

US EPA ARCHIVE DOCUMENT



United States
Environmental Protection
Agency

CASE STUDY

City of South San Francisco Sewer System Asset Management Planning

Introduction

With aging infrastructure and limited budgets, municipalities have a difficult task of managing their systems while maintaining a desired level of service to their customers. Asset management planning is a tool many wastewater districts are starting to use to manage their sewer systems.



South San Francisco's wastewater collection system includes about 120 miles of sewer pipelines, serving a population of 65,547. The sewer system averages a daily dry flow of 8.3 MGD and an average daily wet flow of 10.8 MGD. Aging infrastructure and limited budgets have caused more cities to turn to asset management planning to uphold current levels of service. The city implemented a Sewer System Management Plan for their sewer system in 2005 to comply with the State of California's General Waste Discharge Requirements. Part of the plan is to do a risk management of the system which looks at where failure would have the greatest impact. By knowing which assets are more prone to failure they can be monitored more and replaced before they fail.

Sanitary Sewer Asset Management Goals

To maintain a set level of service, the city established a list of goals they wanted to fulfill as part of their asset management plan. The goals of South San Francisco's Sanitary Sewer Asset Management Plan are to:

- Properly manage and operate the city facilities to minimize SSOs.

- Implement regular, proactive maintenance of the system to prevent blockages that may cause sewer backups or SSOs.
- Provide adequate capacity to convey peak wastewater flows.
- Protect public health and safety.
- Perform all activities in accordance with safety policies and practices.
- Protect bay waters and tributaries within the city's service area.
- Retain qualified employees who are well trained and certified in Collection System Maintenance.
- Uphold city standards and specifications on newly constructed public and private sewers.
- Preserve the city's capital investment in the sanitary system to assure maximum system service life.

In order to achieve their goals, the city conducted risk management, asset condition, maintenance, and financial management analyses.

Risk Management & Asset Condition Assessments

South San Francisco maintains a GIS database and maps of its sanitary sewer assets. This information is used for tracking maintenance, service requests, work orders, SSO history, cleaning, repairs, and inspections. The city used the NASSCO standards and history of the system to evaluate the value of their system.



The city has implemented a FOG program since 1998 for food service establishments and found that 72% of the food service establishments have grease removal devices in operation. As a result of their asset condition assessment, beginning in 2010 the city has required all building permits for facilities that have grease generating activities to install a grease interceptor. Additionally, the city has increased inspections and enforcement while distributing FOG management pamphlets and other educational materials to minimize the amount of FOG in the sewer system.

Maintenance Analysis and Planning

Prior to implementing their sewer system management plan, the city had maintained their collection system using a simple routine cleaning schedule. Now, with help of new technology, the city has implemented a more sophisticated strategic cleaning schedules. The city has a Computer Maintenance Management System that tracks maintenance activities, service requests, work orders, SSO history, sewer line cleaning, sewer line and manhole repairs, sewer line CCTV inspections, gravity and force mains and sewer line rehabilitation and replacement projects. Hot

Spot Cleaning Work Plan (HSCWP) identifies system pipeline problems and uses the best method to resolve the issue. The HSCWP uses the observations of the cleaning crews to know the condition of the assets. Cleaning schedules consist of quarterly, 6 month and annual



cleanings, with the frequency depending on the asset's history of blockages. Manholes are also inspected during pipe cleanings and pump stations are inspected daily and monitored 24/7. These programs allow the system to operate at the intended design flow by preventing backups. This has enhanced the performance of the system, lowered O&M costs, extending the life of the sewer system, and lowered repair, rehabilitation, and replacement costs. In addition to blockage history, cleaning of lines is also based on inspection data, pipe age, material and slope

that would indicate frequent cleaning is needed. In 2013, 15-20 miles of the system was inspected with video and 60 miles of the system was cleaned. The city wants to inspect and clean more of their system every year so that they can maintain the same level of service to their customers.

Financial Management

The sewer system is funded through a sewer enterprise fund, which is composed into four different funds. The Non-Major Governmental Funds are fees paid by developers used to fund capital expenditures that improve the sewer infrastructure. The Major Government Funds are revenues and expenditures associated with the acquisition, construction or improvement of city owned assets. The Proprietary Funds are user charges supporting the operation, maintenance, and capital renovation of the sewer system. The Non-Major Proprietary Funds are revenues paid by users for first time connections to the sewer system or by users who increase their sanitary sewage use. The Operation and Maintenance of the system costs \$1.7 million annually. Factors that affect the operational costs of the system include the history of the system, hiring new employees, using new processes, and buying new equipment. As technology advances the operation costs of the system will fluctuate. An example of this is that the city bought a new machine that does spot repairs in the sewer system. The initial costs was high but the cost of each repair is cheaper, because no digging is required. By integrating financial projections, initial capital costs were justified to increase short-term budget in order to minimize long-term expenditure.

Results

Implementing an asset management system has resulted in numerous benefits for the City of South San Francisco including the ability to manage their system in real time, the establishment

of a more proactive maintenance plan, and the ease of being able to quickly access information previously unavailable. The largest overall benefit, however, has been the gradual system performance improvements as a result of asset preservation and replacement.

U.S. EPA has a strong interest in working with State regulators and municipalities to find solutions to encourage asset management planning for stormwater, wastewater, and drinking water systems. EPA is encouraged by the progress demonstrated by the City of South San Francisco and hopes to work with other municipalities and regulators to achieve similar success.

For More Information on the City of South San Francisco Asset Management Plan:

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