

MUNICIPAL

SEWER
&

WATER™

FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS

September 2008

www.mswmag.com

HUMAN SIDE: THE VALUE
OF JOB SHADOWING

PAGE 90

TECHNOLOGY TEST DRIVE:
MONOFORM MANHOLE
REHAB SYSTEM

PAGE 42

UNSUNG HERO: A CREW LEADER
IN OREM, UTAH, EARNS PRAISE

PAGE 40

2008
BUYER'S
GUIDE

PAGE 56

PERIOD OF DISCOVERY

A Rhode Island city turns
an EPA mandate into
an improvement opportunity

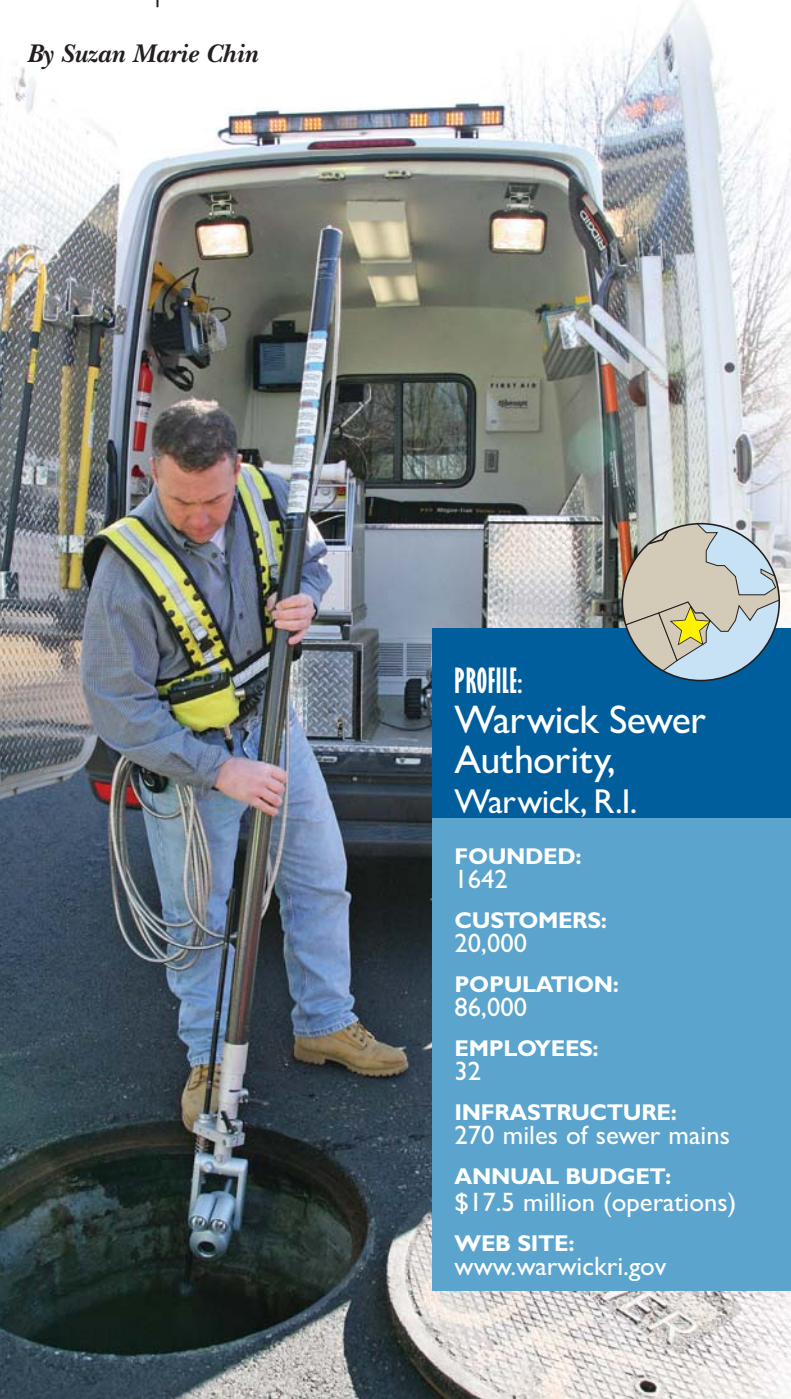
PAGE 16



PERIOD OF DISCOVERY

An EPA mandate forces a Rhode Island community to examine sewer operations and discover hidden weaknesses and valuable strengths

By Suzan Marie Chin



PROFILE:
Warwick Sewer Authority,
Warwick, R.I.

FOUNDED:
1642

CUSTOMERS:
20,000

POPULATION:
86,000

EMPLOYEES:
32

INFRASTRUCTURE:
270 miles of sewer mains

ANNUAL BUDGET:
\$17.5 million (operations)

WEB SITE:
www.warwickri.gov

When the U.S. EPA ordered the Warwick Sewer Authority (WSA) to develop a plan to assess the adequacy of its collection system maintenance programs, Mathew Solitro's first response was, "You've got to be kidding."

But now, "We see it as a bit of a blessing," says Solitro, program engineer for the authority, which serves the city of Warwick, R.I.

The EPA, with the Rhode Island Department of Environmental Management, had been issuing such mandates throughout the state in an effort to improve water quality. When Warwick's turn came in August 2007, the WSA decided to use it as the impetus for rigorous self-examination.

The result was a comprehensive Capacity, Management, Operation and Maintenance (CMOM) program that includes scheduled CCTV inspection of the entire system, a cleaning and flushing program that works in tandem with inspection, and compilation of inspection findings and all asset information in a GIS database.

Mat Solitro, program engineer for the City of Warwick, operates a QuickView zoom camera from EnviroSight to assess pipe condition. Inspection data helps the city with infrastructure mapping as part of a Capacity, Management, Operation and Maintenance (CMOM) initiative. (Photography by Donna Conde)



The city's pole-mounted zoom camera enables inspections of pipes from street level.

In place for just under a year, the program is not only helping Warwick meet its mandate but also providing a method for spotting maintenance procedures that need improvement, and a roadmap for maintaining the system in the future.

Shifting to proactive

Until recently, the authority did not have a scheduled inspection or flushing and cleaning programs in place for its 270-mile system. The limited equipment on hand, including a 1991 Vactor combination cleaner with only a few types of cleaning nozzles, was used mainly to address problems and respond to emergencies.

Agency leaders felt the authority was doing a fair job of correcting blockages with high-pressure jetting, but they had nagging doubts about the long-term effectiveness of their efforts.

The mandate changed all that.

REGARDING SIGHTS

When faced with an EPA mandate, the Warwick Sewer Authority (WSA) performed a rigorous self-examination and started a comprehensive CMOM program that caught the attention and admiration of local EPA officials.

As the second largest community in Rhode Island, serving a customer base of 20,000, Warwick was much like its neighboring communities facing similar mandates. The city's program was a working example of how a municipal agency with limited funds and staff could comply with environmental mandates and create a manageable sewer collection system maintenance program.

Therefore, the EPA asked WSA to create an educational program to present at the Rhode Island EPA facility, where other communities and sewerage agencies could learn about Warwick's program firsthand.

"Since everyone in the region was getting the same EPA mandate at roughly the same time, all of the communities saw the importance of pooling their resources and ideas on how to deal with and answer this order," says James Feeney, WSA program director.

WSA presented a hands-on demonstration of its inspection equipment and GIS program and how all elements work together to help the agency stay in compliance and meet its management goals. Other agencies were encouraged to use the information to develop or improve their CMOM programs.

The EPA program was so well received that the Rhode Island Department of Environmental Management asked WSA to conduct a similar demonstration for its Wastewater Superintendents' Boot Camp for future wastewater management personnel.

"We fell into a few things for our program purely by luck, but overall, our small team's efforts have put us ahead of the pace of some other communities in the area," Feeney says. "We've been asked to answer a lot of questions, and we're glad to help our neighbors meet their challenges by sharing our experience through these educational presentations."

It required WSA to complete a Wastewater Collection System Capacity, Management, Operation and Maintenance Program Self-Assessment Checklist — and it opened the staff's eyes in many ways.

"The checklist was something that made us think about a lot of things that, although we were aware of them, we never really sat down and thought about in detail," says James Feeney, WSA program manager. "We knew that adding an inspection component and CCTV to our plan was essential, but the checklist made us think how we could use that CCTV to improve our maintenance procedures like cleaning and flushing."

Feeney and Solitro devised a plan that has their inspection vehicle work alongside the combination truck. Before they had the

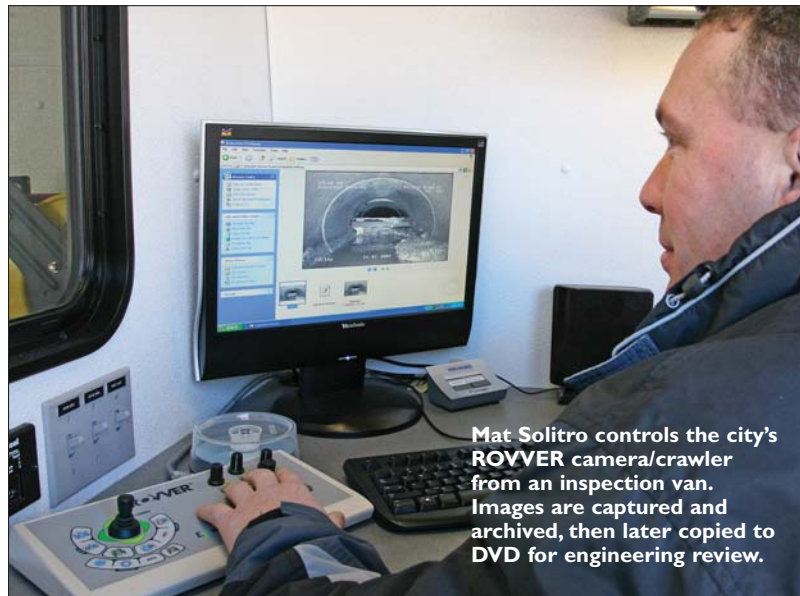
camera, crews would jet a line using what seemed to be the proper nozzle, watch at a downstream manhole for debris from the blockage to pass through (such as roots, grease or silt) and assume that the issue had been resolved.

Now, crews deploy the camera after cleaning to see how well the nozzle cleaned the line. "Before we combined inspecting and cleaning, we were never really sure of our results," says Feeney. "Sometimes we would be back at the same spot in less than a year, but we never really understood what the problem was. We would just react to it. Now we can be proactive."

In addition to post-cleaning inspection, crews use the camera to monitor the actual cleaning process. By having the camera visually track the jetting process in real



John Hannon (left), inspection operator, and Mat Solitro set up the QuickView camera for an inspection.



Mat Solitro controls the city's ROVER camera/crawler from an inspection van. Images are captured and archived, then later copied to DVD for engineering review.

time, crew members can adjust water pressure and change the nozzle and method of cleaning on the spot, eliminate guesswork and ensure effective cleaning.

Making a difference

As a small agency, WSA faced budget constraints in developing its CMOM program. The authority could afford only one inspection operator, so it was critical to select a televising unit that would be easy to use, maneuver and operate.

After carefully evaluating choices, the authority purchased a 2007 Dodge Sprinter van from J.F. McDermott Corp., equipped with a ROVER robotic crawler camera system for mainline inspection, a

QuickView zoom camera for manhole assessment, and a Verisight Push camera for lateral lines, all from Envirosight LLC. The rig also includes an onboard computer and pipe survey data collection software from WinCan America Inc. WSA acquired the equipment over two budget cycles.

Inspection operator John Hannon has achieved what his superiors call remarkable production in the nine months since the authority began its scheduled inspection program, surveying and documenting 1,000 to 1,500 feet per day with no assistance. The goal is to inspect all lines installed before 1981 within 10 years.

The authority gave those lines

priority because after 1981, the WSA began using only PVC pipe, which has proven less prone to trouble than older lines made of VCP, ACP, cast iron, ductile iron and concrete. Most lines Hannon inspects are 8-inch mains that are not cleaned before inspection, making his productivity that much more noteworthy.

WSA is already reaping the benefits of inspection, as one problem area illustrates. The Oakland Beach area of the city had experienced five to seven blockages per year that typically led to multiple insurance claims from property owners. Crews would clean the lines, but the blockages would return.

Hannon inspected the line and discovered a 2-by-4 wedged directly across the pipe with debris caught on it: The block of wood was creating a dam. Using a Warthog high-velocity cleaning nozzle manufactured by StoneAge Inc., he removed the blockage and restored normal flow.

“Now, because we have the camera, we can eliminate claims and other related expenses for the future,” Feeney says. “When we go to a hot spot now, we’re not working blind. We can quickly assess what the problem is and know it isn’t going to be a problem anymore because we’ll know what it is, determine a way to fix it, and be done with it.”

Gathering evidence

Although going through the EPA checklist provided a good foundation, the mandate also required the authority to correct any deficiencies discovered during its assessment and to set repair and maintenance priorities for keeping the collection system infrastructure healthy and preventing potential future sanitary sewer overflows. That meant compiling scattered asset information into an easy-to-access repository.

WSA now collects all of its pipeline and manhole inspection data in an electronic format that will be linked to its GIS database in the near future. Using ArcView by ESRI, the GIS database includes scanned asset location cards, as-built drawings and maps of all of the system’s assets.

“With this information, we are able to click on a pipe and know its



Mat Solitro (left) and John Hannon deploy the crawler to televise a line.



A single operator can deploy the camera and crawler into manholes.

“Whether it takes five years or 10 years or longer, that’s all right. Look inside, define your system, and know what you have. That will help you create a solid plan of action for moving forward and creating a strong, healthy infrastructure for future generations.”

Mathew Solitro

material and the year it was built, and hyperlink back to any related maintenance history documents,” Solitro says. “Our field inspectors have laptop computers in their vehicles with full wireless access to this database. That makes us more efficient in responding to emergencies and in having information on the topography and history of the assets at our fingertips.”

Having the information centrally compiled provides a unique visual perspective when Solitro and Feeney assess potential causes of trouble. GIS mapping displays patterns, making culprits more visible.

“We had one neighborhood that displayed 14 blockages within a short time, indicating an area that needed our focus,” Feeney says. “The map details revealed that during inspection, almost every joint in the lines of this area had root intrusion. Until we were able to see our problems in this visual format, the cause didn’t always jump out at us. Now we can trace patterns using the map and track issues back to their source and remedy them.”

The staff has also discovered areas of inflow and infiltration through inspection. Eliminating I&I is a key element of the CMOM pro-

gram. Every gallon of clear water removed saves money in treatment costs, energy for pump station conveyance, and reserve capacity.

To help offset the costs of I&I mitigation, WSA established a special I&I fund by which all new connections are assessed a fee based on anticipated flow. The flow is calculated with a formula that accounts for occupancy, square footage, usage, number of bathrooms, and food preparation facilities. The fees are placed in a dedicated account to be used to remove two gallons of I&I for every gallon the property puts into the system. To date, WSA has billed \$135,000 in fees to help in fast-tracking system repairs.

Under the microscope

Solitro compares the CMOM program and self-assessment to being under a microscope. “The biggest benefit of this mandate and experience was having to ask ourselves some very difficult questions and having things that were always in the back of our minds suddenly brought to the forefront,” he says. “Everything was brought together cohesively in one document, and we could readily see our deficiencies as well as

where we were strong.”

For agencies looking to create a CMOM program and stay ahead of the regulatory curve, or for those currently under a mandate, Solitro advises: “Don’t get discouraged. Just keep pushing forward. It has to get done. It will get done, and when it gets done, you’re done.”

“Whether it takes five years or 10 years or longer, that’s all right,” Solitro says. “Look inside, define your system, and know what you have. That will help you create a solid plan of action for moving forward and creating a strong, healthy infrastructure for future generations.” ♦

MORE INFO:

- 66** **Envirosight LLC**
973/252-6700
www.envirosight.com
- 383** **J.F. McDermott Corp.**
866/323-3777
www.jfmcdermott.com
- 11** **StoneAge Inc.**
970/259-2869
www.stoneagetools.com
- 5** **Vactor Manufacturing**
815/672-3171
www.vactor.com
- 96** **WinCan America Inc.**
505/341-0109
www.wincanamerica.com