WSSC Achieves Over 60% Reduction in Hydraulic Plan Review for Water and Wastewater Systems

Helped Complete Hydraulic Plan Analyses More Efficiently than WSSC’s In-house System

Hydraulic Plan Review Scope

Washington Suburban Sanitary Commission (WSSC) Development Services Group reviews hydraulic plans for approximately 160 proposed development plans per year. This includes water and sewer system extensions as well as approximately 172 small-site utility plans (commercial private systems) that connect to the existing water and sewer network in two large Maryland counties.

Each system extension is hydraulically reviewed and mains are properly sized by WSSC hydraulic engineers during the hydraulic plan analysis (HPA) process. In this process, engineers use hydraulic-grade benchmarks developed by the planning group within the existing system to analyze the proposed extensions and connections. These benchmarks are developed using system-wide modeling while considering the severest conditions in the system.

The WSSC hydraulic engineers determine the appropriate sizes for the proposed mains while considering various scenarios that focus on the system integrity and future needs to provide adequate fire flow and pressure to new developments.

When the creation of a new pressure zone is sometimes required to serve a new development, the hydraulic reviewer interacts with the planning group that models the system-wide network to help with zone creations.

The project’s overall goal was to increase customer service levels by implementing a workflow process improvement. To meet this goal the Development Services Group implemented Bentley’s WaterGEMS® and SewerGEMS® to increase the turnaround time on reviews and keep pace with one of the most rapidly developing areas in the United States. The reviews were critical to the success of the projects as they serve as the primary planning mechanism for growth.

Increased Review Efficiency

Prior to using WaterGEMS and SewerGEMS the Development Services Group completed the hydraulic plan analyses with small-scale software developed in-house that was less advanced and less user-friendly.

Through the use of WaterGEMS and SewerGEMS, as well as group restructuring, the Development Services Group increased review efficiency through a standardized model between projects, improved quality assurance of reviews, and reduced review cycle times from an average of 73 days to 27 days for moderately complex projects over eight years, despite a two-fold increase in reviews.

Fast Facts

- WSSC Development Services Group reviews and analyzes 160 large development and 172 private development systems annually for hydraulic adequacy.
- It was critical that the review process and turnaround to the development engineers be completed as quickly as possible to keep up with the rapid pace of development in one of the fastest growing areas of the country.

ROI

- The overall efficiency improvement for the hydraulic review of development projects along with internal group restructuring decreased review cycle time from an average of 73 to 27 days.
- The workflow process improvement allowed revenue collection to be expedited, by allowing more customers to connect to the system sooner.

Project Summary

Organization: Washington Suburban Sanitary Commission (WSSC)
Solution: Water and Wastewater
Location: Maryland, United States

Products used:
- WaterGEMS, SewerGEMS

Plan review workflow improvement charts
The following examples illustrate review time improvements:

- **WaterGEMS** and **SewerGEMS**’ scenario and alternative capabilities allow organized and systematic modeling, so other reviewers can view the model from where the original reviewer left off. And because model scenarios are created for each development phase of a project phase, each project can be reviewed for hydraulic integrity and adequacy easier and faster. This means that the developers who choose to proceed with a partial release of project phases can receive a quicker response from WSSC.

- Environmental issues can also cause development engineers to re-consider alignments midway through the design process. Because hydraulic engineers have developed consistent models for each proposed development and system extension, the amendments to original alignments can be rapidly adjusted and re-analyzed. This means development engineers can make changes based on environmental issues more quickly and with less review time.

- **The Development Services Group** can also be more responsive to system inspection changes during the construction process as they have access to the completed models.

On a larger scale, the increased review efficiency is improving customer service and the overall delivery speed of an estimated 160 annual development projects from planning and design phases to construction-ready status. And because construction began sooner, revenues (through permit fees or new billing accounts) were collected sooner.

### Safer Water and Sewer Infrastructure

Adequate fire flow is essential for safety. The fire flow capability in **WaterGEMS** enabled reviewers to perform fire flow analysis for numerous locations throughout a large or small network used for a project in a single run.

Reviewers were able to model multiple scenarios under various system outage conditions, including routine inspections of large diameter pre-stressed concrete cylinder pipe (PCCP) mains, to optimize the best solution that allows adequate fire protection.

Using **SewerGEMS** also enabled WSSC to analyze system issues in wastewater infrastructure during the development process. This resulted in a better quality hydraulic design and ultimately protected the environment from future sanitary sewer overflows in new development areas.

### Reduced Project Delivery and Operation Costs

**WaterGEMS** reduced the time needed to accurately size pipes to meet WSSC’s system constraints and standards. This resulted in faster communication and turnaround to consultants and developers. **WSSC** can easily access the developed models and incorporate proposed pipelines within a development with existing pipelines in WSSC GIS container. **WSSC** improved workflow efficiency with more than an estimated 60 percent reduction in review cycle times for hydraulic analyses of development and system extensions.

**WaterGEMS** model with various fire flow scenarios