

*The state of California has been experiencing serious drought conditions for three consecutive years now, and the California Department of Water Resources predicts 2009 could be the worst drought year in the state's history. In light of such dismal predictions, Gov. Arnold Schwarzenegger proclaimed a state of emergency within California on Feb. 29, 2009. As a result, utilities throughout the Golden State are making their best efforts to conserve water supplies and monitor usage.*

By Stephanie Harris

# fostering Savings



Tree roots near old meters have posed a replacement challenge, but to date, Foster City has installed about 2,000 new meters.

Foster City, Calif., experiences water usage and operation efficiency improvements as a result of its new AMI system

Water metering is proven to be one of the most effective means for municipalities and customers alike to monitor water consumption and promote water conservation efforts.

### Achieving Efficiency

Located in the Bay Area, 25 miles south of San Francisco, Foster City, Calif., is addressing water usage issues and achieving operational efficiency with the implementation of its new advanced metering infrastructure (AMI) system. In 2007, the city began upgrading its aging metering system—which is reaching the end of its 20-year life cycle—by replacing old meters and infrastructure with the new FlexNet AMI system by Sensus.

According to Ignatius Nelson, Foster City Public Works superintendent, “The city then began putting money into a meter replacement fund and in 2006, was in need of new meters.”

Foster City was on the lookout for a new metering system and according to Nelson, was inspired by a newly installed metering program in Santa Cruz, Calif.

“[Santa Cruz] had an AMR system with drive-by meter reading, and it sort of inspired us,” he said. “Foster City agreed to install new meters in 2007, which was about the time when the FlexNet system came to be.”

FlexNet is a high-powered, tower-based system (transmitting up to 2 Watts of power) with a two-way AMI fixed network.

“It operates on primary-use frequencies, and we are the sole owners of that,” said Tom Galuska, AMI marketing manager for Sensus. “This means no one else is allowed on the frequencies, which is important for security and reliability.”

With the FCC-protected primary-use license spectrum, utilities are guaranteed to receive data over protected clear airwaves. The system also has the ability to provide hourly meter readings and rapid leak alerts.

### Metered Improvements

Foster City began replacing outdated meters and installing the new FlexNet system throughout its 4-sq-mile service territory in fall 2007. When installation is complete, there will be approximately 8,600 total

meters all serviced by one Tower Gateway Basestation (TGB), which is placed atop City Hall in the center of the city. The topography of Foster City is predominantly flat, which has enabled the utility to use only one tower, according to Nelson.

Foster City has upgraded meters in the city's numerous parks and is working on residential upgrades. So far, roughly 2,000 meters throughout the service area have been successfully updated with FlexNet SmartPoints.

“It's an ongoing process, but it should be complete within the next four to five years,” Nelson said. “We are installing about 30 to 40 new meters per day, and that's using two crews. It could be done much more quickly but we're doing the replacements ourselves, which saves a lot of money.”

The challenge Foster City has encountered with the meter replacements to date has been with tree roots near the old meters, according to Nelson.

And the city is already experiencing water savings as a result of the new meters. “With the older meters,” Nelson said, “we were seeing rates of about 10% unaccountable water. We're now at 7% to 8% unaccountable water as a partial result of installing the new meters, so water monitoring is improving.”

The amount of data the AMI network provides allows utilities to continuously improve their operations. “Utilities are able to assess their unaccountable water,” Galuska said. “They know from a daily standpoint how much water is being used because with the new AMI meters they're getting data on customer usage on a daily basis, and they can take that data and do a better job at addressing water loss. There are other features they can incorporate as well, such as leak detection on water distribution lines and applications that enable utilities to be proactive on leaks instead of waiting until the pipe breaks—they can now monitor all of that information over the network.”

The system also has a large bandwidth, allowing utilities to expand capabilities over time as new technologies emerge in the marketplace.

Foster City has integrated the FlexNet meter reading results into their existing water billing system to ensure no data entry is required, and much of its information is on GIS. This system provides an



Foster City replaced its 4-sq-mile service area's outdated meters with a two-way AMI fixed network.

abundance of data and breaks it down into several reports, such as water usage, time of use and financing information.

“In San Francisco, they have mandatory water use where you can only water your lawn on certain days at certain times,” Nelson said. “Foster City is on a voluntary 10% water use reduction, but if we ever move in that direction we will now be able to easily abide.”

And because all of the meters are on GIS, Foster City can view aerial photos of each meter, allowing staff to know its exact location in the event that service is required and whether or not it is near a tree, according to Nelson. He said he has the ability to read all of the meters on the network within moments—a big change from the old method of meter reading by hand.



In addition to receiving detailed information on water usage, which will facilitate water conservation, customer service will also benefit as a result of the new system. Foster City currently reads and bills water meters on a bimonthly basis, but it will soon have the ability to move to monthly billing, if desired.

With the amount of data available, utilities have the ability to be creative with their use of information. “The utilities that are using the system are really finding new ways to make use of the data,” Galuska said. “They’re actually being more creative with the data and making more uses for it than we ever even thought of.”

In order to facilitate a smooth transition to the new information system, Nelson recommends utilities be involved with their IT department throughout the entire process. “It’s important to have your IT department involved from the get-go,” he said, “because they have to prepare the different reports and implement the new system with the finance department.”

The endpoints of the system have a 20-year battery warranty—10 years full and 10 pro-rated. “You’re going to have to change some hardware over time, maybe with the TGBs, which is just normal maintenance,” Galuska said, “The collection network may require periodic firmware updates and routine maintenance but the endpoints are designed to last 20 years.”

The FlexNet system has the flexibility to be used in both urban and rural applications, as the receivers placed on the TGB towers are very sensitive and can read over many square miles, according to Galuska.

There are also several benefits of the system, all depending on what a particular utility is looking

to do. “If it’s a reduction of labor, then this eliminates meter readers,” Galuska said. “It saves costs on gas usage for vehicles, it cuts down on people getting hurt—medical claims, disabilities, dog bites—it allows you access to locations that you weren’t always able to get into.”

The leak-detection feature also allows utilities to be proactive with customers. If a utility thinks a resident might have a leak in their home, it can provide services to help them conserve their water usage. “From a conservation standpoint,” Galuska said, “that’s good for the whole environment, the end customer and the utility because they are now able to minimize waste of water.” [www](#)

**Stephanie Harris is associate editor for *Water & Wastes Digest*. Harris can be reached at 847.391.1007 or by e-mail at [sharris@sgcmail.com](mailto:sharris@sgcmail.com).**

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