cost normalized by Massachusetts formula**




Based on our analysis, SAWS IS costs are among the lowest when compared with the PA panel of national utilities.

While on the one hand, this can be interpreted as being highly efficient, it also causes concern as in our experience the impact of underfunding certain aspects of shared services, especially IS, often manifests in challenges and a drag in productivity in other parts of the enterprise.

Given the acute difference of SAWS IS spending from the median values, PA conducted additional benchmarking in this area, at a sub-process level, to investigate if the underfunding was across all areas of if there were a handful of sub-processes that were significantly underfunded. The results of our analyses are shown below and we have highlighted those areas where SAWS is closer to reasonable levels of spending:

**Figure 41: IT01 Maintenance of the Application Portfolio normalized by Massachusetts Formula**

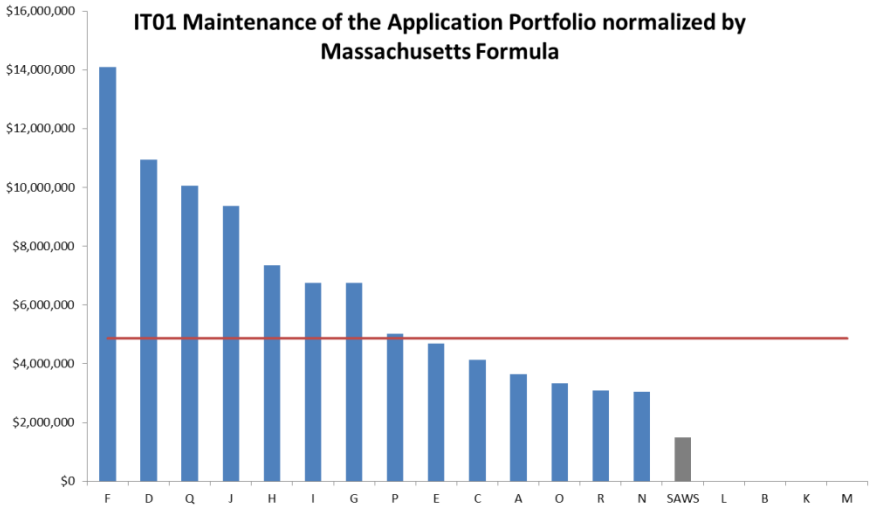
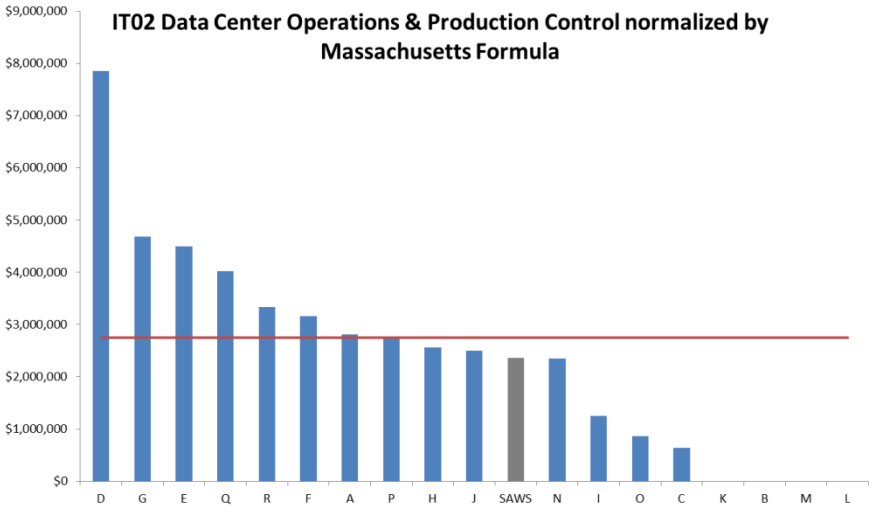
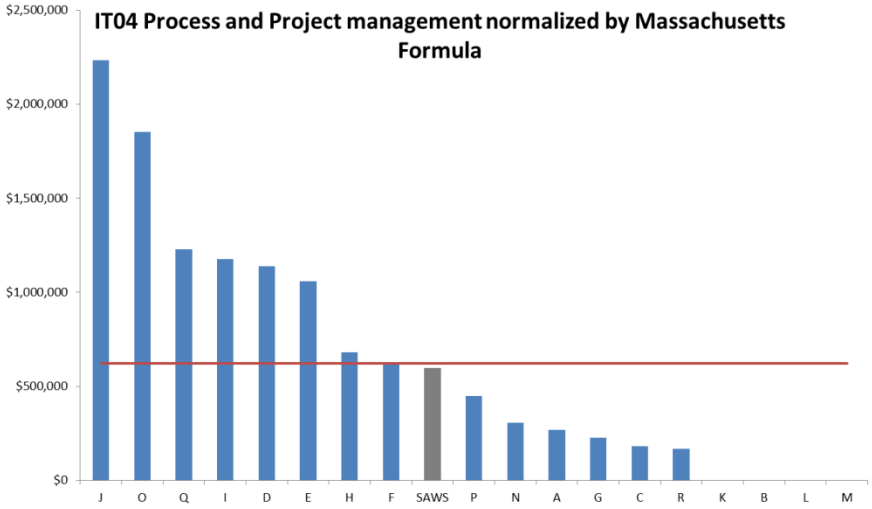



**Figure 42: IT02 Data Centre Operations and Production Control normalized by Massachusetts Formula**




Based on our analysis, in the area of Data Center Operations, SAWS costs are slightly lower than the PA panel of national utilities and appear reasonable.

**Figure 43: IT04 Process and Project Management normalized by Massachusetts Formula**




Based on our analysis, in the area of Project Management, SAWS costs are slightly lower than the PA panel of national utilities and appear reasonable.

**Figure 44: IT05 Development of Solutions normalized by Massachusetts Formula**

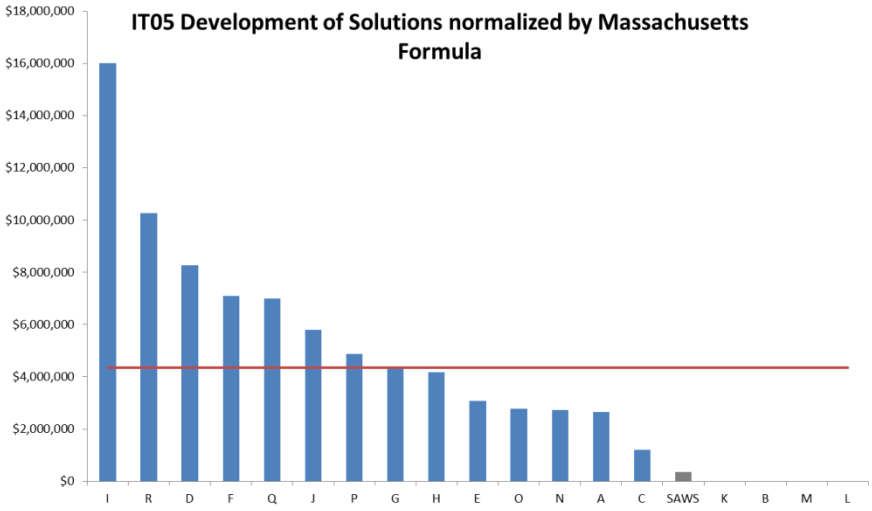


**Figure 45: IT06 Enterprise Architecture normalized by Massachusetts Formula**

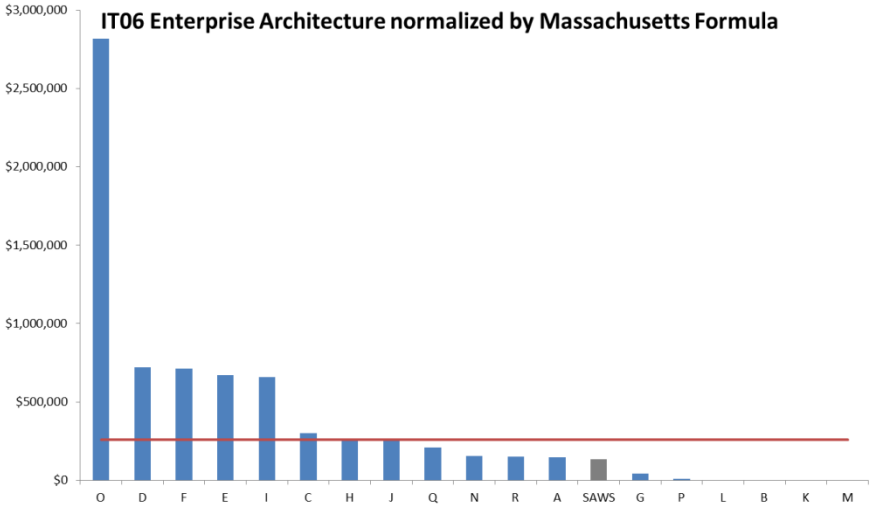



**Figure 46: IT07 Help Desk normalized by Massachusetts Formula**

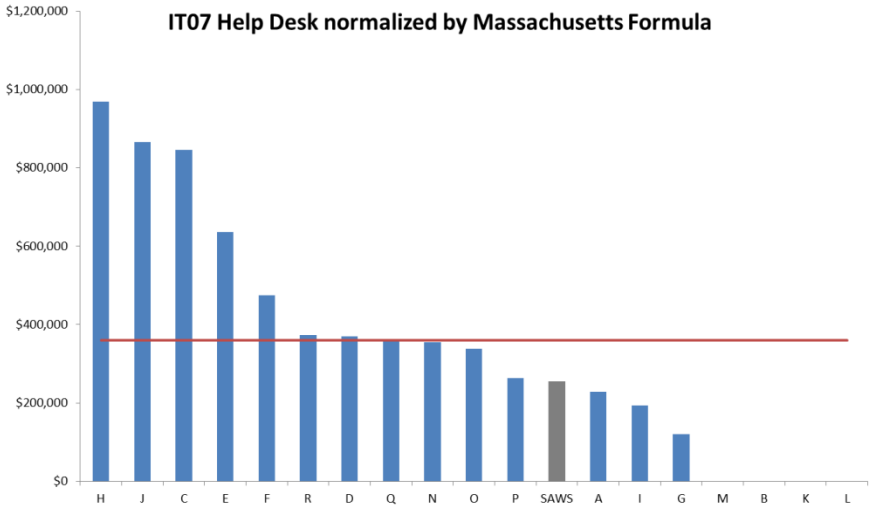


**Figure 47: IT08 Desktop, Laptop and LAN Services normalized by Massachusetts Formula**

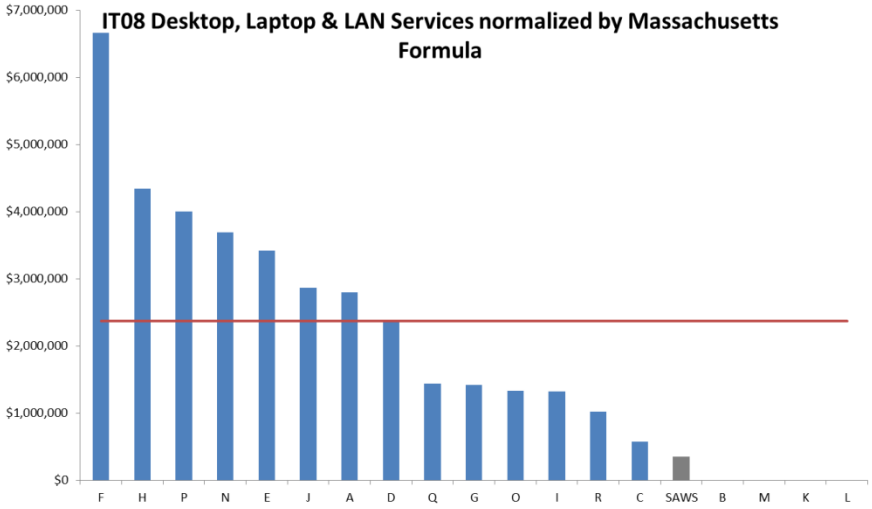



**Figure 48: IT09 Business Engagement normalized by Massachusetts Formula**

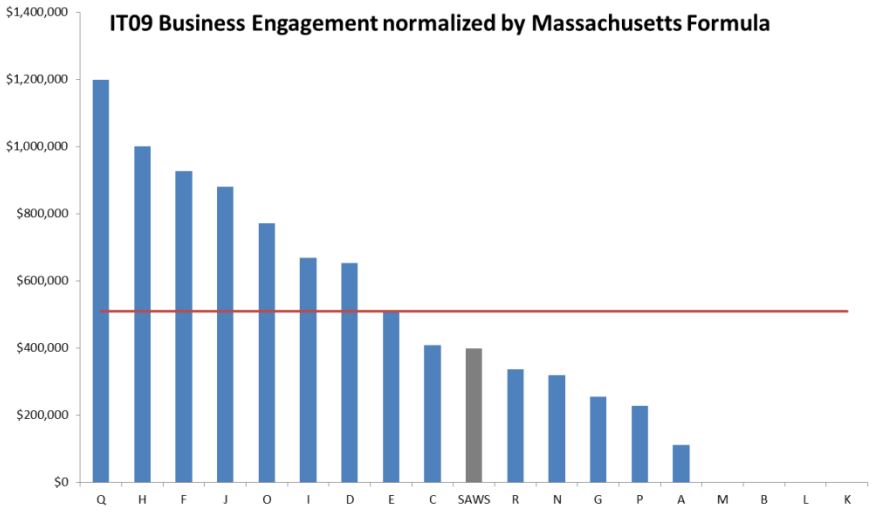
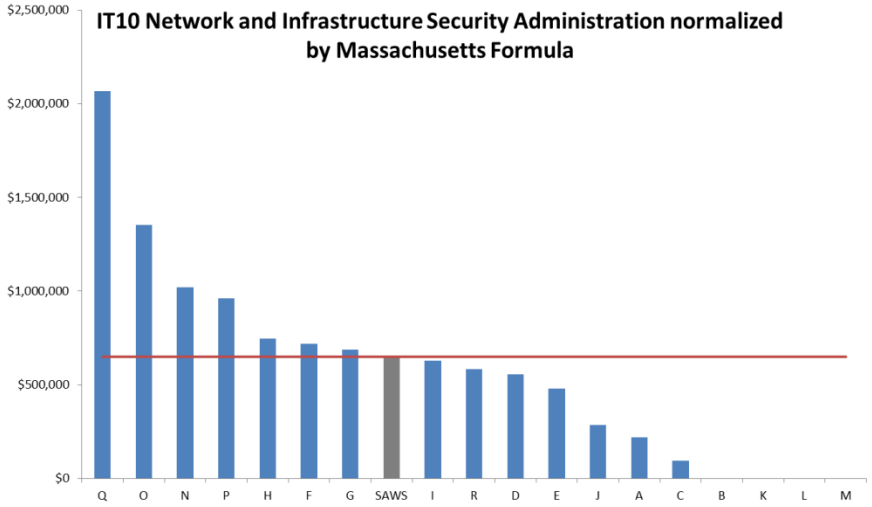


**Figure 49: IT10 Network and Infrastructure security administration normalized by Massachusetts Formula**




Based on our analysis, in the area of Network and Infrastructure Security, SAWS costs are at median cost levels with the PA panel of national utilities and appear reasonable.

**Figure 50: IT11 Performance Measurement and Analysis normalized by Massachusetts Formula**

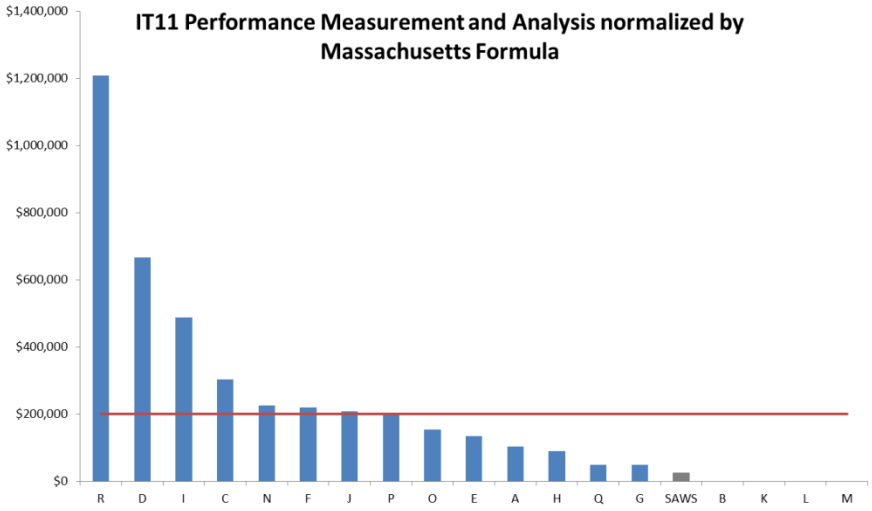


**Figure 51: IT13 Telecom usage charges normalized by Massachusetts Formula**

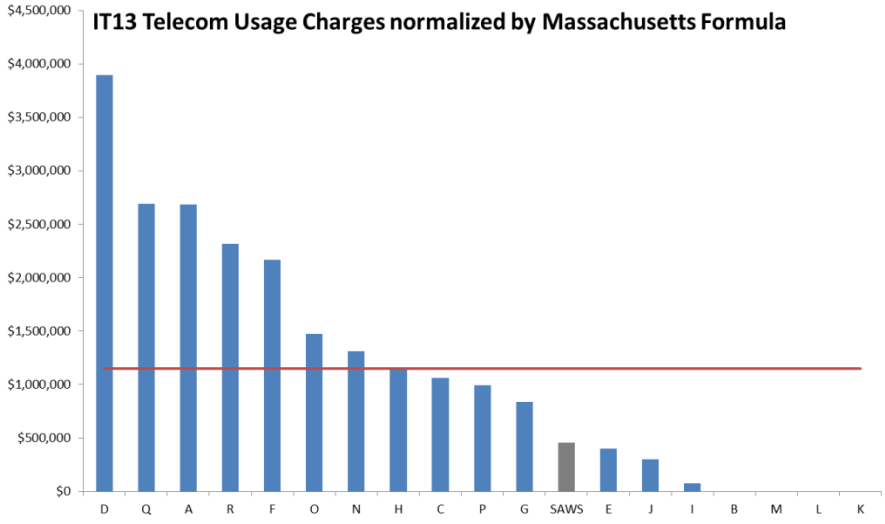
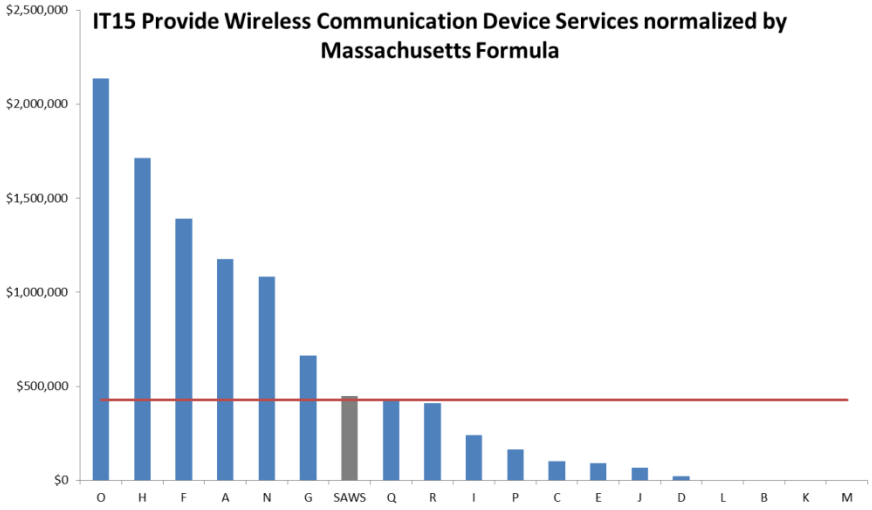
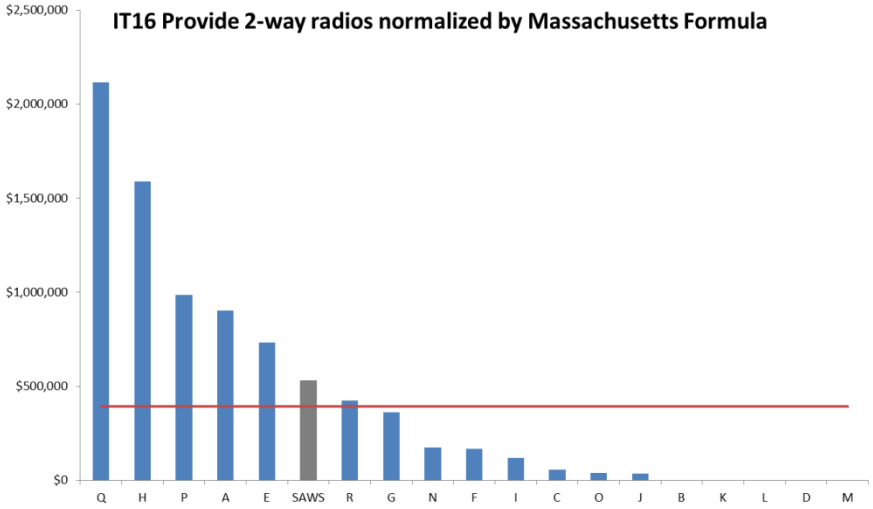



**Figure 52: IT15 provide wireless communication device services normalized by Massachusetts Formula**



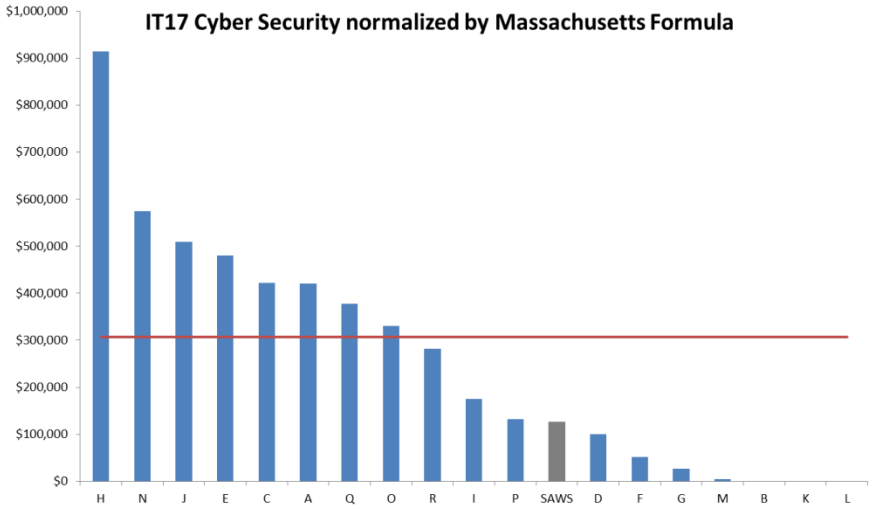

Based on our analysis, in the area of Wireless Communications Device Services, SAWS costs are slightly higher than the PA panel of national utilities and appear reasonable.

**Figure 53: IT16 provide 2-way radios normalized by Massachusetts Formula**




Based on our analysis, in the area of 2-way radio costs, SAWS costs are higher than the median costs of the PA panel of national utilities.

**Figure 54: IT17 Cyber Security normalized by Massachusetts Formula**




As can be seen from the above analyses, except in a few areas where the spending appears to be reasonable and in line with median cost levels, there is significant under spending across the majority of sub-processes.

## 7.22 Area Specific Analysis – Applications and Technology Infrastructure

PA reviewed SAWS' applications topology and found that 29 different systems have been implemented by SAWS since inception. SAWS recognizes that the number of applications at work is rather large and is taking steps to consolidate systems or move towards a common platform. SAWS is evaluating an integrated applications solution strategy based on the Infor product suite. A key assumption for the future is that the Infor product roadmap will align among their multiple solutions and Infor will deliver a single,

fully integrated product. Previously an SAP implementation was attempted and ultimately could not be finished due to poor management. The result was a large write-off, wasted effort, and the continued lack of an ERP system until 2007 and 2008 with the implementation of Infor. Modules which have been implemented include Finance, Procurement, Human Resources and Payroll, Budget and Planning, Work Order/Service Order/Asset Management, and Permitting. SAWS is planning to go live with its Customer Information System implementation in December 2013.

### 7.22.1 Data Center, Active Recovery Center, Storage Area Network, and Database Technologies:

The foundation of the datacenter is built on Cisco UCS virtual servers, the VMware virtualization environment, and NetApp storage. Over 90% of the servers have been virtualized, which has significantly reduced power and cooling requirements. Disaster recovery is handled by an active-active datacenter design that is supported by a near-duplicate backup datacenter connected by redundant high-speed fiber connections. Persistent data availability is attained thru running Oracle Real Application Cluster (RAC) at the primary datacenter and Oracle real application physical standby database at the active recovery center.

### 7.22.2 Network

The network utilizes Cisco Nexus. The WAN provides converged access for mission-critical SCADA devices as well as Closed Circuit Television (CCTV) video surveillance equipment used to secure facilities. Network redundancy and high availability is paramount. The network engineering team maintains network connectivity at over 80 locations which provides access for over 1,800 employees, over 350 security cameras, and roughly 300 SCADA endpoints. Remote sites are connected through leased metro-Ethernet fiber and also tied into the private broadband microwave ring.

Providing secure and seamless network access is accomplished by using Cisco's current generation of NAC, the Identity Services Engine. All internet traffic is filtered and inspected by a series of appliances that are capable of decrypting and intercepting malicious malware payloads.

### 7.22.3 IP Telephony

SAWS employs the Cisco contact center infrastructure (Call Manager and Unified Contact Center Express) which provides multiple channels for customer interaction, either through live agent calling or thru automated service channels using the Cisco Interactive Voice Response (IVR) feature. This is a highly reliable and available suite of technologies which also provides Integrated Protocol Private Branch Exchange (IP PBX), integrated messaging, provides robust reporting features, and simplifies integration with other applications (such as 911 and reader boards).

### 7.22.4 Radios

SAWS has partnered with CPS Energy to use its radio communications network (Motorola Harmony Wireless Radio System). This collaboration provides SAWS field teams' communications as well as interoperability with other municipal and county entities for emergency response.

### 7.22.5 Computer Operations and Print Shop

Although IS Computer Operators currently oversee the operation of an IBM Z800 Mainframe that is about 10 years old, this platform will be replaced by the platform described in the Data Center section above. The new Customer Information System will continue to require Computer Operators to execute batch jobs and interact with the Applications Team. The Xerox DT 128 HLC printers allow SAWS to print water bills in two colors and perforate the bill without having to buy preprinted forms or special stationary.

The Print Shop operates a Xerox Digital Press 700 and a Xerox 4127 printer. This equipment allows IS to satisfy the printing needs of the utility along with an AB Dick 2-Color Offset Press and Xerox Plate Maker for the Offset Press. SAWS prints communication for water customers, internal communication to employees, and business function documents such as budget reports, Board meeting packets, etc.

### 7.22.6 Technology Replacement

Along with staying current on patches (security, operating systems, and firmware), SAWS has instituted replacement rate policies for technology as follows: 3 years for laptop computers, 5 years for desktop computers, and 5 years for other technology such as servers, switches, routers, and network appliances. This replacement methodology enables the reliability, availability, and security IS delivers to the business.

### 7.22.7 Current State of Applications

SAWS current Applications Topology depicts five main applications portfolios with many interface points – Infor/Hansen, Infor/Lawson, the Customer Information System, GIS, and SCADA. There are several specialty applications, some of which will remain interfaced to the main applications portfolios such as IVOS, Kronos, Fleet, EJ Ward, Pipetech, and Energy Management (OEM). Other applications need to be combined into the main applications portfolios over time (LearnFlex, NeoGov, Halogen, Peachtree, COTools, and B2GNow). The Customer Information System will be migrated to the Infor/Hansen platform by the end of 2013. By 2015, SAWS will be positioned to adopt Infor 10, which will merge the Hansen and Lawson portfolios.

## 7.23 Area Specific Analysis – Organization Structure and Staffing

The department performs activities that are consistent with those of any other utility in North America – supporting the technology infrastructure required to deliver service to customers in a cost effective manner. While structurally it appears to be designed in an acceptable manner, the staffing practices are ineffective in the following areas:

- No dedicated resource for overall IS architecture and strategy. While the CIO is ultimately responsible for this role, working closely with other business leaders within SAWS, we observe that this role is often seen as an ad-hoc requirement and not enough attention is paid to this area.
- We find contractors performing a significant amount of work. PA understands that non-CIP contract resources are temporarily funded for backfilling vacancies until resources can be hired. Project Management, Data Architecture, Application Development, and Testing are CIP contract resources.
- The PMO is currently staffed by two SAWS Project Managers (one position is currently vacant and filled by a contractor), one Applications Analyst performing business process re-engineering, and one administrative assistant performing a project specialist role. Other resources are federated among the Applications Teams and the Chief of Information Systems. Given that SAWS is currently undertaking large-scale system improvements, not having sufficient PMO resources significantly increases project risks.
- We also noticed uneven span of control in the department, with one individual having an extremely large group of staff reporting to them.

## 7.24 Observations

From a cost efficiency standpoint, the SAWS IS function is significantly below median when compared with the PA panel of national utilities.

- From the sub-process results, we observe that the areas that were the most underfunded were in managing performance metrics, solution development, cyber security, desktop, and LAN services
  - The fact that SAWS does not use performance metrics other than SLAs for turnaround of tickets for assessing the effectiveness of IS implies that it is difficult to assess which areas specifically need more investment, or which areas are lacking in performance.
  - Solutions development and desktop services internally support SAWS. This finding is aligned with several comments made in the interviews PA conducted, where representatives of different groups raised user-related issues with various technology systems and application packages. Due to the underinvestment in these areas, personnel in other parts of SAWS are sometimes challenged in performing their activities, leading to increased costs in other areas of the utility.
  - Cyber security underfunding places SAWS at risk of compromised data, systems, and services.
- We observed a lack of robust IS Governance, which hinders the ability to obtain sufficient funding for IT initiatives. During the budget approval cycle, IS has to compete with other groups such as engineering to justify and prioritize its initiatives for funding.
- In a utility environment, justifying and prioritizing IS investments together with engineering and other groups often results in under-investment in IS. A level of spending should be determined for IS investments and prioritized according to the Applications Roadmaps and business needs considered in a comprehensive organization-wide governance plan.
- Today, IS has no applications roadmap beyond ERSS, SSI, and the Ten Year SCADA Master Plan to guide its efforts and planning, or to communicate with the business about future direction. The lack of an IS applications roadmap hinders the ability of the business to plan ahead and conduct detailed resource forecasting. This results in IS operating in a tactical mode to respond to business requests, without stepping back to take a comprehensive view of business requirements, future trends and developing a strategy to align delivery to future business requirements.
- A well-defined and agreed applications roadmap will help by providing all stakeholders with a shared understanding of organizational priorities, a vision for the future, and a realistic timeline for achieving this vision. Any roadmap must also be flexible to accommodate changes in the future.

## 7.25 Recommendations and Estimated Benefits

### 7.25.1 Restructure Organization to Focus on Business Needs

The department is organized by functional area, with separate leaders for applications and infrastructure. While this organization structure is quite common, we find that it sometimes hinders organizations from effectively collaborating on projects which require working across groups.

#### Recommendations

PA recommends restructuring the department so that it clearly focuses on three fundamental aspects for SAWS to focus on which are as follows:

- Planning (Strategy and Vision): This area is about engaging with the utility to plan future application implementations. It is typically the job of the Chief Information Officer to proactively engage with SAWS leadership to develop a roadmap of business and technology challenges and opportunities.
- Building (Projects): This group's goal is to deliver projects on time, on budget, and to original requirements. The foundation of PMO is being effectively covered, albeit without as many permanent staff members as required, and using contract resources. The practices, tools and artifacts for the PMO are being performed and have allowed SAWS to successfully implement more than a dozen applications over the last several years on time and on budget. The only application which has been elusive has been the Customer Billing System, which accounts for about $14 million out of a $34

million Enterprise Resource Planning (ERP) solution, the rest of which was implemented successfully. The reason the CIS system has not yet been implemented is due to the lack of a product until this year.

- Running (Applications): This area supports ongoing business needs and "keeping the lights on." Based on our interviews there are several improvements that can be made in this area. These improvements range from a website re-write and integrated voice response configuration improvements that would positively impact the customer experience, to changes to reports, and to development of applications that would positively impact the various business users.

### Estimated Benefits

PA has not quantified benefits in this area. However, PA has assumed an investment of $150,000 for retaining an external expert to assist SAWS with this effort.

## 7.25.2 Develop an IS Applications Roadmap

### Recommendations

PA recommends that SAWS retain an independent external expert to develop an IS applications roadmap beyond ERSS, SSI, and the Ten Year SCADA Master Plan in collaboration with the utility, so that this document can facilitate communications and alignment between IS and the various functional areas.

### Estimated Benefits

PA has not quantified benefits in this area. However, PA has assumed an investment of $100,000 for retaining an external expert to assist SAWS with this effort.

## 7.25.3 Develop Key Performance Indicators (KPIs)

SAWS currently does not have any KPIs in this area beyond KPIs for tickets in the technology teams which measure service level agreements (SLAs) for turnaround.

### Recommendations

- PA recommends that SAWS develop appropriate KPIs that would enable it to manage its technology needs along the three dimensions suggested above. We are also providing some examples of KPIs for SAWS to consider in each area:
- Planning (Strategy and Vision): Internal customer satisfaction, in general, can be measured through standardized annual surveys within the SAWS organization to make sure that the IS department is meeting the needs of the utility.
- Building (Projects): Budget adherence and successful completion rate of projects will indicate whether projects are delivered on time and whether they meet the original requirements.
- Running (Applications): Measurement of an applications' uptime/downtime to monitor the time to restore outages and adherence to SLAs will indicate whether or not the IS department is performing at adequate levels.

### Estimated Benefits

PA has not quantified benefits in this area. However, PA has assumed an investment of $50,000 for retaining an external expert to assist SAWS with this effort.

### 7.25.4 Reduce Two Applications Director Positions Down to One Application Director and One PMO Director

#### Recommendations

SAWS would be better served to move one applications director position and dedicate it to be the PMO director. SAWS should also evaluate the structure of Applications which is currently too flat to be effective.

#### Estimated Benefits

Improved structure of the organization with the PMO Director position filled will yield more control over project management and will enable changes and deployments to be implemented more effectively.

### 7.25.5 Staff Program Needs with Permanent Employees

Program resource needs should be staffed with permanent resources in all four of the above listed roles (Project Management, Data Architecture, Application Development and Testing), utilizing contractors for staff augmentation during periods of high activity.

#### Recommendations

PA recommends that full-time positions currently filled by contractors be filled by full-time employees. There are multiple positions that are utilizing contractors for which SAWS pays a significant premium compared to a full-time employee.

#### Estimated Benefits

Cost reductions of $981,000 are expected to be realized if certain contract positions in IS are converted to full time employee positions. This will also ensure that the function is able to more effectively respond to business needs.

### 7.25.6 Evaluate Customer Service Expertise in IS Holistically with Other Customer Service Changes PA is Proposing

There are 6 Customer Service employees who are part of the Customer Information System team. The first four have been with the project since the team was formed almost 4 years ago and are subject matter experts (SMEs) with the software and functionality, and the last two have been engaged subsequent to the project's initiation for data cleansing. These individuals also continue to provide support to mainframe billing functions and billing operations as well as engage in major initiatives such as the consolidation of BexarMet (about 20% of their time).

#### Recommendations

PA recommends evaluating the suitability of four of these resources as to whether they would be best-suited to reside in the Customer Service area or continue in IS in light of the changes being proposed by PA in Customer Service. The responsibilities that four of these individuals have gained for the duration of the project have trained them to be skilled in the Customer Service Applications Analyst role. They have a solid understanding of the applications and have been responsible for areas such as functionality and configuration, reporting, and data validation.

#### Estimated Benefits

PA has not quantified any benefits in this area as there is a need to rationalize the right type of expertise in both Customer Service and the IS functions. PA assumes that these individuals, based on what we understand of their expertise, are valuable to the organization and will be absorbed in one of the two

areas depending upon management's decision based on changes in the overall Customer Service and the IS functions.

## 7.25.7 Discontinue ERSS CSS COBOL Support

There are two common business orientated language (COBOL) contract resources that are expected to complete their assignments on specific projects in May 2014.

### Recommendations

PA recommends that the ERSS CSS COBOL support positions be permanently removed after mid-2014.

### Estimated Benefits

The removal of these positions is estimated to save SAWS $327,000.

# LEGAL

## Executive Summary

### Overview

The Legal Department is responsible for providing timely and accurate legal services to the Board of Trustees, Executive Management, and other SAWS leadership on all legal matters affecting the utility, including water resources, labor and employment, real estate, general transactional, general litigation, environmental, and public law.

### Overall Observations

With 12 FTEs, including the General Counsel and six lawyers, responsible for core legal services, from a cost efficiency standpoint, the SAWS legal function is slightly below median, and compares favorably when measured against the PA panel of national utilities. The broad scope of work that the group handles spans employment claims to construction contracts to reducing corporate-wide risks and more.

### Areas of Excellence

- *Strategy:* The culture is not based on billable hours, but instead on servicing the customers and the organization's needs. Value is created via the strategy of positioning the department as a partner for the rest of the organization.
- *Quality of Work and Collaboration:* Internal customers are satisfied with the quality and turnaround time of work provided by the Legal group. The Legal department has worked hard with other departments to involve the Legal function when addressing issues that require legal advice.

### Areas of Potential Improvement

- *Development of Key Performance Indicators:* The Department has not implemented operational metrics.

### Recommendations and Expected Financial Benefits

No benefits have been quantified for the policy recommendation related to the Legal function.

**Table 37; Recommendations and expected financial benefits**

| Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Develop a long-term strategic goal, such as Customer Satisfaction metrics, that can be benchmarked and measured going forward | Policy | No benefits quantified |

# Introduction

The Legal Department at SAWS provides expertise on all legal matters affecting the utility, including water resources, labor and employment, real estate, general transactional, general litigation, environmental, and public law. The department is comprised of the General Counsel (Vice President), attorneys, paralegals and a part-time file clerk.

In addition to the above core legal functions, the General Counsel also oversees the following functions, which are covered separately in other sections of the Shared Services chapter.

- Contracting Department – Manages the processing and contracting of all construction, professional and engineering services as well as the Small, Minority and Women Owned Business program. This department also houses Records Management, which manages all SAWS' records in compliance with state mandated retention requirements and responds to all inquiries made under the Texas Public Information Act.
- Claims and Risk Management – The claims department operates as a small insurance office for SAWS, handling General Liability (GL) (Water and Sewer), Auto Liability (AL), Workers Compensation (WC), Time and Materials (T&M), and subrogation claims. The Risk Management department manages all facets of the System's comprehensive commercial insurance program as well as conducting premises risk assessments.

There is very clear identification of attorney specialist areas. The attorney work areas are shown below.

- Corporate:
  - Board Matters (Open meetings, agenda items)
  - Public Finance Transactions (Debt issuance, bond compliance)
  - Bankruptcy Matters
  - Ethics
- Public Law, Rates and Development Services:
  - Development Services Contracts
  - Certificates of Convenience and Necessity
  - Impact Fees/Rates and Ordinances
  - Heating & Cooling/Chilled Water and Steam Agreements
  - Purchasing
  - Customer Service
  - BexarMet Integration
- Contracts:
  - Construction Contracts – Bilateral, Governmental and Interlocal
  - Professional Service Contracts for Construction Projects
  - Consulting Services Contracts
  - Information Technology Contracts
  - Bidding Issues
  - Financial Services Contracts
  - Construction Disputes
- Operations and General Transactional Matters:
  - Corporate Real Estate including right of way acquisition and management and condemnation matters

  - Groundwater Leases and Purchases
  - Employee Benefits
  - Conservation
  - Public Affairs Contracts
  - Energy Related Contracts
- Water Resources:
  - Water supply contracts
  - Regulatory and permitting matters related to Water Resources
  - General Legislative Matters
  - Recycled Water Agreements
  - Litigation related to water resources permits, contracts and related issues
- Compliance:
  - Environmental Matters
  - Regulatory and Enforcement Matters
  - Claims/Disputes/Litigation
  - Resource Compliance
- Human Resources (HR) and General Litigation:
  - Labor and Employment Matters
  - HR matters (other than Benefits)
  - Worker's Compensation
  - Claims Matters
  - Risk Management and Insurance Matters

## 7.26 PA Cost Benchmarking

### 7.26.1 Responsibilities and Sub-Process Definitions

The Legal process responsibilities include the following for benchmarking purposes:

**Table 38: Responsibilities and sub-process definitions**

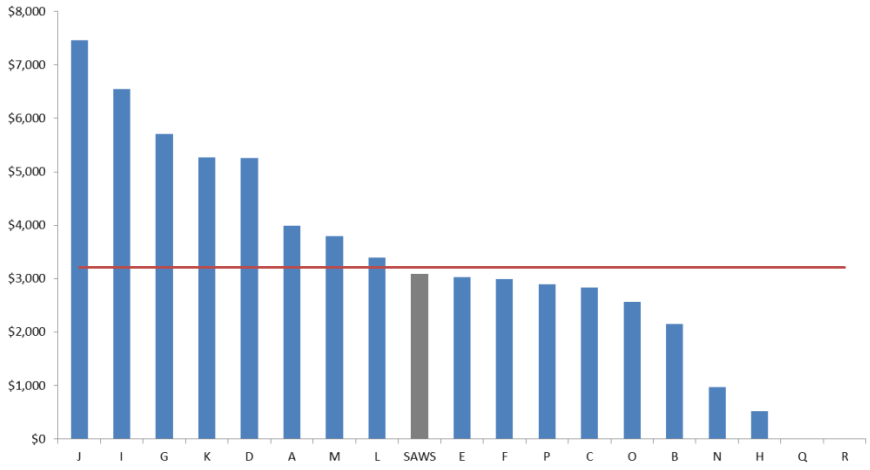
| Sub-Process | PA Legal sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| General Litigation | Handles all matters related to general litigation involving the corporation, including theft of utility service litigation. Tax litigation costs are included in this sub-process. | Legal Dept |
| Corporate Finance (Securities Law) | Handles securities and corporate financial transactions, financial reporting and disclosures, business organizations, mergers, acquisitions and business development, corporate governance, internal controls and risk management, insurance, executive compensation, ERISA and state and federal tax issues in transactions, mergers and acquisitions. Costs associated with disclosures related to executive compensation and ERISA are included in this sub-process. | Legal Dept |

| Sub-Process | PA Legal sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Commercial | Handles commercial and contract law matters for the corporation, including real estate matters. Includes land use permits. The real property matters included within this scope of services will include relocations of utility infrastructure, right of way management, property valuation, condemnations and representation before local planning and zoning boards. | Legal Dept |
| Corporate Ethics Compliance | Manages and administers corporate ethics compliance programs. This includes various codes of conduct requirements, whistleblower cases, ombudsmen services, and associated compliance reporting. Includes training and compliance with separation of duties and affiliated interest codes of conduct. Includes Ethics training and compliance with Affiliate Transaction rules and regulations standards. | Legal Dept |
| Environmental Law | Handles matters involving Environmental law for the corporation including environmental permitting activities, due diligence, defense in enforcement actions, compliance advice, representation in environmental cleanup. Includes Environmental litigation costs | Water Law (Legal Dept) |
| Regulatory | Provides legal advice, representation and counseling in matters arising under federal and state energy regulatory laws, regulations and policies as they relate to companies that own and operate utility related assets and engage in the generation, transmission, purchase, sale and delivery of electricity and the purchase, sale and delivery of natural gas. | Water Law (Legal Dept) |
| Corporate Secretary | Plans and conducts board of directors and committee meetings. Plans and conducts annual shareholder meeting. Manages board administration. Cost of preparation, distribution, and solicitation of proxies is included here.<br>Includes all support costs, including reimbursed travel expenses, for the Board of Directors/Trustees and costs associated with a company's annual meeting. | Board of Trustees Support |

## 7.26.2 Results

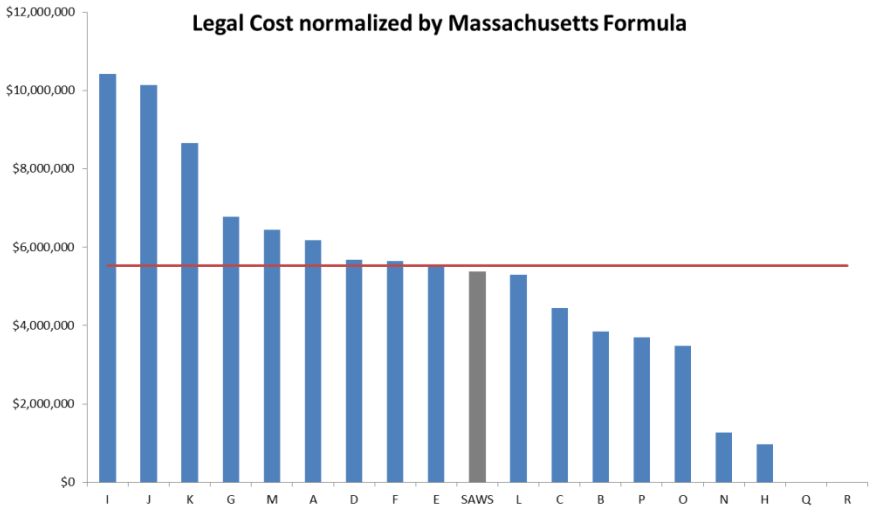
The chart below compares the total cost of providing Legal functions per FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 55: Legal cost per FTE**




The chart below compares the total cost of providing Legal functions normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 56: Legal cost normalized by Massachusetts Formula**




Based on our analysis, Legal costs are slightly lower than median levels when compared with the PA panel of national utilities.

## 7.27 Industry Benchmarking

Typical legal operational metrics, such as lawyer utilization, hours spent per transaction, and ratio of junior lawyers to senior attorneys, are not utilized at SAWS.

However, despite not having defined operational metrics, PA found that internal customers are very satisfied with the quality of legal advice and turnaround time of the group. The department has endeavored to advocate that other departments involve the Legal function in a collaborative manner when addressing issues which require legal advice. SAWS strives to strategically include attorneys in planning processes, rather than only reactively after facts and positions are solidified. Thus, it was determined by

the department to not use typical operational metrics that may create a disincentive for user departments to proactively utilize legal resources.

## 7.28 Area Specific Analysis - Outsourcing of Legal Work

Occasionally, SAWS outsources legal work when it lacks subject matter expertise or there is a shortage of resources. However, PA found that even when SAWS outsources legal work, it internally manages as much of the routine work as possible (tasks such as gathering discovery requests, preparing witnesses for depositions, preparing exhibits, and technical support for contracts and/or litigation).

Data obtained from SAWS indicates the following with respect to outside counsel expenditures in 2012 and the preceding two years:

In 2012, the total expenditure for outside counsel was $3,935,866. Of that, approximately 75% of the fees were spent on three specific and unique matters

- Wastewater Permit Matters - $2,327,655 (59%)
- Brackish Groundwater Desalination Project - $309,068 (8%)
- Employment Litigation matters- $286,028 (7%)

The remaining $1.0 million was spent on what can be generally described as recurring/routine general legal matters, including other employment litigation.

In 2011, the total expenditure for outside counsel was $2,596,748. Of that, approximately 45% of the fees were spent on three specific and unique matters:

- Wastewater Permit Matters - $600,626 (23%)
- Condemnation Litigation for specific sewer outfall project- $320,175 (12%)
- Employment Litigation matters - $253,151 (10%)

The remaining $1.4 million was spent on what can be generally described as recurring/routine general legal matters, including other condemnation and employment litigation.

In 2010, the total expenditure for outside counsel was $2,058,460. Of that, over 30% of the fees were spent on three specific and unique matters:

- Breach of Contract with another governmental entity on Water Supply Project - $328,286 (16%)
- Gonzales County Underground Water Conservation District Permit application matter - $217,296 (11%)
- Employment Litigation matters - $111,072 (5%)

The remaining $1.4 million was spent on what can be generally described as recurring/routine general legal matters, including other employment litigation.

## 7.29 Observations

From a cost efficiency standpoint, the SAWS Legal function is slightly below median, and compares favorably when measured against the PA panel of national utilities.

The Legal Department has been an important advisor to the organization in a variety of capacities. The broad scope of work that the group handles spans employment claims to construction contracts to reducing corporate wide risks and more. A small team of six lawyers ensures that legal advice is timely and accurate, ongoing issues and risks are reviewed and addressed, and ligation support is sourced effectively.

Customer value is created in a variety of ways, although it is not captured through metrics. This occurs through an annual dialogue with department customers on unique legal needs and alignment between

budget and customer needs, including evaluation of need for specialist assistance. Litigation expertise (and capacity) has been sourced externally, resulting in a department that is efficiently run. The culture is not based on the billable hour but rather on servicing the customers' and the organization's needs. Value is created via the strategy of positioning the department as a partner for the rest of the organization (as opposed to an adversarial group to be avoided).

## 7.30 Recommendations and Estimated Benefits

### 7.30.1 Develop a Long Term Strategic Goal that can be Benchmarked and Measured Going Forward

The philosophy of the Legal department is to provide full service, in-house legal support. Without tangible, measurable goals it is difficult to gauge how effective the performance of the department is, although when PA probed the various internal customers of Legal, the feedback regarding performance (i.e. quality of legal advice and turnaround time) was positive.

#### Recommendations

PA recommends that SAWS consider beginning to collect a few, easy-to-capture and relevant Key Performance Indicators (KPIs) that are aligned to business needs and the reality of a small, in-house department versus a large legal operation.

#### Estimated Benefits

PA has not quantified the specific benefits attributed to developing KPIs, but one can assume that this would result in enhanced management awareness and also contribute to being able to gauge customer value.

# PUBLIC AFFAIRS

## Executive Summary

### Overview

The Public Affairs department includes Inter-Governmental and External Relations (IGR) and Communications areas. IGR is responsible for state, federal/regional, and local (City/County) affairs. The Communications group is responsible for creative services, web and online engagement, public/media relations & events, and advertising.

### Overall Observations

With 31 FTEs at year-end 2012 responsible for IGR and Communications-related functions collectively called Public Affairs, from a cost efficiency standpoint, the SAWS Public Affairs function is slightly below median when compared nationally to other utilities at cost per-customer and at median cost levels when normalized by the Massachusetts Formula, which indicates that overall costs are in a reasonable and acceptable band for the overall Public Affairs function. PA has, however, identified specific improvements in the Public Affairs group that will align the spending in the IGR area to that of PA's panel of national utilities.

### Areas of Excellence

- *Development of key relationships*: SAWS has developed relationships with members of state-wide and regional government that have the potential to support SAWS water resource projects.

### Areas of Potential Improvement

- *Organizational realignment:* SAWS can improve in performance of this area by better reorganizing resources and responsibilities in the department.
- *Better utilization of technology:* While SAWS values data and is doing a good job communicating with its customers, it could do more by better leveraging technology (website) and other digital media tools.

### Recommendations and Expected Financial Benefits

PA has recommendations in the Public Affairs area which is expected to result in approximately $451,000 in annual Operations & Maintenance (O&M) savings through the reorganization of management and staff and examining the group's available resources and responsibilities. It is recommended that these proposed resource re-directions be managed in a non-disruptive manner over an 18-month period. We also recommend improvements to the website, which has been quantified as part of the Customer Service

section. The second one, helping the Communications Department focus on the future, has not been quantified as part of this analysis.

- NPV is calculated to be approximately $2 million under the following assumptions:
  - Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
  - Benefits accrued between January 1, 2015 and December 31, 2019.
  - Discount rate of 5%.
  - Inflation rate of 2.5%.

**Table 39: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Improve alignment among public affairs responsibilities | Positions | $411,000 through better alignment and improved productivity |
| 2 | Re-evaluate survey costs | Process | $40,000 through fewer surveys |
| 3 | Explore online strategies and improve communications metrics | Process | PA has not quantified benefits in this area |
| 4 | Focus on the future for communications | Process | PA has not quantified benefits in this area |

## Introduction

Though Government Affairs and Communications are two separate shared service areas in the PA benchmarking survey, these two functions fall under one department at SAWS called Public Affairs, and therefore are analyzed as one area in this section.

In the Government Affairs area, called Inter-Governmental and External Relations at SAWS, there are three managers who are each responsible for state, federal/regional, and local (City/County) affairs. At a state level, there is one manager who develops relations with key politicians and regulatory agencies in the state, and during the legislative session, one additional staff member is borrowed from the local level to help manage the Austin office workload. The manager also oversees two state lobbyists. At a federal and regional level, there is one manager and three staff—the staff members work in regional offices. This manager is in charge of managing the regional staff members, as well as the federal lobbyist who works from Washington DC. At a local level, there is one manager and eight staff—four of which handle local governmental relations support, two of which are educators and handle educational programs, and two staff members work on affordability programs with the City. (For benchmarking purposes, education is included in Communications.)

The Communications group is responsible for creative services, web and on-line engagement, public/media relations & events, and advertising. There are two managers in this area. One of the managers oversees four staff positions that handle public/media relations, events and advertising as well as certain publications. This staff handles media inquiries, distributes news stories to the media, and books advertising spaces for conservation and grease programs. The other Communications manager oversees seven positions in the Creative Services group, which is responsible for internal communications with employees, video production, printed and electronic newsletters, social media, and the SAWS websites. The Communications group also contracts with the DeBerry Group to provide external public relations and crisis communications support.

# 7.31 PA Cost Benchmarking

### 7.31.1 Governmental Affairs Responsibilities and Sub-Process Definitions

The PA Public Affairs process responsibilities include the following for benchmarking purposes:

**Table 40: PA Public Affairs process responsibilities**

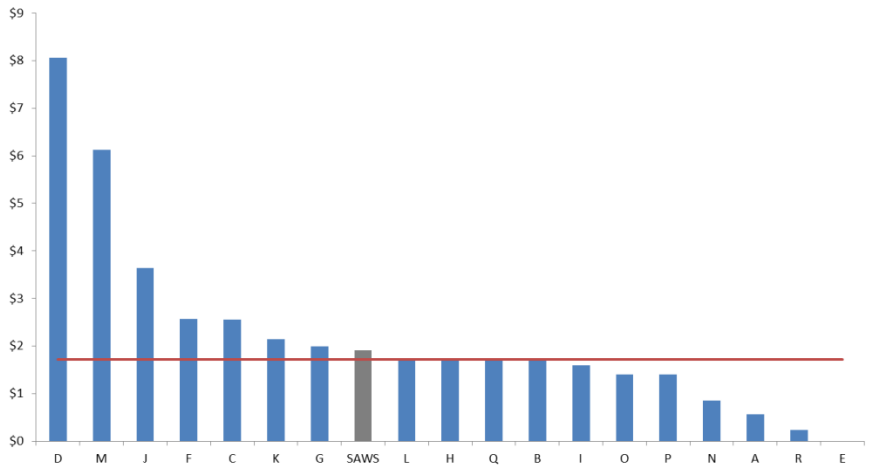
| Sub-Process | PA Public Affairs sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Federal/Regional Government Affairs | Maintaining corporate relations with the federal government. Working with lobbyists, federal legislators and agencies, and other government officials. Advocating the corporate position on the federal level. Includes lobbying expenses, policy-related research and communication; coalition-building and recruitment activities, grassroots advocacy, and costs associated with other political programs.<br>Includes relationship development and maintenance work with regional organizations such as the League of Cities, Statewide Association of County Supervisors, Association of Cities and Towns, and regional or local chambers of commerce. | Federal Lobbying Contract (Public Affairs)<br>Regional Government Affairs (half of Manager of Legislative Affairs' salary)<br>Federal Government Affairs (half of Manager of Legislative Affairs' salary) |

| Sub-Process | PA Public Affairs sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| State Government Affairs | Advocating of the corporate positions at the state level. Maintaining corporate relations with the state government including legislators, the Governor's office state agencies, and other state government officials. Serving as the corporate representative to these state officials on matters of reliability concerns, customer care, philanthropic and complaint resolution. Providing policy strategy counsel to senior management and facilitate senior management interaction with state officials.<br>Includes lobbying expenses and state capital office expenses, including office lease costs. | Legislative Affairs (Public Affairs)<br>Note: this position was vacant in 2012 and 2013, therefore the 2011 salary was used as a substitute and inflated to 2012 dollars.<br>State Lobbying Contracts (Public Affairs) |
| Local/ Government Affairs | Maintaining positive relations with County and Local municipalities and agencies, and as the Corporate representative to these and other external organizations on matters involving construction and operations approvals, reliability concerns, sponsorships, policy communication, permit applications, complaint resolution, informational presentations, public relations, and advocacy and coalition development. | Community Outreach (Public Affairs)<br>Local Government Affairs (Public Affairs) |

## 7.31.2 Governmental Affairs Results

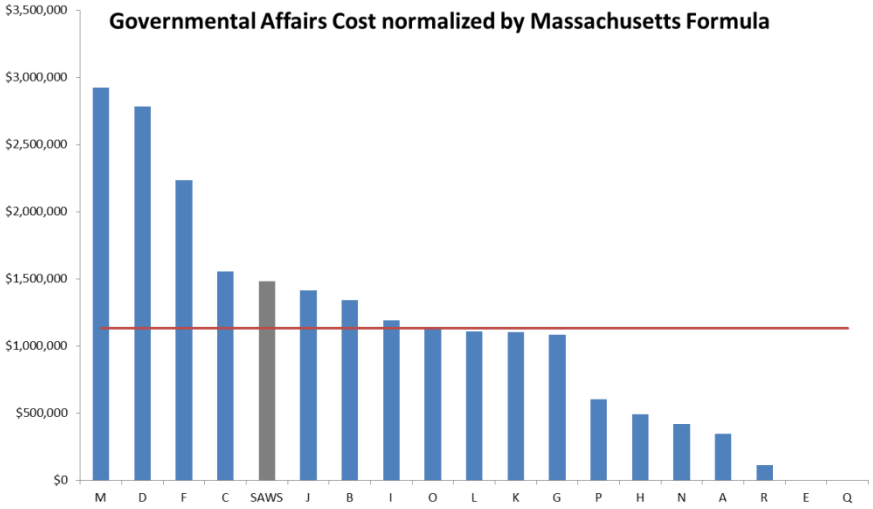
The chart below compares the total cost of all governmental affairs-related activities per-customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 57: Governmental Affairs cost per customer**




The chart below compares the total cost of all governmental affairs related activities normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 58: Governmental Affairs cost normalized by Massachusetts Formula**



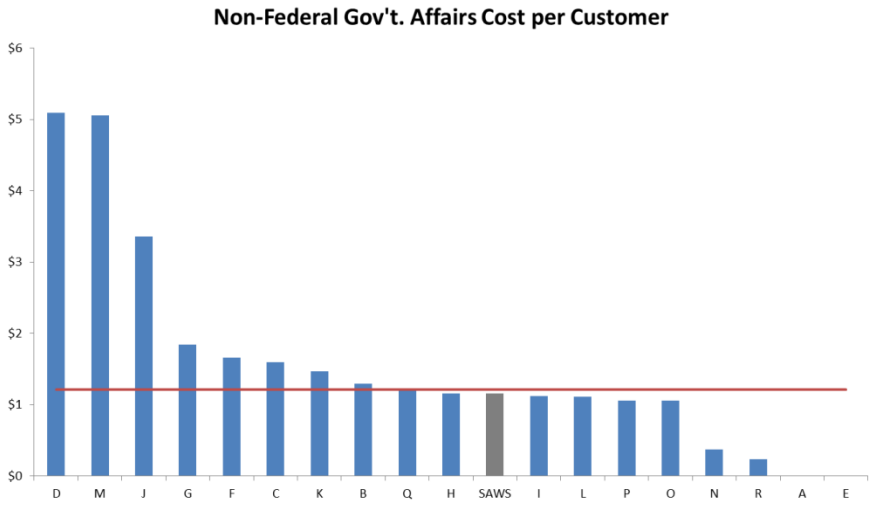

Based on our analysis, total Governmental Affairs costs per-customer are slightly above median values, and normalized costs are above median values of the PA panel of national utilities, indicating opportunities for improvement.

## Non-Federal Government Affairs

An analysis was also conducted on non-federal governmental affairs. The results below show state and local outreach costs compared with those in the PA panel of national utilities.

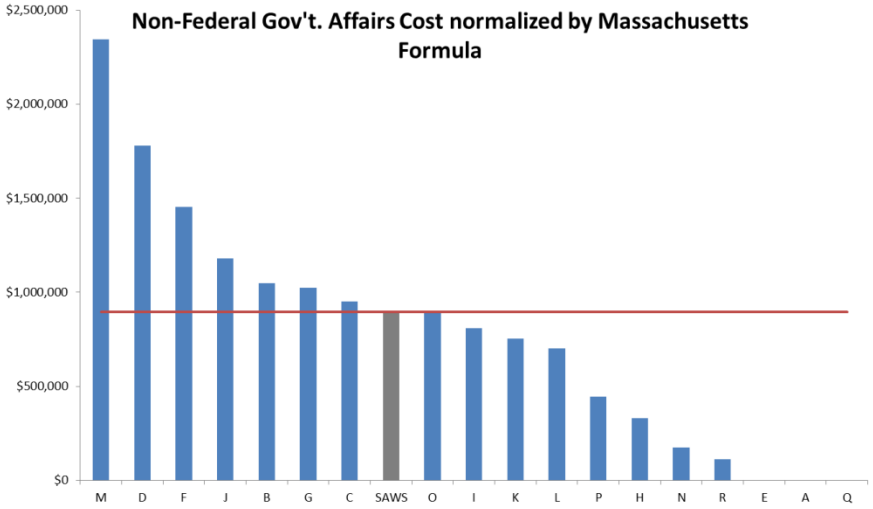
The chart below compares the total cost of all non-federal governmental affairs related activities per Customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 59: Non-Federal Governmental Affairs Cost per Customer**




The chart below compares the total cost of all non-federal governmental affairs related activities normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 60: Non-Federal Government affairs cost normalized by Massachusetts Formula**

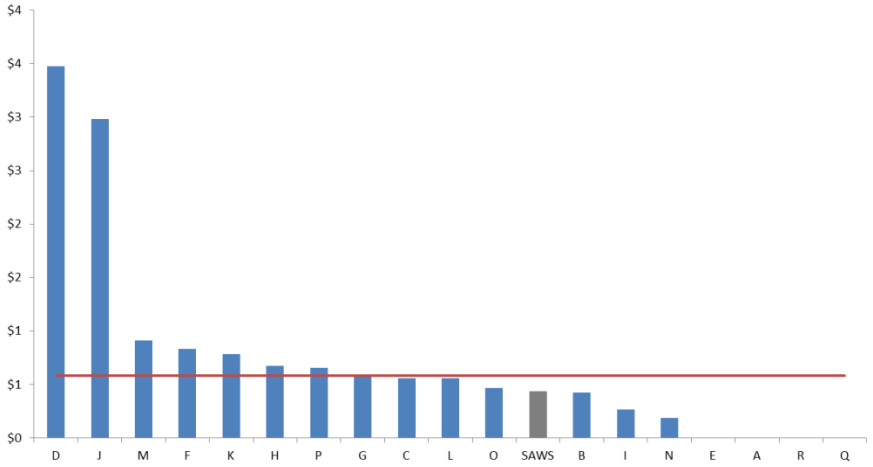



Based on our analysis, total non-Federal Governmental Affairs costs both per-customer as well as normalized are at median values of the PA panel of national utilities, indicating costs are in an acceptable band for spending.

## State Government Affairs

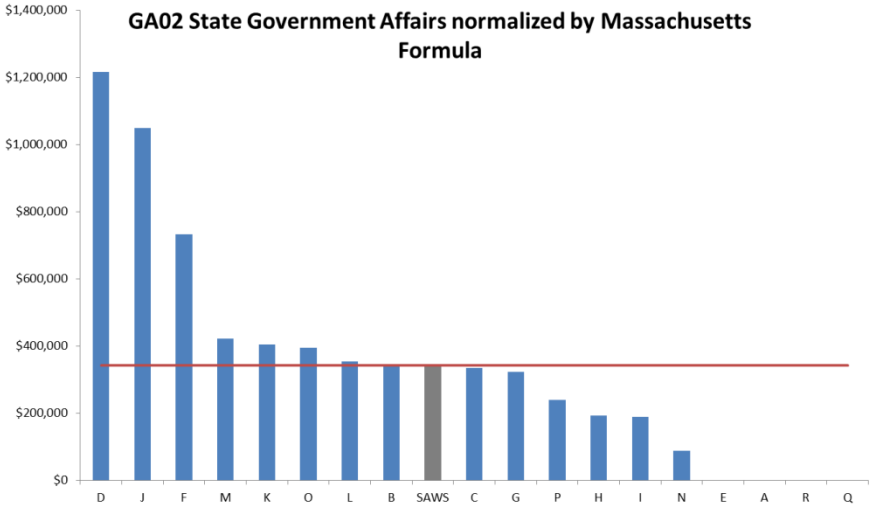
The chart below compares the total cost of only state governmental affairs-related activities per-customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 61: GA02 State Government Affairs per Customer**




The chart below compares the total cost of only state governmental affairs-related activities normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 62: GA02 State Government affairs normalized by Massachusetts Formula**

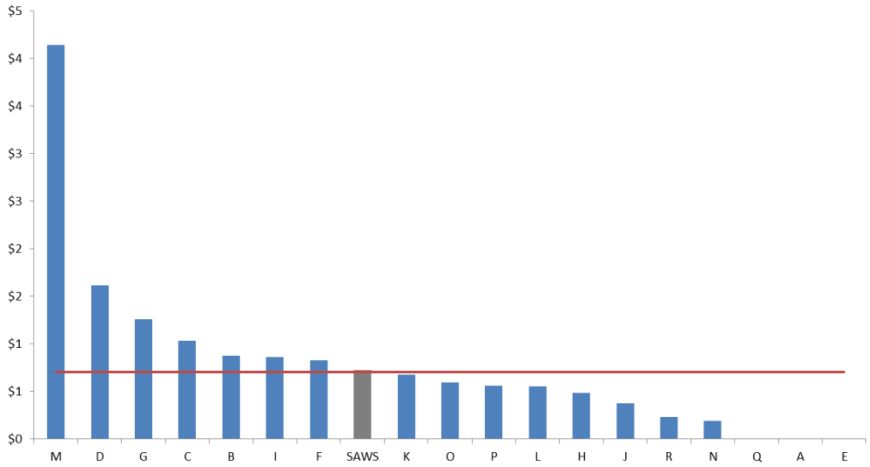



Based on our analysis, State Governmental Affairs costs both per-customer as well as normalized are at or below median values of the PA panel of national utilities, indicating an acceptable band for spending.

## Local Affairs

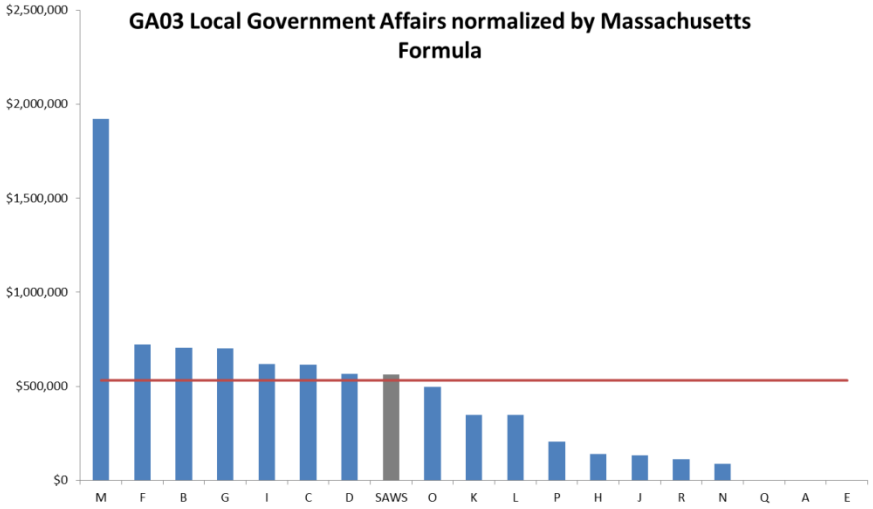
The chart below compares the total cost of only local affairs related activities per-customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 63: GA03 Local Government affairs per customer**




The chart below compares the total cost of only local affairs related activities normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 64: GA03 Local Government affairs normalized by Massachusetts Formula**




Based on our analysis, Local Affairs costs per-customer are at the median level and when normalized are just slightly at or above median values of the PA panel of national utilities, which indicates a reasonable band of spending.

## 7.31.3 Communications Responsibilities and Sub-Process Definitions

The PA Communications process responsibilities include the following for benchmarking purposes:

**Table 41; Communications responsibilities and sub-process definitions**

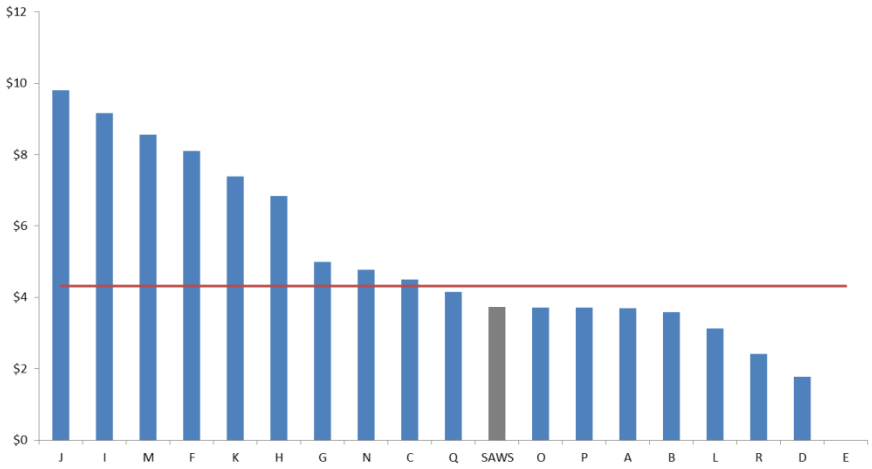
| Sub-Process | PA Communications sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Media Relations | Researching and developing media responses, positioning, and strategy to respond to media inquiries or place stories in the media. Developing press releases, arrange interviews, maintain 24/7 media relations availability. Includes communications resources with respect to corporate responsibility, etc. | Communications/PR and Events (Public Affairs) |
| Corporate Awareness | Communications or advertising spending for general corporate awareness and image purposes. | Communications (Public Affairs) |
| External Informational and Educational Communications | Communications or advertising spending that provides information and education messaging on topics such as water conservation (not the actual program itself) and public safety. Promotional messaging would include communication efforts around e-billing and budget billing, for example. Production costs of monthly bill inserts should also be included here.<br>Developing and executing special educational programs such as public safety, environmental programs, producing communication materials, holding briefings, distributing pamphlets, etc. at a local level. | Communications (Public Affairs)<br>Creative Services (Public Affairs)<br>Education/External Outreach<br>(IGR/Public Affairs) |
| Product/Service Promotion | Communications or advertising spending that promotes products and/or services from which the utility or an unregulated business will generate | Communications (Public Affairs) |

| Sub-Process | PA Communications sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| | revenue. If regulated, these costs are generally given recovery in treatment of rates. Includes communications and advertising support for low income rate subsidization programs. | |
| Water Conservation Marketing and Communications | Advertising and general communications costs, not reported above, related to mandated and commission approved water conservation programs and offerings. Includes low income water conservation program communications and advertising. Market research in support of specific programs, products, or services is not included in the scope of this survey. | Communications (Public Affairs)<br>Creative Services (Public Affairs) |
| Sponsorship Spend | Total spend on sponsorships. | Community Outreach (Public Affairs) |
| Internal and Intranet<br>Communications | The communication between employees or departments across all levels, or divisions, of an organization, such as team briefings, interviews, employee or works councils, meetings, memos, an intranet, newsletters, the grapevine, and reports. Producing electronic, print and video communications targeted to the full organization (e.g., HR policy changes. major corporate Initiatives). Producing electronic, print and video communications targeted to employees within business units such as generation plants etc. Includes executive communication support. | Creative Services (Public Affairs) |
| External Publication Production and Communications | Designing and producing electronic and print communications targeted at external audience. (Examples of reports are: Consumer Confidence and Regulatory. Managing multimedia events, executive meetings, and conferences. Includes executive communication support, and speech writing, for external communications. | Communications (Public Affairs)<br>Creative Services (Public Affairs) |
| Internet Website Content Development and Maintenance | Implementing and maintaining content for websites aimed external audiences. Includes interface with IS and electronic billing site. Content development activities captured in enterprise-wide and business unit-specific communications. Includes externally social media such as twitter and Facebook. Social media monitoring activities should be included in this sub-process. | Creative Services (Public Affairs) |

## 7.31.4 Communications Results

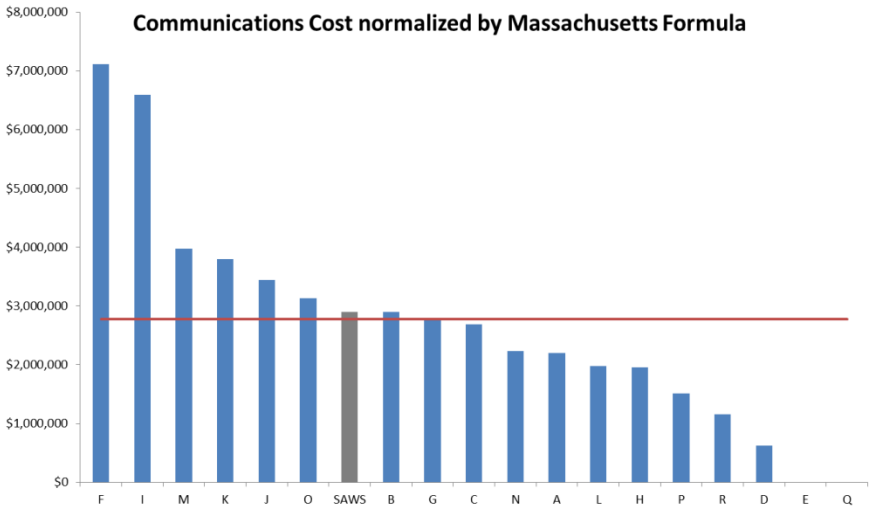
The chart below compares the total cost of all communications activities per-customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 65: Communications cost per customer**




The chart below compares the total cost of all communications activities normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 66: Communications cost normalized by Massachusetts Formula**




Based on our analysis, total communications costs per-customer are below the median level and when normalized are just slightly above median values of the PA panel of national utilities which indicates that costs are in a reasonable band of spending.

## Total Communications (Including Sponsorship Costs)

Typically, company sponsorships are excluded in results, as the dollars spent on sponsorships can vary widely from utility to utility. However, for SAWS discussion purposes, we have also included the results that include sponsorship spending for all utilities, as this is an area of scrutiny from external stakeholders.

The chart below compares the total cost of all communications activities including sponsorships per customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 67: Communications and Sponsorships cost per customer**

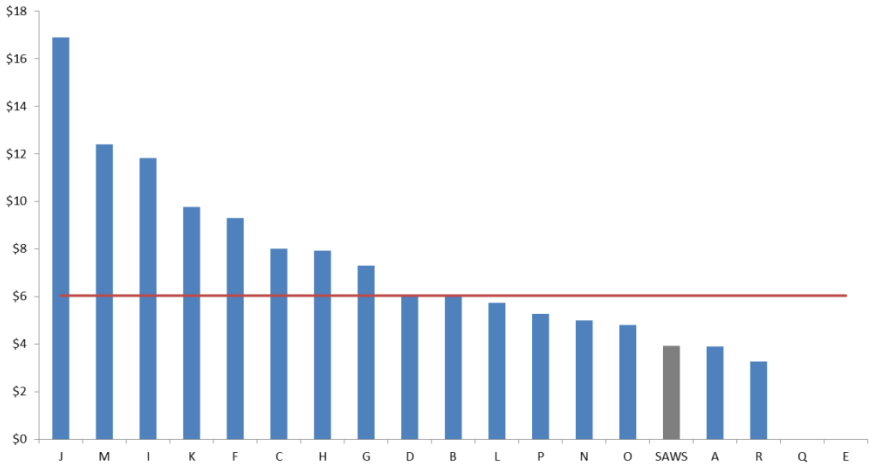
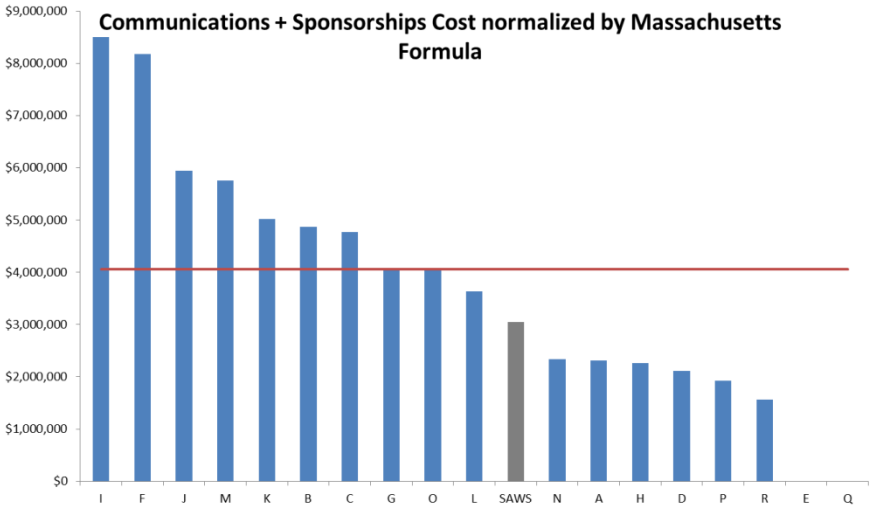



**Figure 68: Communications and Sponsorships normalized by Massachusetts Formula**




Including sponsorships, SAWS Communication costs are lower than the PA panel of national utilities, indicating that sponsorship costs are significantly lower at SAWS compared to the PA panel of national utilities.

Based on our analysis, total Communications costs inclusive of sponsorships are below median levels both when evaluated per-customer and when normalized, which indicates that costs are favorable when compared with PA's panel of national utilities.

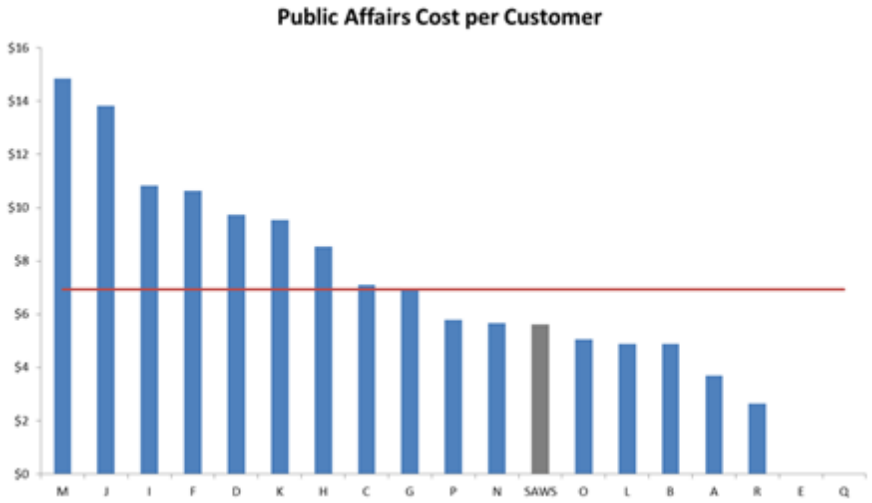
## 7.31.5 Public Affairs Results

### Total Public Affairs

Because Government Affairs and Communications are under the same department at SAWS, their costs are combined and shown below.

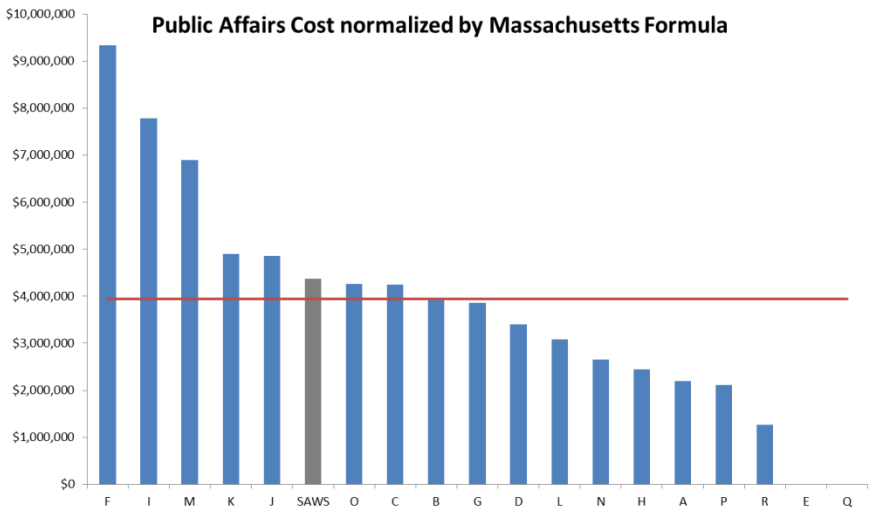
The chart below compares the total cost of both Governmental Relations and Communications activities, collectively called Public Affairs, per-customer for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 69: Public Affairs cost per customer**




The chart below compares the total cost of both Governmental Relations and Communications activities, collectively called Public Affairs, normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 70: Public Affairs cost normalized by Massachusetts Formula**




Based on the analysis, SAWS total public affairs costs are lower than the PA panel of national utilities when compared per-customer and slightly above median when normalized by the Massachusetts Formula, which indicates that overall costs are in a reasonable and acceptable band for the overall function.

## 7.32 Governmental Affairs Observations

From a cost efficiency standpoint, the SAWS Governmental Relations function is slightly higher than median when compared with the PA panel of national utilities.

- Of note is the work associated with maintaining relationships with surrounding communities to support the Water Resources department in procuring water rights and developing regional water supply projects. Responsibilities in this area entail developing relationships with key constituents, and building

the SAWS brand in those communities. IGR responsibilities do not include technical analysis, which is performed by the Water Resources department.

- From 2009, regional IGR has achieved a few key successes, mainly the support of Wilson County for SAWS' planned brackish groundwater desalination program. They have also developed relationships with certain members of the Texas government that have the potential to assist in supporting SAWS' Water Resource projects. However, there are transparency issues around the responsibility of regional IGR staff who conduct their work in remote/satellite office locations.

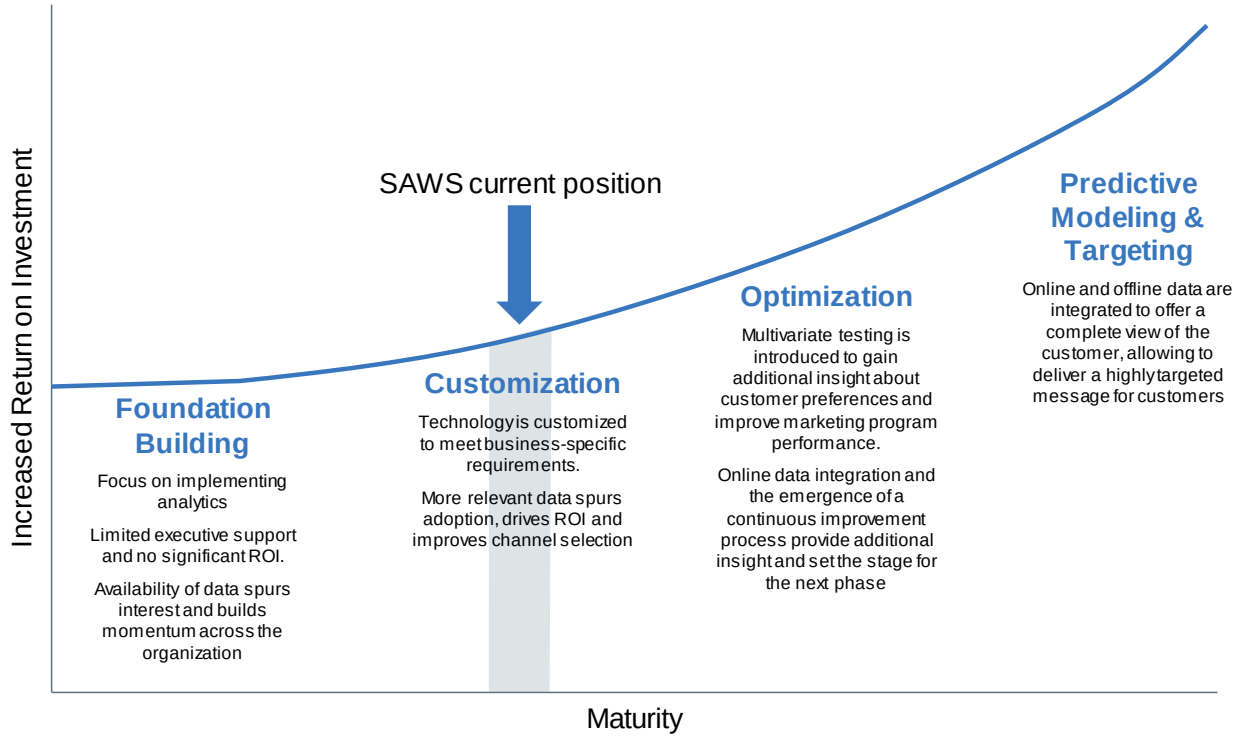
## 7.33 Communications Observations

- Costs for Communications responsibilities are comparable to the median among the peer panel.
- SAWS invests in surveys (currently under contract with WPA Research) to better understand the reach and favorability of campaigns and rate increases. However, these surveys are tailored to the particular program, rate increase, or advertising campaign, and therefore trends in overall perceptions about SAWS are difficult to ascertain. A Customer Satisfaction Survey is conducted on a more regular basis, so it would be more efficient to add more detail to this survey (such as current campaign impressions/favorability) and conduct it once a year, instead of having to spend money on multiple surveys. Currently, the opinion research contract is worth $80,000 a year.
- SAWS also tracks its performance through metrics such as page views, number of events, or impressions. These metrics show performance against a set target. However, in examining three years' worth of data, there were some targets that stayed constant, for example, website page views were 400,000 a month from 2010 through 2012. This should be a moving target based on the number of customers or radius of outreach efforts.
- It should be noted through the KPIs, however, that 2012 suffered in performance with regards to impressions per dollars spent, and there was an increase in negative press.
- SAWS is required by law to provide educational curricula for local elementary schools. Dollars spent on educational programs come directly from fees generated from water pollution ordinance violations, therefore this cost is not a driver for any increase in rates.
- Sponsorships are a sensitive subject both internally and externally at SAWS. There are diverse opinions that SAWS spends too much on events, whereas others believe that SAWS needs to promote more public awareness in order to further long-term conservation or supply goals. Compared to the utilities that participate in PA's Shared Services Benchmarking program, SAWS does not outpace its peers in terms of amounts expended on sponsorships.

## 7.34 Industry Comparisons

- Below is a high level view of current SAWS Communications maturity. The following explains the different stages of maturity:
- Foundation Building: Focus on implementing analytics. Limited executive support and no significant return on investment (ROI). The availability of data spurs interest and builds momentum across the organization.
- Customization: The technology is customized to meet business-specific requirements. More relevant data spurs adoption, drives ROI, and improves channel selection.
- Optimization: Multivariate testing is introduced to gain additional insight about customer preferences and improve marketing program performance. Online data integration and the emergence of a continuous improvement process provide additional insight and set the stage for the next phase.

- Predictive Modeling & Targeting: Online and offline data are integrated to offer a complete view of the customer, allowing delivery of a highly targeted message for customers.[90]




- The SAWS Communications group is currently in the "Customization" phase of the maturity model, where analytics are used to measure customer interactions and the department recognizes it as valuable. Based on review of the documentation, Public Affairs is currently in the process of improving data usage, starting to track ROI, and considering channel selection. A metric under development, advertising effectiveness, is an example that will help SAWS move forward on the maturity continuum.

## 7.35 Recommendations and Estimated Benefits

### 7.35.1 Improve Alignment Among Public Affairs Responsibilities

Regional IGR staff are located in surrounding counties at satellite/remote locations, and there are several vacancies in the Communications and IGR groups that provide opportunity for consolidation of duties and efficiency

#### Recommendations

Responsibilities to cover federal, state, and regional activities should be better aligned with fewer resources. Regional IGR staff currently located in counties outside of San Antonio could be relocated to Austin. Re-evaluation of the workload could potentially reduce personnel in this area as a result of more efficient practices, since state, regional, and federal governmental affairs messages are similar in scope and nature, and target similar stakeholder groups.

[90] Adopted from the Stratigent Marketing Analytics Model.

### Estimated Benefits

A combination of improving alignment among the various sub-functions of Communications and IGR combined with improved productivity is expected to result in approximately $411,000 in annual savings. It is recommended that proposed resource re-directions be managed in a non-disruptive manner over an 18-month period.

## 7.35.2 Explore Online Strategies and Improve Communications Metrics

The department values data and does well to collect and analyze data. As the department matures, there are certain changes that are recommended that would move the Department along the maturity continuum to get better returns on investments. Also, the metric concerning page views is not the correct metric and the threshold appears low compared with actual achievements

### Recommendations

- PA recommends that SAWS explore an online strategy that is predictive and influences and changes end-user behavior to utilize marketing spending in a more effective way. Because online interaction is necessary, online data should drive corporate communications decisions and channel selection for greater reach and value.
- PA also recommends that SAWS develop a more strategic metric that not only measures page views but also the quality of information provided, based on the needs of the consumer (i.e. page clicks needed to answer a question, districts that visit a given page are 3 times more likely to reduce water consumption, etc.).

### Estimated Benefits

PA has not quantified benefits in this area.

## 7.35.3 Re-evaluate Survey Costs

SAWS conducts a number of surveys for each campaign.

### Recommendations

SAWS should reduce the number of surveys for each campaign and focus on an annual survey that can better track qualitative trends over time.

### Estimated Benefits

The current WPA contract is valued at $80,000 annually. A Customer Satisfaction Survey is conducted on a more regular basis, so it would be more efficient to add more detail to this survey (such as current campaign impressions/favorability) and conduct it once a year, instead of having to spend on multiple surveys. PA estimates the benefit to be approximately $40,000.

## 7.35.4 Focus on the Future for Communications

The Communications group should better articulate customer value, begin crafting campaigns that are more targeted based on consumer behaviors, and identify channels that have the most impact to selected segments through evidence-based analytics to move along the market maturity curve.

### Recommendations

SAWS should consider using a strategic framework or maturity model for planning the Communications group's direction over the next 5 years. The long term goal should be to have online and offline data integrated to offer a complete view of the customer, allowing delivery of a highly targeted message to

customers which can influence behavior in a measured and predictable way. This could include a more integrated approach across departments on the development and implementation of customer programs.

### Estimated Benefits

PA has not quantified benefits in this area.

## 7.35.5 Introduce IGR KPIs

There are currently accountability issues for IGR staff that are not based in the headquarters location.

### Recommendations

SAWS should introduce KPIs that are focused on IGR such as votes in favor of a SAWS project, or positive press that came directly from an IGR effort. This will address accountability and productivity concerns for remotely located IGR staff members.

### Estimated Benefits

PA has not quantified benefits in this area.

# SAFETY AND ENVIRONMENTAL HEALTH

## Executive Summary

### Overview

The Safety and Environmental Health function, in the Operations Group, is responsible for coordinating all SAWS safety activities and ensuring a safe environment for all employees.

### Overall Observations

With 14 FTEs responsible for safety-related functions, from a cost efficiency standpoint, total safety costs both per-FTE as well as normalized are slightly above median cost values of the PA panel of national utilities, which indicates opportunities for improvement. Organizationally, there are some improvements that SAWS should consider that would help in leveraging synergies with Claims and Risk Management and at the same time provide some degree of separation from Operations.

### Areas of Excellence

- *Technology:* Safety and Environmental Health, and Claims and Risk Management both share a common software program, called iVos, that was implemented in 2012. The two departments also work closely with each other inputting data and utilizing iVos.

### Areas of Potential Improvement

- *Organization:* While having Safety and Environmental Health fall under Operations affords for collaboration with that function, at the same time, there is an issue of ensuring adequate separation required for this function to be effective. Being removed from Claims and Risk Management also results in a loss of some operating synergies.
- *Reporting:* There is no monthly or quarterly claim/loss review, nor is there a regular report to management clearly identifying loss levels.

### Recommendations and Expected Financial Benefits

PA has one recommendation in the Safety area which is expected to result in approximately $319,000 in annual Operations & Maintenance (O&M) savings through the reorganization of management and staff and examining the group's resources and responsibilities. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

- NPV is calculated to be approximately $1.4 million under the following assumptions:
  - Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
  - Benefits accrued between January 1, 2015 and December 31, 2019.
  - Discount rate of 5%.
  - Inflation rate of 2.5%.

**Table 42: Recommendations and Expected Financial Benefits**

| | Recommendation | Type | Expected Savings |
|---|---|---|---|
| 1 | Combine Safety and Environmental Health, Claims, and Risk Management under single management | Positions | $319,000 in potential savings through organization restructuring and improved productivity |
| 2 | Develop a comprehensive report for claims and losses | Process | No benefits quantified |
| 3 | Conduct an assessment whether SAWS should provide or outsource Claims and Risk Management services | Policy | No benefits quantified |

## Introduction

The Safety & Environmental Health group, in the Operations functional area, is responsible for coordinating all SAWS safety activities and ensuring a safe environment for all employees. This includes all departments, facilities, and field operations of:

- Production & Treatment;
- Distribution and Collection;
- Engineering and Construction;
- Service Centers;
- Laboratory;
- Support groups such as Electricians; Meter Technicians and Readers;
- Lift Stations;
- Heating & Cooling; and
- Ancillary groups such as Customer Service; Emergency Operations; Water Resources; and Conservation.

Services provided by this function include:

- Ergonomic assessments;
- Conducting safety meetings;
- Administering immunizations (influenza, hepatitis B, tetanus);
- Providing Department of Motor Vehicle (DMV) reports on all drivers;
- Field inspections;
- Confined space entries;
- Deliver training for First Aid – CPR, Lockout Tagout, Confined Space, Trenching and Shoring (approved for TCEQ water and wastewater credit), and HAZMAT training and drills; and
- Conducting training on all heavy equipment such as Backhoes, Excavators, UTV's, Aerial Lifts, and LowBoys, as examples.

There are 13 FTE positions in this area.

# 7.36 PA Cost Benchmarking

### 7.36.1 Responsibilities and Sub-Process Definitions

The PA Safety and Environmental Health process responsibilities include the following for benchmarking purposes:

**Table 43: Responsibilities and sub-process definitions**

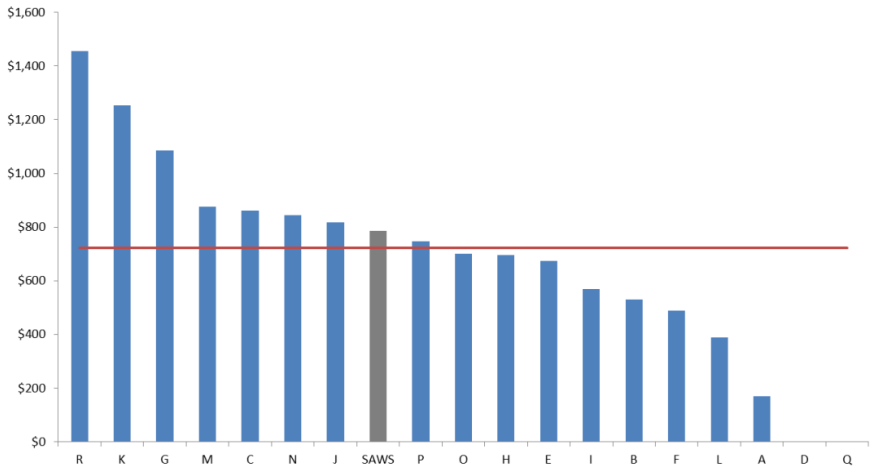
| Sub-Process | PA Shared Safety and Environmental Health sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Occupational Health Policy and Compliance | Occupational health policy development and compliance reporting, including industrial hygiene. | Safety and Environmental Health (Operations Group) |
| Safety Policy, | Safety policy development, safety training requirements, needs | Safety and |

| Sub-Process | PA Shared Safety and Environmental Health sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Investigations, and Reporting | assessments and training program development, and compliance reporting, including investigation leadership and support. Field safety supervisors and field safety specialists are included. | Environmental Health (Operations Group) |

## 7.36.2 Results

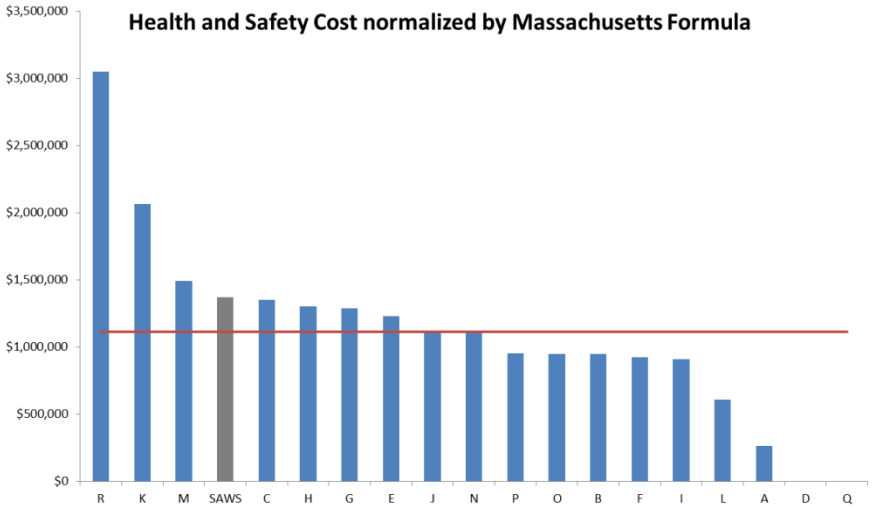
The chart below compares the total cost of providing safety related functions per-FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 71: Health and Safety cost per FTE**




The chart below compares the total cost of providing safety related functions normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 72: Health and Safety cost normalized by Massachusetts Formula**

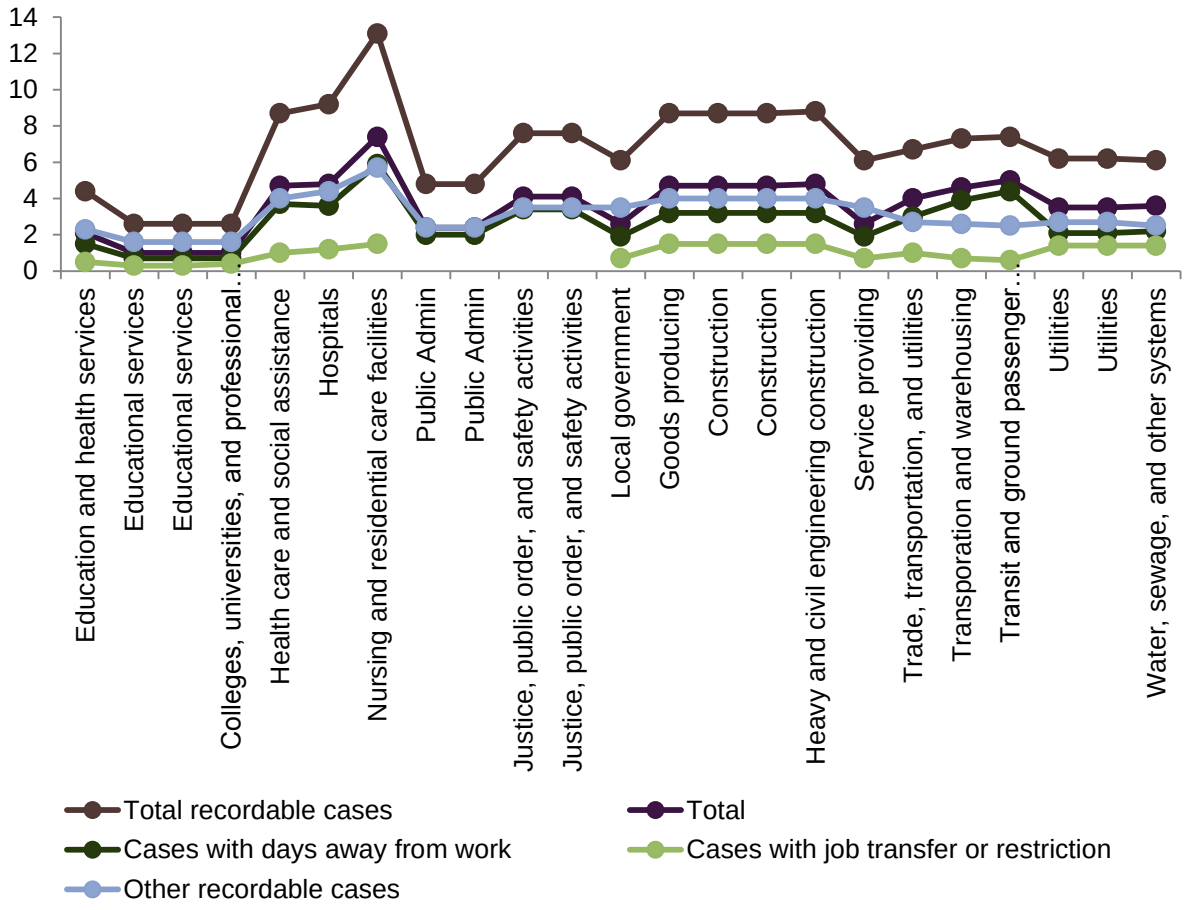


Based on our analysis, total safety costs both per-FTE as well as normalized are slightly above median cost values of the PA panel of national utilities which indicates opportunities for improvement.

## 7.37 Industry Benchmarking

SAWS is a municipal utility, therefore it does not have to report to OSHA standards, and consequently has not received any citations in recent years. In recent years, SAWS has been over the average DART (Days Away, Restricted, and Transferred) and TRIR (Total Recordable Incident Rate) for the industry.

**Figure 73: Industry benchmarking**




## 7.38 Area Specific Analysis - Claims and Risk Management

Safety and Environmental Health, Claims, and Risk Management both share a common software program, called iVos, which was implemented in 2012. The two departments also work closely with each other inputting data and utilizing iVos.

The charts below show the quantity and costs associated with the various types of claims in 2011 and 2012.

**Figure 74: Total claims**

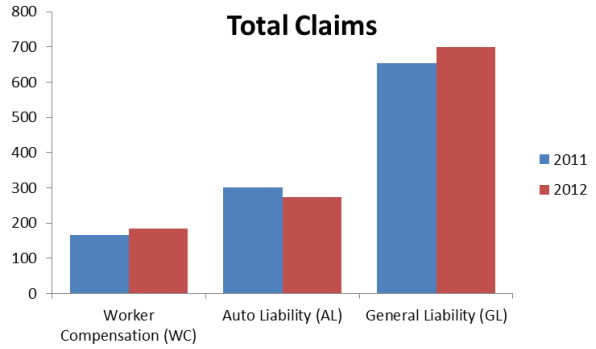



**Figure 75: Average cost**

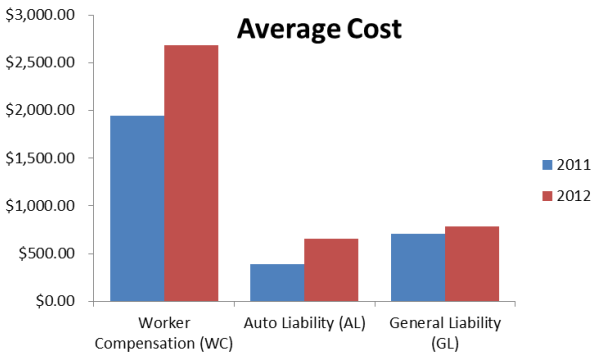
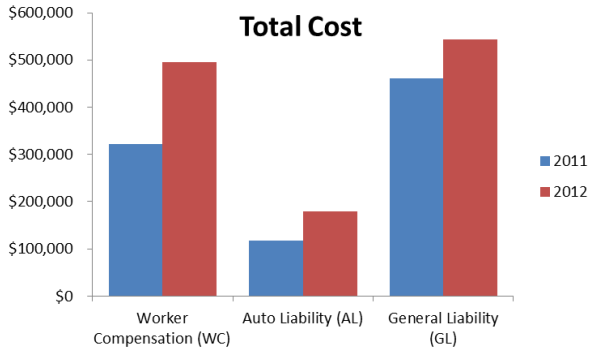



**Figure 76: Total cost**




## 7.39 Observations

From a cost-efficiency standpoint, the Safety and Environmental Health group's costs are slightly higher than median levels when compared with the PA panel of national utilities.

- Overall Cost - At a per-FTE level as well as after normalizing SAWS costs, PA found total costs to be higher than the median level of the PA panel of national utilities, which indicates opportunity for improvement.
- Safety and Environmental Health was located in the Operations functional area. Claims and Risk Management was located in the Legal department.

- Though there is use of a common system, iVos, in this area, which is good, there is a lack of single comprehensive reporting for claims and losses.
- With regard to claims, we observe that many of the claims that SAWS typically receives appear to be frequent and commodity-type in nature, rather than large unique claims.

## 7.40 Recommendations and Estimated Benefits

### 7.40.1 Combine Safety and Environmental Health, and Claims and Risk Management

While Safety and Environmental Health being located under Operations offers greater collaboration with Operations, there is an issue of simultaneously ensuring adequate separation required for this function to be effective combined with a loss of potential synergies being separate.

#### Recommendations

PA recommends combining the groups, given that both exhibit operating synergies and moving Safety and Environmental Health out of Operations for required separation of management authority of both the Safety and Operations groups. SAWS should consider an Enterprise Risk Manager who oversees these functions and be responsible for examining claims and safety trends, and tailoring specific safety training programs to address those trends. The Enterprise Risk Manager should also be experienced in purchasing insurance products tailored to effectively mitigate various risks across the entire organization.

#### Estimated Benefits

The combination of increasing the number of employees per safety representative, reorganization of management and staff, and improving productivity is expected to result in approximately $319,000 in annual savings. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

### 7.40.2 Develop a Comprehensive Report for Claims and Losses

There is no monthly or quarterly claim loss review, nor is there a regular report to management clearly identifying loss levels.

#### Recommendations

- PA recommends that SAWS develop a comprehensive report for claims and losses.

#### Estimated Benefits

PA has not quantified specific benefits attributed to having a comprehensive report but one can assume that this would result in enhanced management awareness and, consequently, improved tracking of claims and losses.

### 7.40.3 Conduct an Assessment Whether SAWS Should Provide or Outsource Claims and Risk Management Services

With an average value between $350 and $2,700 per claim for the various types of claims, the vast majority of the activity in this area could be classified as commodity-type in nature.

#### Recommendations

PA recommends that SAWS conduct a focused study to evaluate the value of outsourcing or right-sizing its claims and risk management functions. While we recognize the outstanding value that it provides, this is not a core function of the utility and should be analyzed if a third-party provider would be able to provide

the same type of service at a lower cost, or if certain business policies should be evaluated further that would result in increased productivity.

### Estimated Benefits

No benefits have been quantified.

# SECURITY

## Executive Summary

### Overview

The Security department is responsible for ensuring the security of employees and critical assets necessary to provide quality potable water and wastewater services, while also protecting SAWS employees.

### Overall Observations

With 12 FTEs responsible for the Security function, from a cost efficiency standpoint, PA found the SAWS Security function to be higher than median when compared with the PA panel of national utilities, indicating an opportunity for improvement.

### Areas of Excellence

- *Improved reporting methods:* SAWS has implemented electronic and more streamlined ways of reporting shift activity, and visitor badging and access control systems activities.

### Areas of Potential Improvement

- Reducing security contract.
- Defining roles.

### Recommendations and Expected Financial Benefits

PA has recommendations which are expected to result in approximately $495,000 in annual Operations & Maintenance (O&M) savings through improved productivity and renegotiating the security contract. It is recommended that any proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

NPV is calculated to be approximately $2.3 million under the following assumptions:

- Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Investment of $50,000 in the construction of new gates and remote gate control
- Benefits accrued between January 1, 2015 and December 31, 2019.
- Discount rate of 5%.

– Inflation rate of 2.5%.

**Table 44: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Annual O&M Savings |
|---|---|---|---|
| 1 | Renegotiate security contract | Positions | $420,000 in potential savings through renegotiation of contract for different coverage levels |
| 2 | Realign security staff roles | Process | $75,000 due to improved productivity |

## Introduction

The SAWS Security Department is responsible for ensuring the security of employees and critical assets necessary to provide quality potable water and wastewater services.

The department is comprised of 12 FTEs, two part time employees, and approximately 80+ contract staff. There are two areas of security responsibilities, physical and personnel, which are the responsibility of this function.

SAWS maintains approximately 500 separate properties that each have varying levels of security based on their function, location, and overall importance to the system. Physical security focuses on physical security subsystems and components (access control, CCTV, fencing, and evidence collection). Specific responsibilities include:

- Managing third-party alarm and monitoring systems,
- Conducting physical security vulnerability and site assessments of critical properties,
- Working with Engineering & Construction to ensure site designs meet required security regulations, and to specify, design, and place security for new construction and site upgrade projects (fencing, landscaping, lighting, CCTV, access control, locks and locking mechanisms, buffer zones, etc.),
- Maintaining approximately 600 CCTV cameras, 75 video recorders, over 1,000 access control components, and other components required to support critical security systems,
- Issuing credentials and maintenance of badging equipment, and
- Assisting IS with support of wireless network communications infrastructure necessary to transmit security system communications.

Personnel security focuses on physical security subsystems and components (guards, visitor management, criminal investigations, etc.). Specific responsibilities include:

- Ensuring contract compliance and quality control related to the guard contract,
- Investigating criminal acts and security breaches (internal and external),
- Recommending corrective measures to prevent breaches at SAWS sites,
- Responding to alarms generated by third-party alarm and monitoring systems (including SCADA power and system outages),
- Serving as liaison between SAWS, law enforcement, and other local utilities to share information related to security measures,
- Providing visitor management and security to critical employee facilities and events.
- Continuous monitoring of approximately 600 CCTV cameras, over 1,000 access control components, and other components required to support critical security and life/safety systems (operate security control center on a round-the-clock basis every day),
- Acting as a critical piece of SAWS Emergency Response team (alarms, evacuations, and chemical spill responses), and
- Performing mobile patrols to approximately 500 company properties and escort contractors/visitors as necessary.

# 7.41 PA Cost Benchmarking

### 7.41.1 Responsibilities and Sub-Process Definitions

The PA Security process responsibilities include the following for benchmarking purposes:

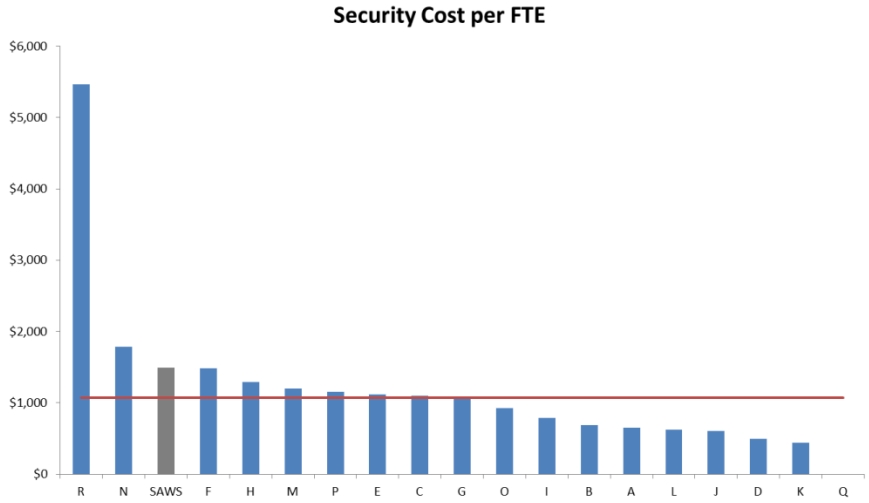
**Table 45: Responsibilities and sub-process definitions**

| Sub-Process | PA Security sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Security Related Government Coordination | Manage compliance with security related government regulations. Evaluate proposed changes to existing and new regulations for impact to company operations including policy, cost of compliance, and implementation of all requirements and appropriate risk mitigation and controls. Regulations / Agencies include federal, state, and local agencies. | Security (Operations Services Group) |
| Business Interruption Management and continuity(Risk - Readiness - Response) | Planning for the continuity of business operations including training, crisis management and incident command center operations interface. This includes:<br>- Managing recovery activities following unplanned business interruptions,<br>- Reviews of enterprise state of readiness,<br>- Emergency Response and Life-Safety & Evacuation, and<br>- Interfacing with federal, state, and local external response agencies and contingency planning organizations. | Security (Operations Services Group) / IS |
| Investigation Management | Investigation of any matter of interest to the Company. Examples include:<br>- Violations (or allegations of violations of) laws and regulations, company policy, standards of integrity,<br>- Proactive steps to protect the system such as: daily operations, security audits, vulnerability assessments, and working with outside law enforcement and other groups.<br>- Collection of evidence for possible criminal or civil legal action against SAWS, and.<br>- Threats against the system .. | Security (Operations Services Group) |
| Physical Security and Operations | Routine security patrols or monitoring of transmission and distribution facilities, including substations, performed by security resources should be included.<br>Also includes costs for design, installation and maintenance of security and alarm systems such as CCTV / Video Monitoring, physical intrusion alarms, badging and access control systems. Security Command Center costs should be included in this sub-process. | Security (Operations Services Group) |

## 7.41.2 Results

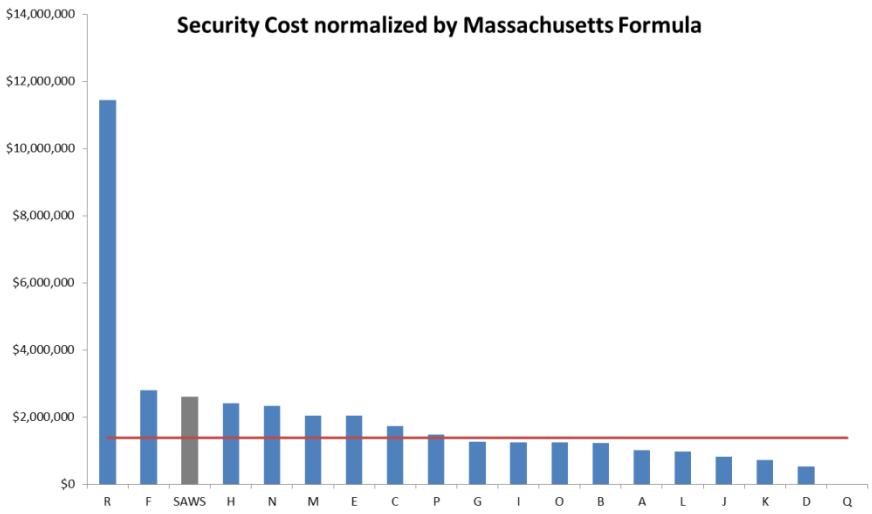
The chart below compares the total cost of providing security related functions per-FTE for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 77: Security cost per FTE**




The chart below compares the total cost of providing security-related functions normalized for SAWS, in the gray bar, with PA's panel of national utilities, shown as blue bars. The red line indicates the median value of these costs.

**Figure 78: Security cost normalized by Massachusetts Formula**




Based on our analysis, security costs are higher than median levels when compared with the PA panel of national utilities, which indicates an opportunity for improvement.

## 7.42 Security Contract Assessment

The table below highlights the current areas where SAWS is employing external contract resources to provide coverage.

**Table 46: Current areas where SAWS is employing external contract resources to provide coverage**

| **Contract Guard Posts** | Hrs | Days |
|---|---|---|
| **HQ - Supervisor** | 24 | 7 |

| | | |
|---|---|---|
| **HQ - Dispatch** | 24 | 7 |
| **HQ - Patrol** | 8 | 5 |
| **HQ – Lobby (2)** | 12 | 5 |
| **Pool** | 12 | 5 |
| **Board Meetings** | 8 | 1 |
| **Agenda Review Meetings** | 8 | 1 |
| **Customer Payment Centers (4)** | 10 | 5 |
| **Treatment Plant (3)** | 24 | 7 |
| **Service Center 1** | 24 | 7 |
| **Service Center 2** | 12 | 7 |
| **Patrols (4)** | 24 | 7 |
| **Totals** | 352 | |

## 7.43 Observations

Security is an important part of water and wastewater utilities, as the service that the utilities provide is essential to the communities they serve. Security cannot be compromised to water supply or chlorination stations.

- However, there seems to be a heavy presence of security in the headquarters and other field facilities, with some being provided almost 24-hour coverage in many instances.
- There seem to be overlaps in responsibilities between physical security and personnel security, even though the staff are separated. For example, physical security is responsible for site assessments, whereas personnel security recommends corrective measures for these sites. A better delineation of roles will allow staff to focus on their priorities and reduce time spent on other areas.

## 7.44 Recommendations and Estimated Benefits

### 7.44.1 Renegotiate Contracted Guards

SAWS spends approximately $1.3 million dollars on contracted guard services. This contract includes more than 80 personnel.

#### Recommendations

Guards can take on some responsibilities, such as providing information about frequently troublesome areas or locations and recommending corrective measures, since they are familiar with the premises that they patrol. Management needs to evaluate where a reduction in the number of guards can be more effective and efficient.

#### Estimated Benefits

Renegotiating the existing guard contract is expected to save approximately $420,000 in annual savings as a result of policy decisions about changing security coverage levels, investment in remote access technologies that would enable administrative personnel to facilitate visitor entry and exit, and as a result of other business decisions that may no longer require security coverage. PA assumed an investment of $50,000 in the construction of new gates and remote gate control to facilitate changes to the guard contract.

## 7.44.2 Realign Roles of SAWS Security Department Staff

Personnel and physical security roles should be better defined. Clarification and realignment of these roles will ensure that there is no overlap between these functions.

### Recommendations

Reorganize personnel and identify responsibilities so that each FTE has a role that is necessary for Security department operations.

### Estimated Benefits

PA estimates that a combination of improving productivity and coverage levels is expected to result in approximately $75,000 in annual savings. It is recommended that proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

# SUPPLY CHAIN MANAGEMENT

## Executive Summary

### Overview

The responsibilities of the supply chain management process at SAWS are organized in two different parts of the organization. The Purchasing and Supply Departments are under the Financial Services group, while Contracting and Contract Administration is under the Legal group. The Purchasing Department is responsible for procuring all goods and non-professional services for SAWS. The Supply Department supports all aspects of the company by issuing, receiving, and replenishing commonly-used items as well as various items that may be required in an emergency. The Contracting Department is responsible for directly soliciting and monitoring either construction activity contracts and/or professional and consulting services contracts.

### Overall Observations

With 48 FTEs responsible for all the supply chain management activities, from a cost efficiency standpoint, PA found that SAWS' total supply chain costs are significantly lower than median cost levels when normalized and compared with the PA panel of national utilities in this area, which is a favorable finding.

SAWS' procurement and contracting costs are slightly higher than median cost levels when normalized and compared with PA's panel of national utilities. This can be attributed to the fact that the competitive bidding process and relatively small size of contracts is a source of inefficiency relative to private sector organizations. PA found that the Texas procurement statutes that govern SAWS limit prequalification of vendors and therefore SAWS is unable to take advantage of some administrative efficiencies achieved by organizations in the private sectors. Effort is required for each project to prepare solicitations as well as review and verify responses. On the other hand, the bidding process and size of contracts does increase the number of firms that are able to participate, thereby increasing competition and driving down prices. The process is popular with small, local vendors and has created value for SAWS ratepayers and the City of San Antonio due to increased competition. But there is an efficiency cost to managing the increased number of smaller contracts, and to managing smaller, and in some cases potentially less experienced, vendors.

## Areas of Excellence

- *Competitive and inclusive bidding process:* The process is transparent and has strong oversight, with input from Purchasing, Contracting, Legal, Engineering, other departments, and the Board of Trustees. In addition, SAWS works with a wide variety of local vendors, and has especially made a successful effort to support Small, Minority, and Woman-Owned Businesses (SMWB).
- *Shortened the time between contract approval and construction start:* SAWS has also done well to make use of the IDIQ and Emergency Contract process to shorten this duration, when necessary. In 2012, SAWS did a rewrite of the General Conditions in its construction contracts. Similar efforts to improve standardized contract language and improve the capability of PRT, C&D, and Governmental Engineering sub-functions to write language and recognize issues will shorten the review period and reduce downstream problems – especially for IDIQ or simpler contracts, which now averages 10.77 days.

## Areas of Potential Improvement

- *Organization:* Having Purchasing, Supply, and Contracting in different parts of the SAWS organization results in some management and administration duplication.
- *Technology:* There is an opportunity for certain system corrections and reporting improvements concerning the Infor Financial Suite (Lawson) and there is also a need to automate aspects of the contracting and contracts management process.

## Recommendations and Expected Financial Benefits

PA has recommendations in the Supply Chain area which are expected to result in approximately $277,000 in annual Operations & Maintenance (O&M) savings through the reorganization of management and staff and examining the group's responsibilities while improving productivity through the implementation of a capital projects management system. It is recommended that these proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

NPV is calculated to be approximately $1.3 million under the following assumptions:

- Steady state timeframe of January 1, 2015 that assumes that proposed resource reductions or re-directions are managed in a non-disruptive manner.
- Benefits accrued between January 1, 2015 and December 31, 2019.
- Discount rate of 5%.
- Inflation rate of 2.5%.

**Table 47: Recommendations and expected financial benefits**

| | Recommendation | Type | Expected Savings |
|---|---|---|---|
| 1 | Combine Management of Purchasing, Supply, and Contracts | Positions | $192,000 in potential savings through organization restructuring |
| 2 | Implement a Capital Project Management System | Process | $85,000 in productivity savings due to reduced manual processing |
| 3 | Increase Contract Approval Levels | Texas Statute – Texas Local Government Code Section 252 | Benefits not quantified |
| 4 | Improve Inventory Turns | Process | Benefits not quantified |

## Introduction

The responsibilities of the supply chain management process at SAWS are organized in two different parts of the organization. The Purchasing and Supply Departments are under the Financial Services group, whereas Contracting and Contracting Administration is under the Legal group.

The Purchasing Department is responsible for procuring all goods and non-professional services for SAWS. The Purchasing staff is responsible for assisting the end user in scope development, developing, issuing, and managing the solicitation, and all award related activities. Purchasing uses the Lawson Procurement system to establish and electronically manage contract parameters. They are responsible for all tasks associated with management of the contract to include change orders and monitoring for Insurance Compliance, through contract completion. Purchasing owns and manages the Lawson Procurement and Supply Systems. Contracting and Purchasing specialists' responsibilities are divided by commodity.

Managing five different locations, the Supply Department supports all aspects of the company by issuing, receiving and replenishing commonly used items as well as various items that may be required in an emergency. The Supply Department also serves as the central receiving and shipping location for each facility. The Supply Department also manages all fueling stations that are owned and operated by SAWS. SAWS utilizes the E J Ward fuel management system and the Veeder Root tank monitoring system.

The Contracting Department is responsible for directly soliciting and monitoring all construction activity contracts and related professional and consulting services contracts. The Contracting Department also utilizes the Lawson Accounting System to enter all contract information and purchase order requests and update this information for all professional service amendments or construction change orders. Each of the members in the Contracting section is assigned a number of contractors to monitor their insurance certificate status for compliance with SAWS insurance requirements. The department is also responsible for ensuring compliance with prevailing wage conditions for all of SAWS construction contracts and ensuring participation of SMWB (Small, Minority & Woman-owned Business) on various solicitations.

Outside this core responsibility, the Contracting Department also manages two other smaller groups which are described below:

- Staff that are responsible for verifying and validating construction contractor pay applications against the quantities installed and verified by the SAWS inspectors (costs included in the Finance process under accounts payable).
- Records Management which handles all aspects of records management for the entire SAWS organization and is responsible for monitoring and replying to all requests for public information under the Texas Public Information Act (Section 552 of the Texas Government Code) (costs excluded from this study).

# 7.45 PA Cost Benchmarking

### 7.45.1 Responsibilities and Sub-Process Definitions

The PA Supply Chain process responsibilities include the following:

**Table 48: Responsibilities and sub-process definitions**

| Sub-Process | PA Supply Chain sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Procurement of Materials & | Managing the procurement process and providing procurement services to procure materials and services for the business. Includes both | Purchasing Department |

| Sub-Process | PA Supply Chain sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| Services | corporate level governance activities and hands on procurement services throughout the corporation. This sub-process includes strategic sourcing activities designed to strategically procure materials and services in line with long term objectives. | (Financial Services)<br>Contracting Department (Legal) |
| Procurement Card Programs | Management and administration of procurement card programs. All fee and administration costs of procurement card programs should be included here. | Accounts Payable (Financial Services) |
| Logistics, including Freight | Managing the inbound freight and logistics for material purchases, as well as the intra-company transfer of materials between warehouse locations. Includes costs of internal company transfers, job site delivery, and arrangement of vendor delivery to job site for large material items, including full vehicle costs. | Supply (Financial Services) |
| Materials Management | Managing and operating of central corporate warehouses where inventory is stored. Includes costs of receiving and issuing materials, inventory counting, receipting of goods, and other operating costs. | Supply (Financial Services) |
| Material Resource Planning and Forecasting | Managing and executing the process by which material planning and requirements are forecasted. | Supply (Financial Services) |
| Contract Management | Administration of Contracts and Contract Management. This includes:<br>- Management of Terms and conditions, verification of insurance coverage and applicable contractor certifications, acceptance terms, and dispute resolution. | Purchasing Department (Financial Services)<br>Contracting Department (Legal) |
| Resource Recovery | Management and operation of resource recovery activities to realize value, including salvage, scrap, obsolete, and surplus items. Credits for scrap metal sales and other recoveries should not be included here. This sub-process should include the internal costs for writing off and disposition of obsolete material, but any cost write-offs should be excluded from the study. | Supply (Financial Services) |
| Supply Chain Support | Supply chain support activities, such as: Vendor Performance Management, Spend Analysis, Budget Management, Reporting, e-Sourcing Support Project Management (e.g. Six Sigma), Program Management (e.g. Staff Augmentation, etc.), Supplier Quality Assurance programs. | Supply (Financial Services) |
| Supplier Diversity and Prequalification | Source and qualify diverse suppliers (minority, women, veteran, etc.) Includes: Compliance reporting requirements associated with supplier diversity programs, Coordinate community outreach efforts and attend trade shows focused on diverse supplier development, identification and matchmaking. Managing relationships with minority and women | SMWB Administration (Legal) |

| Sub-Process | PA Supply Chain sub-process function definition | SAWS Division (or Group) |
|---|---|---|
| | business councils and participate in and support initiatives by these groups. | |

## 7.45.2 Results

The supply chain management process is normalized by spending on Total Goods and Services in 2012. This includes dollars spent on inventory stock, non-inventory goods and services, as well as Capital Improvement Project (CIP)-related projects.

**Figure 79: Supply chain management cost per total goods and services purchased**

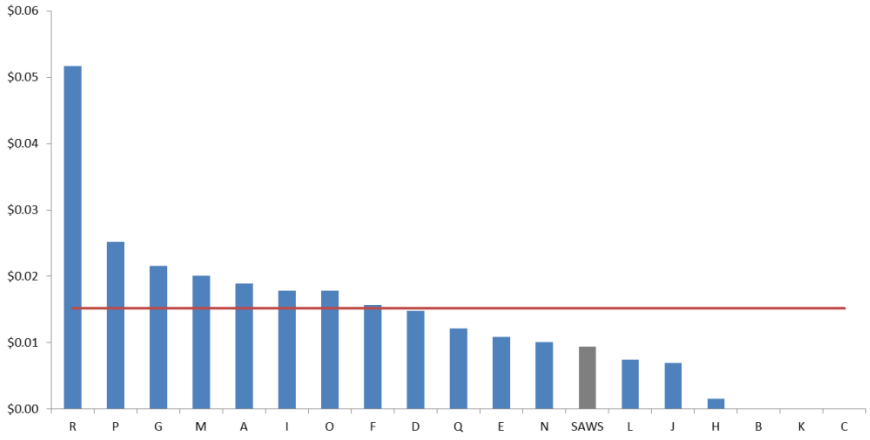
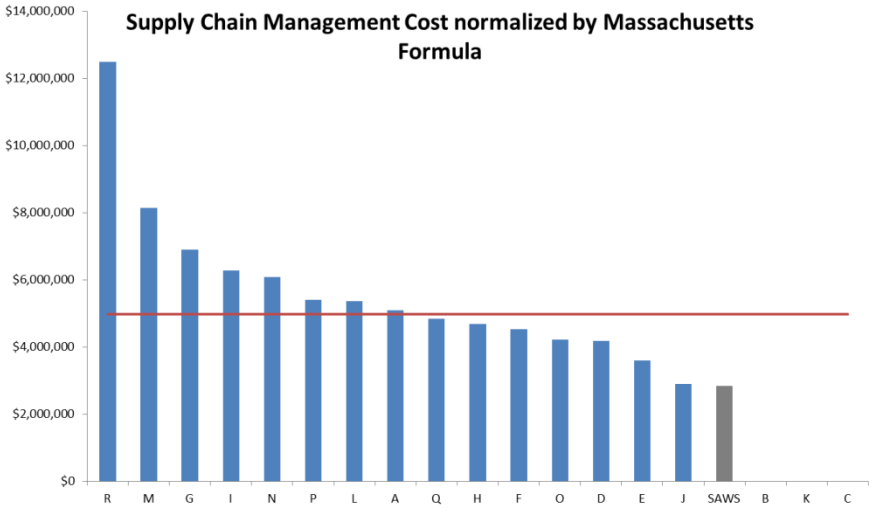



**Figure 80: Supply chain management cost normalized by Massachusetts Formula**




Based on our analysis, total Supply Chain Management costs are significantly lower than median levels when compared with the PA panel of national utilities.

Because SAWS is a municipally-owned utility in Texas, it must follow state and city procurement statutes that define the procurement/purchasing solicitation process. The statutes prescribe the requirements for a governmental entity entering into contracts for goods and services in excess of $50,000, for various types of contracting methods such as competitive sealed bidding (i.e. low bid), best value bidding, request for

competitive sealed proposals, procedures for utilizing alternative delivery methods for certain construction contracts (i.e., Construction Manager at Risk and Design Build), and the specific requirements for advertising bids, accepting and opening bids, surety bond requirements, and other miscellaneous items. Therefore, PA decided to isolate and analyze just the cost performance attributed to SAWS' Purchasing, Contracting Department and Contracting Administration, against the procurement and contract management sub-process of the peer panel utilities to determine its efficiency in light of the requirements.

**Figure 81: Procurement and Contracting cost per total goods and services purchased**

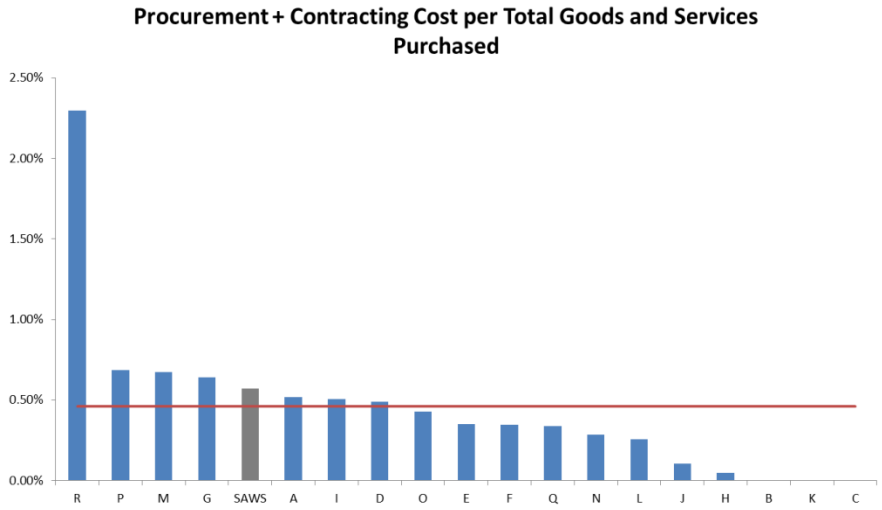
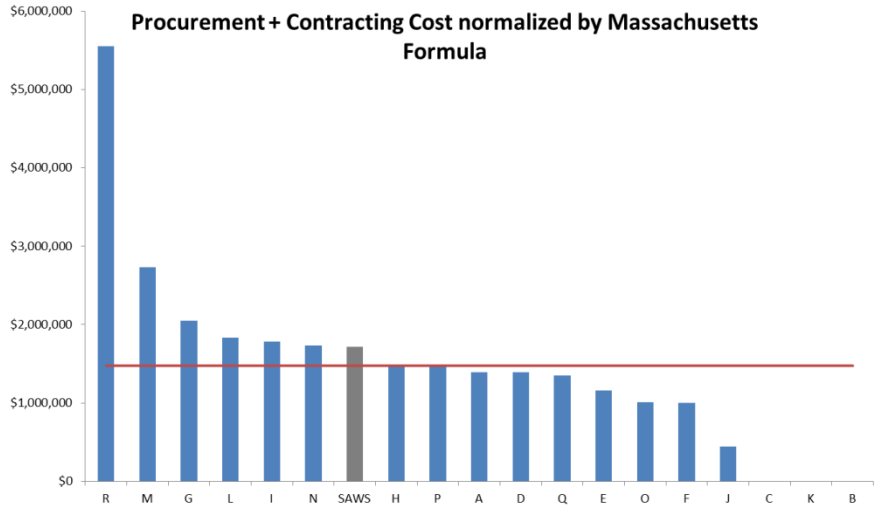



**Figure 82: Procurement and contracting cost normalized by Massachusetts Formula**




Based on our analysis, purchasing and contracting costs are slightly higher than median levels when compared with the PA panel of national utilities.

## 7.46 Purchasing Overview

Purchasing handles annual commodity buys (both inventory and non-inventory) and service contracts (generator repair, plumbing services, etc) through the establishment of annual contracts. Purchasing staff works with the end user to define the scope of work, items and quantities needed, and puts together the Invitation to Bid. Formal bids must be advertised for a minimum of 15 days, and may or may not include

mandatory Pre Bid Meetings, which if needed are facilitated by Purchasing. Upon receipt of bids, responsibility is determined, bid tabulation is generated and award is made to the lowest responsible bidder. Formal awards (exceeding $50,000) must receive Board approval prior to actual award.

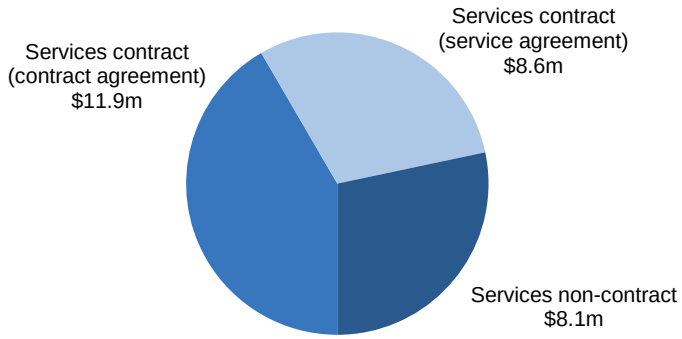
Purchasing is responsible for putting together its Resolution and Consent Agenda monthly for all Purchasing formal awards that fall below three million dollars. Each award is detailed with a brief scope, dollar amount, period of performance and number of extensions.

Purchasing also handles all informal purchases between $3,000 and $50,000 utilizing request for quotes, which are typically issued via electronic means. Once quotes are received and evaluated, Purchasing creates purchase orders from requisitions in Lawson.

The resulting purchases in 2012 totaled approximately $73 million, of which inventory purchase orders were $6.5 million, non-inventory materials purchases were $38 million, and service purchase orders totaled $28.5 million.

- Of the $6.5 million of inventory purchases, $4.9 million was under contract and $1.6 million was non-contract.
- Of the $38 million of non-inventory materials purchases, $21.7 million was under contract and $16.3 was non-contract.
- Of the $28.5 million of service purchase orders, $12 million was Contract Agreements under contract, $8.5 million was Services Agreements not under contract, and $8 million was non-contract services.

**Figure 83: Service purchase orders**




Purchasing handled 633 informal requests for quotes with requisitions between $3,000 and $50,000 in 2012.

There were 231 formal bids issued in 2012 compared with 168 and 170 in 2011 and 2010 respectively.

**Figure 84: Total requisitions**

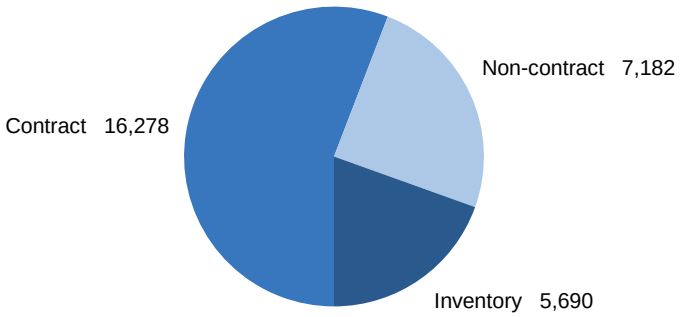
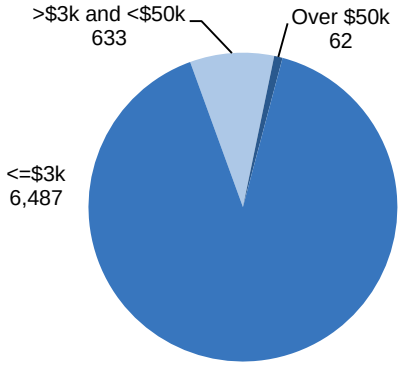


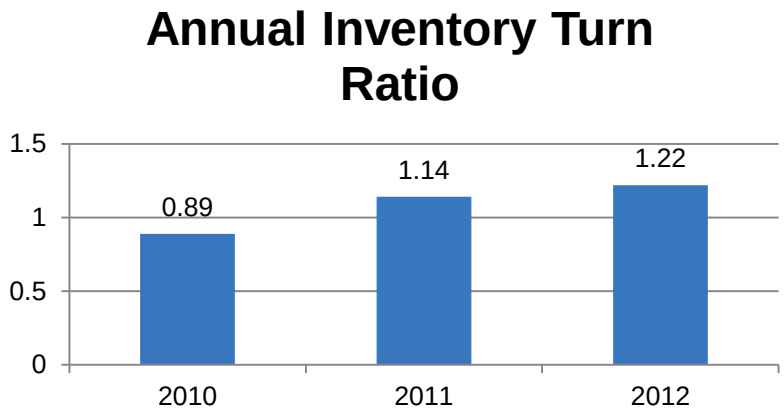

**Figure 85: Non-contract requisitions by dollar amount (k)**




## 7.47 Supply (Materials Management) Analysis

Based on FY 2012 data, SAWS currently maintains an inventory level of between 5 – 6 million dollars a year. SAWS annual turn ratio has been increasing over the last few years. New procedures implemented with a technology upgrade have allowed the Supply Department to move closer to a Just In Time (JIT) inventory philosophy. Using a min/max system of replenishment, each item is reviewed as it reaches reorder levels. The results of these reviews have helped narrow ordering focus to faster moving items and in increase in the inventory turns shown in Figure 86 below.

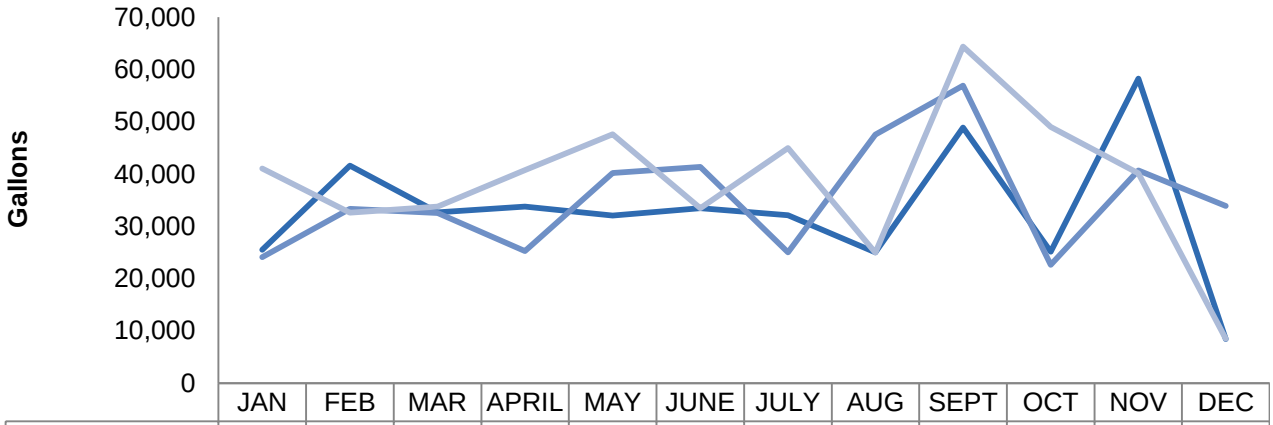
**Figure 86: Annual Inventory Turn Ratio**




Warehouse workers are responsible for issuing all material to crews and processing internal requisitions against inventory. They are also responsible for inventory control, receiving all incoming shipments (stock and non-stock), pulling and receiving internal material transfers, and gathering fuel reading data as required by state statutes. Material Coordinators are responsible for the daily replenishment process.

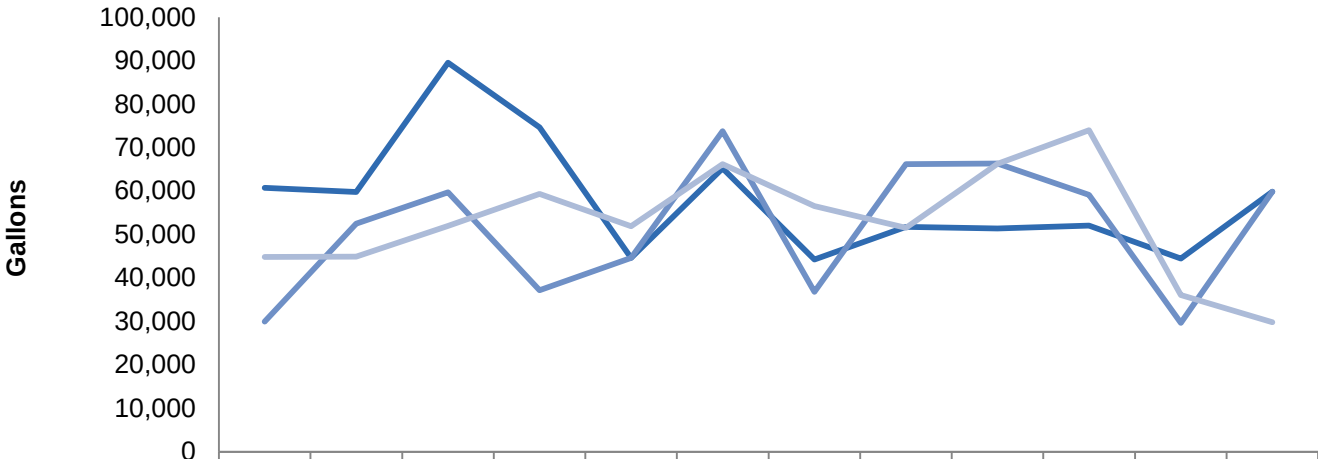
The Fuel Coordinator is responsible for ensuring that the SAWS-owned fueling stations are operational and in compliance with city, state, and federal regulations in addition to monitoring and replenishing fuel supplies at all locations. The charts below show the amount of unleaded and diesel fuel used for the 2010 to 2012 period.

**Figure 87: Unleaded Fuel - Gallons**




| | JAN | FEB | MAR | APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 25,544 | 41,582 | 32,657 | 33,788 | 32,078 | 33,496 | 32,160 | 25,006 | 48,861 | 25,162 | 58,248 | 8,459 |
| 2011 | 24,134 | 33,375 | 32,560 | 25,289 | 40,196 | 41,347 | 25,017 | 47,516 | 56,895 | 22,677 | 40,705 | 33,901 |
| 2012 Actual | 41,088 | 32,594 | 33,788 | 40,742 | 47,606 | 33,470 | 44,968 | 24,971 | 64,345 | 48,997 | 40,163 | 8,496 |

**Figure 88: Diesel - Gallons**




| | JAN | FEB | MAR | APRIL | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2010 | 60,711 | 59,798 | 89,508 | 74,621 | 44,596 | 65,233 | 44,206 | 51,767 | 51,344 | 51,997 | 44,461 | 59,811 |
| 2011 | 29,976 | 52,452 | 59,684 | 37,183 | 44,581 | 73,734 | 36,812 | 66,173 | 66,327 | 59,073 | 29,668 | 59,801 |
| 2012 Actual | 44,843 | 44,859 | 51,963 | 59,309 | 51,849 | 66,175 | 56,502 | 51,528 | 66,255 | 73,993 | 36,068 | 29,829 |

## 7.48 Contracting and Contract Administration Overview

Contracting Department staff serve the organization's requesting departments in the development of Requests for Proposals (RFP), Requests for Qualifications (RFQ), and Requests for Competitive Sealed Proposals (RFCSP) for discretionary contracts, as well as Invitations for Bid (low bid) and Alternative Delivery Methods for construction projects. Contracting staff also provide support in resolving contract disputes on all types of contracts in order to ensure the consultant/contractor complies with the terms and conditions of the contract and ensure any conflict is mutually resolved by all parties.

Contracting staff work very closely with the Engineering and Construction (E&C) Department. The Contracting Department completed $228 million in solicitations in 2012. Of that amount, approximately 98% was for CIP related projects, and the remainder for other projects across SAWS.

### 7.48.1 Professional Service Solicitations

The design of each solicitation for engineering design services and other consulting services requires a great deal of professional judgment and experience. Most every solicitation document is different, with variations in scope, evaluation criteria, insurance requirements, and require meeting with end-users to develop the document. Many times, contracting staff perform a certain amount of research to review scopes of work for the RFP/RFQ documents from other public agencies to determine business/market conditions and to locate standard language for the solicitation.

For professional services solicitations, the average development time is 6.5 days from the initial meeting with the requesting department until the solicitation is published on the SAWS website. Some solicitations take longer when the request is unique, and additional time is needed with the requesting department to ensure the solicitation scope of services is adequately described and the evaluation criteria meet the needs of the evaluation committee.

When a firm or firms have been identified for recommendation to the Board of Trustees, the final negotiations will be conducted with those firms. This timeline differs depending on the complexity of the project; however, these negotiations are usually handled through the requesting department.

Once the final scope of services is negotiated with the compensation schedule, the Contracting department will review and ask for clarifications to finally develop the contract for the project. SAWS Legal review follows and all clarifications or modifications to the scope, term, and compensation are routed for the requesting department's approval, as well as the approval from the consultant. After the recommended firm is presented for consideration and approved by the Board of Trustees, the final contract documents are sent to the consultant for contract signature, as well as the request for the insurance documents that correspond to the contract requirements.

Upon receipt of the contract and insurance documents, the Contracting staff will have the insurance certificate evaluated by an outside evaluation service. After the insurance documents are found to be compliant with the contract requirements, the contract will be signed by the authorized individual at SAWS. The Contracting staff actively monitors insurance compliance for all contracts to ensure firms maintain their lines of coverage for the term of the agreement.

The SMWB involvement for the past two calendar years is as follows for design activities:

**Table 49: SMWB involvement**

| Year | Total Awards | Non-SMWB | Small Business | Hispanic Business | African American Business | Other Minority Business | Woman Owned Business |
|---|---|---|---|---|---|---|---|
| 2011 | $22.8M | 51.2% | 0.65% | 11.8% | 1.8% | 14.3% | 20.2% |
| 2012 | $22.2M | 46.8% | 4.3% | 16.8% | 1.5% | 16.4% | 14.2% |

## 7.48.2 CIP Construction Management

When engineering designs are completed, they are submitted to the Contracting department to begin the process of reviewing the project requirements and preparing the construction project for advertisement. Most construction contracting is done through Invitation for Bids (IFBs). SAWS is required to award contracts to the lowest responsible bidder, subject to confirmation that the bid submitted meets SAWS requirements for a responsive bid. The exception to this process would be for projects solicited under Alternative Delivery Methods, which include Request for Competitive Sealed Proposals, Construction Manager at Risk, or Design Build, and projects where SAWS elects to enter into a joint bidding process with other government agencies. The other governmental agencies will add the SAWS line items to their project and competitively bid the overall project.

The process also differs slightly for emergency work; however, these projects do not occur very frequently. These situations generally entail SAWS crews stabilizing the immediate emergency situation and allowing the engineering group to prepare biddable construction documents for contractors to competitively bid upon. The Contracting department contacts three to four contractors (at least two SMWB contractors) to participate in a site visit to the emergency site and the distribution of plans and specifications for the project. The competitive bidding process is generally completed within 36 hours and the contractor is provided with a notice to proceed within 48 hours. Listed below is the number of emergency projects for 2011 and 2012:

**Table 50: Number of emergency projects for 2011 and 2012**

| Year of Award | Total # Construction Projects Awarded | Total # Emergency Projects Awarded | % Emergency Projects |
|---|---|---|---|
| **2011** | 43 | 1 | 2.33% |

| | | | |
|---|---|---|---|
| **2012** | 56 | 3 | 5.36% |

*Source: Information provided to PA by SAWS Contracting on 8/12/2013*

To address construction projects in a timely manner, SAWS uses work order contracts (also known in the industry as Indefinite Delivery, Indefinite Quantity (IDIQ) contracts). For work order contracts, contractors bid on line items representing specific types of work, such as replacing a certain number of feet of 8 inch water main, before knowing the exact project date or location, and are then called as needed. SAWS has effectively used these types of contracts to meet the construction needs on government type projects, as well as SAWS projects that are relatively small and need immediate attention. SAWS has worked to incorporate lessons-learned on previous work order contracts to ensure these types of contracts are delivering construction projects in the most cost efficient and time sensitive manner.

The SMWB involvement for the past two calendar years is as follows for construction activities:

**Table 51: SMWB involvement**

| Year | Total Awards | Non-SMWB | Small Business | Hispanic Business | African American Business | Other Minority Business | Woman Owned Business |
|---|---|---|---|---|---|---|---|
| 2011 | $135M | 77.6% | 7.1% | 7.7% | 0.2% | 0.9% | 6.8% |
| 2012 | $209M | 71.2% | 10.5% | 10.8% | 0.6% | 0.79% | 6.1% |

SAWS has also done well to make use of the IDIQ and Emergency Contract process to shorten the time between contract approval and construction start dates when necessary.

## 7.49 Observations

From a cost efficiency standpoint, the SAWS' supply chain management costs in total are lower than median levels when compared with the PA panel of national utilities.

- SAWS follows clear procedures regarding procurement of goods and services.
- While SAWS currently uses Infor Financial Suite (Lawson) for its purchase order and requisition process, it does not currently use any automated systems to administer and manage its contracting system. Therefore, all activities related to proposal development, advertising, proposal receipt, vendor selection, contracts execution and award, and post-execution contract performance management are handled manually. This manual process increases the lead time to undertake a contract.
- While the electronic approval process in Lawson, once set up, is effective, the process for assigning or changing approvers is manual and can result in errors.
- The lack of a capital project management system also results in several activities and manual steps in the area of verifying and validating construction contractor pay applications against the quantities installed and verified by the SAWS inspectors. While PA was made to understand that this change has resulted in improved accuracy in vendor payments, lack of automation and technology consumes labor time.
- Although effective at accelerating construction start dates, IDIQ contracts present challenges for construction inspection. Because contractors have been required to bid without details such as location, these contracts can lead to questions that require additional time and effort from inspectors. PA found that there have been instances of confusion among inspectors, Engineering, and Contracting regarding what changes are acceptable. Contracting and E&C should continue to track and learn from common points of contention, increase the clarity of IDIQ line items, and improve internal communication to reduce downstream problems.

- The length of the contracting process continues to present challenges, especially given that IDIQ contracts are often not appropriate. In addition to improving visibility and coordination between Contracting and E&C, we recommend exploring other opportunities to streamline contracting processes. For example, in 2012, SAWS did a rewrite of the General Conditions in its construction contracts. Similar efforts to improve standardized contract language could shorten the review period.
- Opportunities for administrative efficiencies are limited by state statutes concerning contracting requirements.

# 7.50 Recommendations and Estimated Benefits

## 7.50.1 Combine Purchasing, Supply, and Contracts Under Single Management

Locating the functions in different parts of the organization (Purchasing, Supply, and Contracts under single management) contributes to duplication of management and administrative overhead.

### Recommendations

PA recommends combining the three functions under single management.

### Estimated Benefits

Consolidation under single management of the above functions is anticipated to result in approximately $192,000 in savings through the reorganization of management and staff and examining the group's resources and responsibilities. It is recommended that these proposed resource re-directions be managed in a non-disruptive manner over an 18-month period.

## 7.50.2 Implement a Capital Project Management System

While the benefits of a capital project management system will be most felt by the E&C Department, one can expect benefits to also affect the Contracting Department due to elimination of certain paper-based and duplicative activities such as having to enter and/or retrieve vendor information and job details from different locations.

### Recommendations

PA recommends that SAWS implement a capital project management system so that E&C can benefit from streamlined operations and the Contracting Department can keep track of vendors in one location.

### Estimated Benefits

Successfully implementing such a system should result in savings of approximately $85,000 as a result of improved productivity due to reduction in manual processes and improved productivity from staff in this area. It is recommended that proposed resource reductions or re-directions be managed in a non-disruptive manner over an 18-month period.

## 7.50.3 Increase Contract Approval Levels

All purchases or contracts that exceed $50,000 need to be authorized by the SAWS Board. This is driven by state statute of seeking approval for contracts greater than $50,000. The City of San Antonio also has this constraint.

### Recommendations

While a change in authority level or a delegation from the Board will be challenging and may not take place until at least 2015, per our understanding, it is worth pursuing, since it would reduce the processing

time for procurements in addition to cost of procurement. The current $50,000 authority threshold is low for an organization with over $400 million in operating spending, a third of which is for goods and services, and over $300 million in capital spending (most of which is for professional services, engineering, and architectural services). Further, since the SAWS Board meets only once a month, this restriction can bottleneck projects awaiting award of contracts by the Board.

### Estimated Benefits

PA has not quantified specific benefits attributed to increase in contract authority levels but one can assume that this would result in a reduction in effort required to prepare Board agenda items and the associated activities.

## 7.50.4 Rationalize Warehouse Inventory and Improve Turns

The average inventory turn was 1.22 in 2012. While traditionally, water and sewer utilities have maintained high inventory levels to ensure high availability, this trend is fast changing with the advent of better sourcing tools and improved supply chain management.

### Recommendations

PA recommends SAWS conduct a comprehensive inventory assessment to determine current stock levels, obsolete materials, and identify target inventory turns by material type.

### Estimated Benefits

PA has not quantified specific benefits attributed to improving inventory turns but one can assume that this would result in a one-time cash benefit, especially due to the sale of certain types of obsolete materials and will also result in more efficient inventory management practices.

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**Corporate headquarters**
123 Buckingham Palace Road
London SW1W 9SR
United Kingdom
Tel: +44 20 7730 9000

**United States headquarters**
45th Floor, Chrysler Building,
405 Lexington Avenue,
New York, NY 10174
Tel: +1 212 973 5900

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