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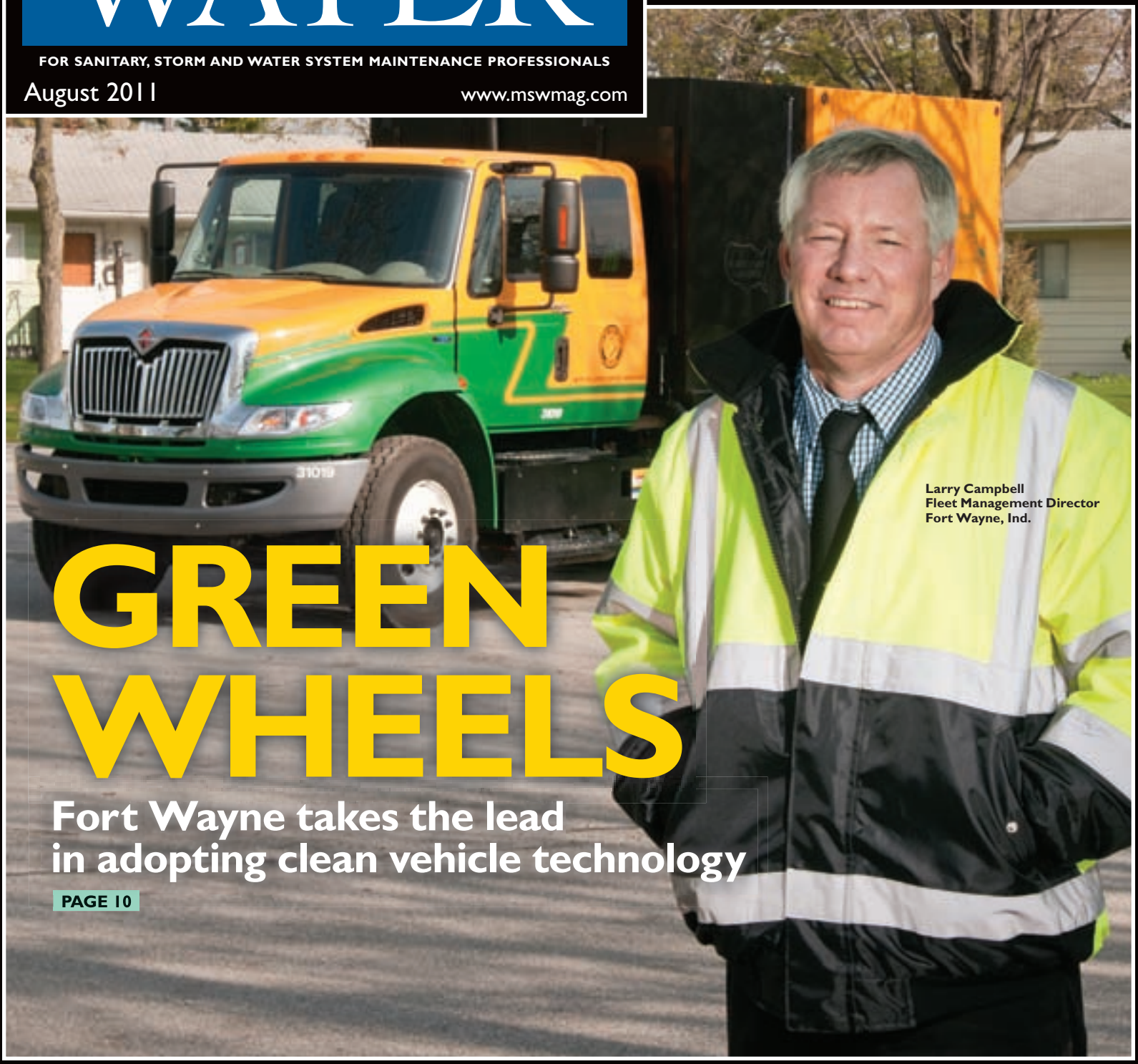

GREEN WHEELS

Fort Wayne takes the lead in adopting clean vehicle technology

PAGE 10

Larry Campbell
Fleet Management Director
Fort Wayne, Ind.

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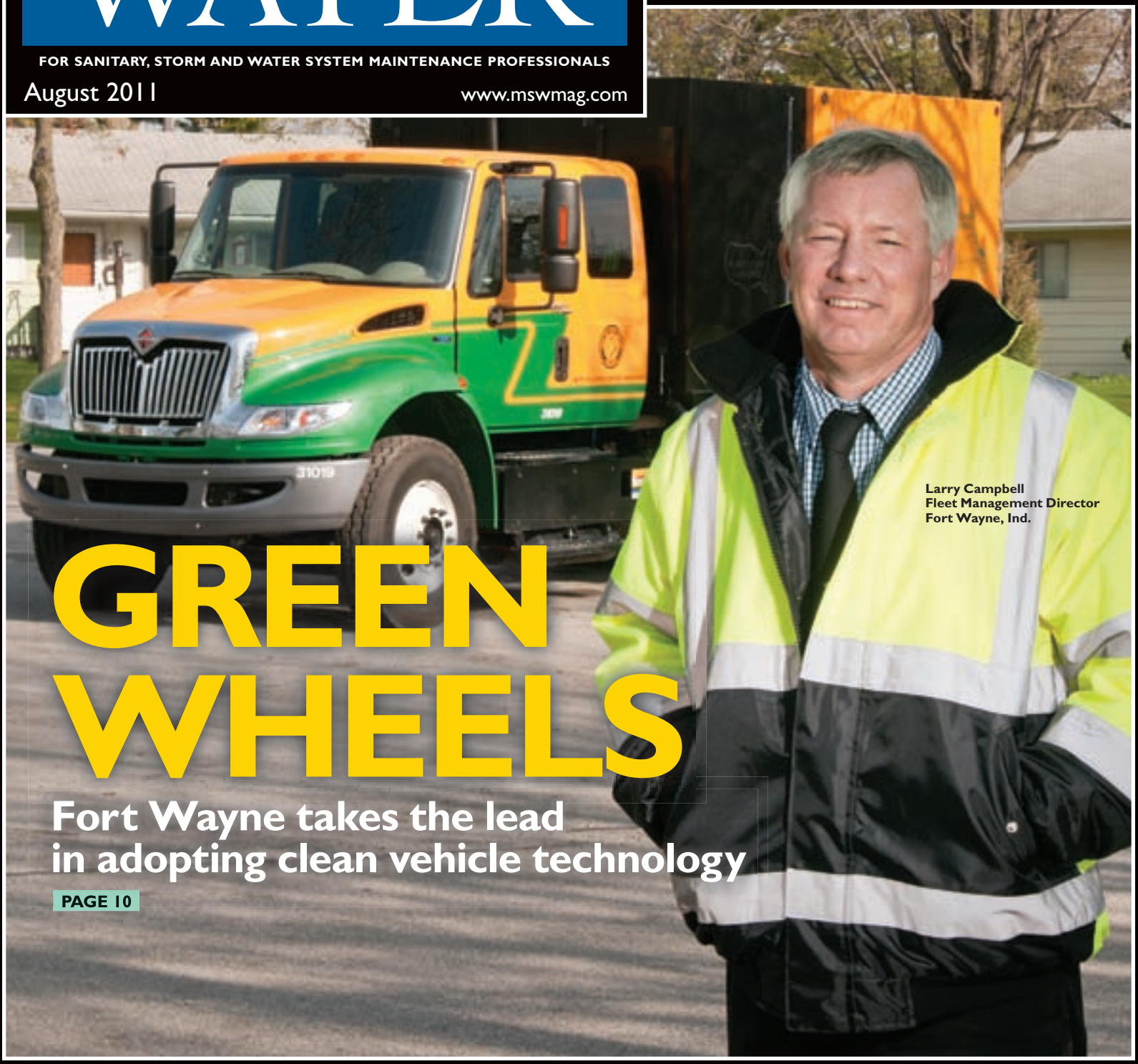

GREEN WHEELS

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Larry Campbell
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CHEMICAL AND MECHANICAL ROOT CONTROL

COVER:
Officials in Fort Wayne, Ind., believe in going green — that making services and infrastructure eco-friendly saves energy, creates jobs and positions the city for growth. Fleet management director Larry Campbell is shown with a hybrid jetter truck made by Sewer Equipment Co. of America. (Photography by Karrine Williams)

FEATURES

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HOW LONG CAN IT CONTINUE?

The country's fixation on budget austerity is chipping away at proven necessities. What will be the long-term effect of cutting water and wastewater investments?

FROM THE EDITOR

Ted J. Rulseh

I got my first full-time newspaper job when I was 23, and it paid next to nothing. In fact, if I broke it down by the hour, I made less than in the stopgap post-college job I'd held previously, setting up banquet tables in a hotel.

My car was a beat-up 1964 Rambler. The rear tires were getting bald, but I "couldn't afford" new ones. That is, until the day I was driving to the county seat on a state highway in heavy rain, and those tires hydroplaned.

In a flash, water spray obscured the windshield, and I was in a spin, my clipboard flying across the car. I braced for a crash with an oncoming truck or for a rollover in the ditch. Instead, the rear end thumped into a soft embankment and the car swung around and stopped, on the highway shoulder, facing in the wrong direction.

I was unhurt, and I just turned around and drove away. But I might have been killed and could have taken another driver with me. Guess what I bought that very day, before driving home from the county seat? Right — two new rear tires.

What we can afford

What has that to do with water and wastewater? Actually, a lot. The lesson is that it's extremely risky to forestall spending money on necessities. In these times when the word "austerity" is in vogue, we hear a lot about things our nation can "no longer afford."

Those things apparently include sound water and wastewater infrastructure. As I write this, Congress has just approved a 2011 budget that includes billions of dollars in spending reductions — and cuts almost $1 billion from EPA state revolving funds (SRFs) for water and wastewater. This at a time when the EPA estimates we need to spend $630 billion on water and wastewater infrastructure over the next 20 years.

Let's leave aside all the politics of taxation and spending and look at the stark reality. Infrastructure has to be maintained. If we neglect it, it is not going to improve with age, no more than my Rambler's tires were going to grow new tread if I waited.

Postponing maintenance almost always ends up costing more. We all know this, in many cases from personal experience. One more year with the aging shingles can mean a water-soaked ceiling and a big puddle on the living room carpet. A neglected fall furnace inspection can mean loss of heat on a subzero night and a very expensive emergency service call. And so it goes.

When it comes to water and wastewater infrastructure, the simple truth is: We built it, we have to maintain it. The word "afford" should not even be in the conversation. The "afford" should be, must be, built right into the water rates, sewer rates, and taxes we pay — end of discussion.

In the street

What does neglected maintenance of water and sewer pipes mean? Higher costs to handle I&I water at the treament plant. Sanitary sewer overflows. Backups into people's basements. Drinking water leaking from pipes into the ground. Main breaks and sinkholes. Compromised water purity.

And after that, and all it entails, you have to go in and fix the pipes anyway, at more cost than if you had simply kept them up. We all know this, and our elected officials should, too.

So, what is this "can't afford" mentality getting us? A sign on the wall at my first newspaper workplace said: "If you can't find time to do it right, how will you find time to do it over?" A corrollary for these times might be: "If we can't afford to maintain it, how will we afford to fix it when it breaks?"

It's a supreme irony: There is a very good chance this $1 billion cut in water-related funding — sold to the public as savings — may actually represent a bill for all sorts of problems. Except the public will never see it, unless it turns into a sinkhole that eats half of someone's downtown (and even then, no one will make the connection).

Sick and tired

When it comes to water and wastewater infrastructure, the simple truth is: We built it, we have to maintain it. The word "afford" should not even be in the conversation. The "afford" should be, must be, built right into the water rates, sewer rates, and taxes we pay — end of discussion. The alternative is to endure service disruptions, environmental degradation, and greater expense.

And finally, on basic principle, as a participant in the water and wastewater industry, and as a plain old citizen, I am sick and bloody tired of politicians telling me what this generally incredible and extremely wealthy country "can't afford." ✦

Comments on this column or about any article in this publication may be directed to editor Ted J. Rulseh, 877/953-3301; editor@mswmag.com.

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GREEN WHEELS

Fort Wayne takes the lead in clean-vehicle technology in everything from service cars and pickups to an advanced truck-mounted jetter

Flusher operator Jennifer Thurber, left, and flusher assistant Eric Exner use the city's 800-HPR hybrid jetter truck with the ECO Jet system from Sewer Equipment Co. of America. (Photography by Karrine Williams)

By Ken Wysocky

In Fort Wayne, Ind., city officials believe going green is an economic imperative — that making services and infrastructure eco-friendly saves energy, creates jobs and positions the city for growth. And with 1,700 vehicles under its control, the city's fleet management department is an impact player.

In the past six years, the department, ranked as one of the greenest in the country by Green Fleet and Government Fleet magazines, has bought dozens of hybrid vehicles, adopted biodiesel fuels, and installed idle-reduction systems on nearly 100 trucks. The hybrids include a prototype Model 800-HPR Series 3 sewer jetter truck with an ECO Jet System, made by the Sewer Equipment Co. of America.

The new technologies save an estimated 300,000 gallons of fuel per year and are helping the department toward its goal of reducing overall fleet emissions by 50 percent by 2015, says Larry Campbell, fleet management director.

"It's exciting to be on the cutting edge," he says. "Mayor Tom Henry signed an executive order in 2007 that mandated a 1 percent reduction in fuel use fleet-wide by the end of that year, and another 5 percent by 2008. We met those targets.

(continued)


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"I can't say we completely met the other goal, which is a 3 percent reduction every following year, because the reductions have leveled out. We can't just go out and replace the entire fleet with hybrids. We have to fit them into a replacement cycle and make sure they fit the application for which they'll be used."

Front and center

The Model 800-HPR truck jetter is the department's newest green addition. For now the only vehicle of its kind, the $200,000 truck rides on an International 4300 chassis with an Eaton hybrid-drive system, a 260 hp diesel engine, a telescoping hose reel that rotates 190 degrees, a 1,500-gallon water tank, and 2,000 psi/60 gpm water system.

"This is a concept vehicle, and our data will determine if they put the truck into mass development," Campbell says. The drive system captures braking energy, converts it to electricity, and feeds it to batteries. The battery power assists the engine during driving and minimizes the need to idle while the truck is working.

"You push the PTO button and it turns on the jetter system," Campbell explains. "Then the engine shuts down and the truck runs on the batteries. If the batteries run low, the motor kicks back on automatically and charges the batteries in about five minutes, then shuts down again. Any savings come from not idling while crews set up for jobs and from driving, not when we operate the jetter."

The Fort Wayne crew that operates the hybrid jetter truck includes, from left, flusher operator Jennifer Thurber, flusher assistant Eric Exner, fleet management director Larry Campbell, water pollution control maintenance supervisor Robert Heredia, and assistant Karen Morris.

Innovative approach

Representatives from Eaton, Navistar and Sewer Equipment collaborated to design the truck, which uses non-toxic hydraulic fluid and operates at 33 percent lower engine speed, reducing fuel costs and noise.

"I kept seeing hybrid aerial trucks at trade shows and wondered why we couldn't do the same thing with a jetting truck," Campbell says. "The initial roadblock was inadequate horsepower. The hybrid system alone only delivers

PROFILE:
City of Fort Wayne, Ind., Utilities Department

CHARTERED:
1840

AREA SERVED:
92 square miles

POPULATION:
254,000

CUSTOMERS:
85,000 sewer; 76,765 water

INFRASTRUCTURE:
1,159 miles of water lines; 2,022 miles of sanitary sewers; 526 miles of storm sewers

ANNUAL BUDGET:
$54.4 million

EMPLOYEES:
348

WEBSITE:
www.cityoffortwayne.org

DRIVING SMART

Better fuel economy from hybrid vehicles can vanish like vapors if they're driven improperly. To maintain the economy edge, Fort Wayne employees who drive hybrid Escapes, Ford Fusions and other vehicles get special training, says Larry Campbell, fleet management director.

One of the biggest issues is getting drivers to understand that more speed and jackrabbit starts decrease mileage. "The biggest learning curve revolves around the fact that you can't accelerate quickly with an electric-assist hybrid system and get the mileage you should," Campbell says. "So drivers have to understand that they're not going to be the first one to the next stop-and-go light. That's not the objective anymore."

To enforce good habits, employees watch a training DVD provided by the Ford Motor Co., then ride with Campbell, who shows them ways to optimize gas mileage. Then the employee moves to the driver's seat and Campbell explains what the hybrid system is doing as they drive.

In addition, the department monitors each vehicle's mileage. If something looks out of whack, someone in the fleet department calls the driver or his or her manager to address the issue. Some basic fuel-saving tips include:

- Making sure the hybrid system is engaged.
- Using the defrost as sparingly as possible because on some older hybrid models, it's powered by the gasoline engine.
- Using cruise control to avoid exceeding the speed at which the hybrid system shuts down and the gasoline engine takes over (that's 35 mph for the Escapes and 42 mph for the Fusions).

"The instinct is to follow the car in front of you when accelerating and decelerating," Campbell says. "We advise them to use the cruise control to maintain a steady speed."

(continued)

PHOTO COURTESY OF LAURA WALTENBURG

The City of Fort Wayne's green fleet includes hybrid Ford Escape SUVs, GMC partial-hybrid pickup trucks, the hybrid jetter truck, and other fuel-efficient vehicles.

PHOTO COURTESY OF LAURA WALTENBURG

Larry Campbell, fleet management director.

18 hp, and we need more than that for most jobs."

To compensate, the truck's engine kicks in to power the jetter when crews require full cleaning power. The truck hasn't been in the field long enough to measure fuel or emission savings, although the specifications say it should use 30 percent less fuel in the hybrid mode.

"Our goal is to save 900 gallons of diesel fuel a year compared to the same non-hybrid unit, or 60 percent," Campbell says. "Even with diesel fuel at $3.50 a gallon, that saves about $3,150 a year. We have three other trucks identical to this one that aren't hybrid, so it'll be easy to benchmark for comparisons."

Grants defray costs

The city paid part of the truck's cost with a $50,000 federal grant through the Greater Indiana Clean Cities Coalition, a state chapter of the national Clean Cities program, sponsored by the U.S. Department of Energy. That covered the $50,000 premium for a hybrid truck.

The 800-HPR truck jetter with the ECO Jet system from Sewer Equipment Co. of America uses hybrid technology to save energy, even during setup for cleaning jobs.

"It's exciting to be on the cutting edge. Mayor Tom Henry signed an executive order in 2007 that mandated a 1 percent reduction in fuel use fleet-wide by the end of that year, and another 5 percent deduction by 2008. We met those targets."

Larry Campbell

In fact, grants have been instrumental in paying for other hybrids. They accelerate savings by almost eliminating any payback period. The city won a $40,000 Clean Cities grant that covered the higher cost of a 2009 International 4300 hybrid dump truck with a 225 hp diesel engine and 5-ton dump body.

"We've been very fortunate to get grants to help pay for hybrid technology," Campbell says. "Without those two grants, we wouldn't have been able to afford the hybrid dump truck and jetter truck. All bigger cities are applying for grants, and I would highly recommend applying for them.

"As you can imagine, it's very competitive. Only two cities in Indiana received any grant money in the last round. A lot depends on how well the grant request is written. It helped that the jetter truck is the first of its kind, as they're always looking to advance and promote the newest technology."

The dump truck achieved a 17 percent fuel savings during its first year, but now savings are closer to 10 percent because it's used for a different purpose Campbell says.

Cars and pickups

As part of its initiative, the department has purchased 38 hybrid cars, SUVs and pickup trucks in the past six years. For use by inspectors, managers and engineers in the Water, Water Pollution, Street, Engineering and Traffic Engineering departments, the city has bought 26 hybrid Ford Escape SUVs since 2006. They average about 28 mpg in summer and 26 mpg in winter, versus about 8 mpg for the vehicles they replaced, which were mostly Chevrolet S-10 pickups and other full-size pickups. "They idled a lot," Campbell says, and that drastically cuts fuel economy.

After fleet volume discounts and federal tax breaks available at the time of purchase, the hybrids cost about $5,000 more than conventional Escapes. Campbell estimates it takes three years to recoup the difference through fuel savings. "Each of those vehicles saves us an average of 680 gallons of gas per year, which comes out to about 17,680 gallons, for a rough savings of $52,300 a year," he says.

One pleasant surprise: Maintenance costs, especially for batteries, have been much lower than expected. "Everyone looks at it and tells you the maintenance costs will be higher, but they've been very good for us," Campbell says. "We have not experienced any battery replacements, so their life cycles have been very good. In fact, I've recommended them to other organizations throughout Indiana."

Suitable applications

The department also runs five 2010 Ford Fusion hybrids with about a $5,000 price premium. "The pricing for Fusions was very good because Ford really wanted to get them out into fleets," Campbell says. "We're averaging 35 mpg, compared to about 12 mpg for the Ford Crown Victoria and Taurus vehicles they replaced. Much of the improved fuel economy has to do with driving habits.

"We don't have any firm numbers yet on how much money the Fusions have saved us, but with the previous cars getting 12 mpg, we know we're getting significant savings with the Fusions, which are driven an average of about 10,000 miles a year."

The department also bought seven 2005 and 2006 GMC partial-hybrid pickup trucks, used by water and street crews. They haven't been as fuel efficient as expected.

In considering hybrids, Campbell says it's critical to match the vehicle to the application — not just buy a hybrid for its own sake. For example, Escapes were a good fit to replace pickup trucks for parking control employees, but not to replace engineers' pickups, which carry road cores in the truck beds.

"If you carry those samples in the back of an SUV, they can fly forward during a sudden stop and pose a danger to the driver," Campbell says. "We scrutinize every vehicle in many ways because utilization is very important."

Cleaner, less idling

Another prong of the department's initiatives is reducing truck

"Initially, biodiesel improved our fuel economy only fractionally — about six-tenths of a mile per gallon. But it's still worth it because we know the emissions are cleaner, and using it makes us less dependent on foreign oil."

Larry Campbell

idling. In 2006, the department instituted an idle-reduction program that relies on computer programs to shut off dump truck engines if they idle for more than 10 minutes. "We installed the computers mainly on 105 large diesel dump trucks, but we had to take some off, so now it's closer to 80 in all," Campbell says.

In the program's first full year (2007), it saved 24,000 gallons of diesel fuel, which then cost about $2.55 a gallon, for $61,000 in savings. In 2008, the fuel cost about $3.07, and the department saved $74,000.

In addition, the department's 298 diesel-powered vehicles use B20, a biodiesel fuel with 20 percent soybean oil and 80 percent diesel. The savings have not been significant because B20 has not cost substantially less. In fact, when diesel prices dropped last year, B20 cost up to 10 cents per gallon more.

"But part of that had to do with a federal blending credit of $1 per gallon that expired," Campbell says. "Initially, biodiesel improved our fuel economy only fractionally — about six-tenths of a mile per gallon. But it's still worth it because we know the emissions are cleaner, and using it makes us less dependent on foreign oil."

Look ahead

Campbell says the department will continue its green initiatives, which could include electric vehicles if the application is suitable. "If they're driven less than 80 miles a day, then they might make sense," he says.

On the other hand, he expects technology to keep improving, so the dynamics of evaluating hybrid vehicles may shift. "What do I see in five years? I think we still want to be a developer of hybrids and plug-ins," he says. "I think converting our entire fleet to hybrids is a pipe dream, especially with police cars, fire trucks and heavy equipment. The cost is way too high.

"But battery technology keeps getting better and better, so who knows? When I was a kid watching the Jetsons fly around, their world seemed far away. But how close are we now to being the Jetsons? Maybe not that far." ✦

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BACK FROM THE BRINK

When customers began facing water shortages, Cohasset launched a 15-year, $33 million project to upgrade a water treatment and distribution system that had been allowed to deteriorate for years.

PHOTO COURTESY OF COUGHLIN ENVIRONMENTAL SERVICES

When customers ran out of water, Cohasset, Mass., got serious about improving its system. Today, it's an award-winner.

By Jim Force

Benjamin Franklin once said, "When the well runs dry, you know the worth of water." The residents of Cohasset, Mass., couldn't agree more. The taps ran dry in part of this affluent South Shore Boston suburb of 7,000 people on Memorial Day weekend, 1994.

"One whole section of town simply ran out of water," says Glenn Pratt, former chairman of the Cohasset Board of Water Commissioners. "People turned on their faucets and there was nothing. It caused political upheaval, as you might imagine. This is New England, where we have open town meetings, and everyone has their say. A couple of our commissioners resigned."

The crisis also launched Cohasset on a 15-year, $33 million project to upgrade a water treatment and distribution system that had been allowed to deteriorate for years. Today, the system, operated under contract with American Water, is as good as they get. Though water rates are the highest in the state, residents don't seem to mind. When they turn on the kitchen faucet, the garden hose, or the lawn irrigation system, they get plenty of good, clean water.

> **"People turned on their faucets and there was nothing. It caused political upheaval, as you might imagine. This is New England, where we have open town meetings, and everyone has their say. A couple of our commissioners resigned."**
>
> **Glenn Pratt**

Letting it slide

The Cohasset Water Department operates as an enterprise fund, owned by the town and governed by elected commissioners. The department supplies drinking water to 2,400 residents and to a neighboring retirement community. It also provides and maintains waterlines for firefighting. The system is funded entirely through water bill revenue, and rates are approved at the annual town meeting.

About 40 years ago, realizing that its water system would not be adequate for future needs, the town built a new water treatment plant at Lily Pond and created the Aaron River Reservoir to supply water for a population expected to grow to 20,000 in the decades ahead.

"When those projects were completed, community leaders assumed the problems had been resolved," says Pratt. Not so, of course. Increased demand for water, brought on by such luxuries as inground watering systems, started straining capacity in parts of the community. Sediment built up in the Bear Hill storage tank. Old lines deteriorated. Water leaks became common. At the same time, the department faced labor turmoil and annual budget deficits.

"From 1977 to 1994, not a nickel was spent on maintenance or improvements," Pratt recalls. "Little was done except an occasional repair when something broke."

PROFILE:
Town of Cohasset, Mass., Water Department

ESTABLISHED:
1950

POPULATION:
7,300

AREA SERVED:
9 square miles

INFRASTRUCTURE:
36 miles of water mains

ANNUAL BUDGET:
$4.4 million

EMPLOYEES:
6 (treatment plant operated by American Water)

WEBSITE:
www.cohassetwater.org

PHOTO COURTESY OF TUTELA ENGINEERING

The installation of water mains in Cohasset required construction techniques to address the presence of ledge, groundwater and, as shown, the crossing of tidal streams.

PHOTO COURTESY OF COUGHLIN ENVIRONMENTAL SERVICES

During main replacements, residents received water through bypass piping with locking groove joints and temporary service taps. The 200 psi class Certa-Lok Yelomine piping from CertainTeed allowed quick assembly, had good hydraulic characteristics, and required minimal piping restraint.

"Some of the lines consisted of cast-iron pipes that dated back to the 1800s. In some places, flow was down to 20 gallons a minute or less."

Tom Keeffe

IMPROVEMENTS AT LILY POND TREATMENT PLANT

Cohasset's Lily Pond treatment plant, opened in 1977, underwent major improvements as part of the town's program to improve water treatment and distribution. With engineering design furnished by Weston & Sampson Engineers, the improvement project involved:

- Rehabilitation of sludge lagoons
- Replacement of eight transmitters and two flowmeters
- Installation of variable-frequency drives on raw water and chemical feed pumps
- Replacement of filter media
- New rapid mix motors, drives, shafts and mixers
- Improvements to the intake structure
- A new motor control center, including SCADA
- Replacement of the generator automatic transfer switches
- A new residuals holding tank

These improvements totaled just over $2.7 million and gave the plant the ability to process up to 2.5 mgd. Current demand is about 0.5 mgd.

PHOTO COURTESY OF TUTELA ENGINEERING

Sample sections of Cohasset's 100-year-old unlined cast-iron water mains were removed and collected to assess their wall thickness and level of tuberculation.

Spurred to action

When the system failed on that holiday weekend, Cohasset got serious about its water supply. Over the next couple of years, the commission put together a comprehensive long-range plan and began to make the necessary improvements. Initially, the town focused on installing new water mains, repairing old mains in its 36-mile system, and adding reserve capacity to ensure adequate pressure and supply to fight fires.

By the end of the 1990s, the town had installed new water meters at each customer site, made improvements to the water supply filter beds to reduce sediment in the system, and launched an extensive program to clean and inspect all water mains. Operational squabbles came to an end when the town signed a plant operations contract with American Water (the agreement has just been renewed for another 10 years).

A second water storage tank, larger and taller than the old tank, was built on Scituate Hill, allowing the town to take the old Bear Hill tank down for repairs and cleaning. More than seven feet of sediment was removed from the tank bottom.

In recent years, fire hydrants have been repaired and repainted, and 100 more hydrants are now in service around the system. The old well field was rebuilt, and Cohasset began selling water to the neighboring retirement community of Linden Pond. A new 1.5-mile line provides an average of 325,000 gallons of potable water a day through a booster station that lifts the flow 20 feet and includes monitoring for pH, chlorine, fluoride, turbidity and color.

Cohasset has also taken steps to protect critical watershed areas, improve the Lily Pond treatment facility, and build rain gardens and other low-impact structures to control stormwater runoff. "It took 15 years of non-stop construction," says Pratt.

Fixing the mains

More than half the town's water mains were either repaired or replaced during the Cohasset project, according to Tom Keeffe of Tutela Engineering Associates of Wilmington, Mass., which had the major design responsibility for the distribution system. The department had installed several miles of new water main along a two-lane state highway in the 1950s — that was still in good shape.

Open-trench construction was

used for most of the new lines, while test pits at bends and valves about every 800 feet provided access for cleaning and lining of existing pipes. "Some of these lines consisted of cast-iron pipes that dated back to the 1800s," Keeffe says. In many cases, the C-factor (friction level) in the pipes had increased to the point where flow or pressure, or both, were inadequate. In fact, the town was in danger of losing its fire insurance rating. "In some places, flow was down to 20 gallons a minute or less," says Keeffe.

To restore or increase the capacity of the line, larger-diameter class 52 cement-lined ductile iron replacement pipe was either pulled through the existing excavations or laid right alongside the old lines to increase capacity. Existing excavations were used in a rocky section along the coastline, where opening new trenches would have been difficult if not impossible. Contractors Tom Gioioso Construction of Rockland and R. M. Pacella of Plainville headed the pipe replacement projects.

the full tenure of the project. The initial work provided a new two-mile loop to the section of the town that ran out of water back in 1994. Once service had been restored to those customers, contractors concentrated on the worst sections first, based on flow restriction and pipe ages.

"Priorities were based on benefits achieved," Keeffe says. "The town contracted for about $750,000 to $1 million dollars a year. We wanted local contractors to bid as opposed to one large contract. And in the Northeast, we are limited to the warmer seasons."

In the Little Harbor section of the community, installation of new water mains was coordinated with new sewer lines being installed by the town wastewater utility, saving on excavation and pavement resurfacing costs. In addition to the replacement and lining, contractors undertook spot repairs around the system where needed.

During construction, surface bypass lines were frequently used to supply water to affected customers. Pratt says that while these

A faulty and corroded hydrant, 6-inch valve and main tee were removed during replacement and upgrade work. Isolated repairs were incorporated into the repair contract to improve system reliability for both supply and fire protection.

PHOTO COURTESY OF COUGHLIN ENVIRONMENTAL SERVICES

IN THE TROPHY CASE

The Cohasset Water Department has received numerous awards resulting from its refurbished system. These include:

- 2003 – Rated in the top 10 percent of water systems in the state by the Department of Environmental Protection and the New England Water Works Association.
- 2006 – Smart Growth Award from the state Executive Office of Environmental Affairs for a rain garden project.
- 2006 – Recognized by the Centers for Disease Control and Prevention for exemplary fluoridation practices.
- 2008 – National PISCES Award from the EPA for the rain garden project.

Pipe lining

Depending on the length of the line, it sometimes proved cost-effective to salvage existing lines by cleaning and lining them. Bizko Contracting Corp. of Fall River pulled chain flails through the lines to clean the interior surfaces and then used sprayer assemblies that traveled through the pipes and lined them with concrete. CCTV units provided final inspection of the cleaning and lining.

The rehabilitation of the distribution system continued over

temporary lines maintained water service, the flow was free to customers and was not metered, so 60 to 90 days of usage data was lost.

Leaks and losses

Leaks presented other problems. The town reports that 417 individual system leaks were identified and fixed during the project, saving more than 75 million gallons of water and more than $100,000 a year. Using acoustical testing, the town located many of the leaks in old goosenecks or galvanized connections at service connections, which normally occur about every 100 feet throughout the system.

A technician hired by American Water continues acoustic testing of the system on a regular basis. In addition to the distribution lines, the Cohasset rehabilitation project reworked the old well field and added storage capacity to the system.

The Ellms Meadow well field dates to the 1880s when the community drew most of its supply from seven shallow wells. It was kept in operation to supplement flow from the reservoir during dry summer months. Keeffe's firm designed a plan to keep the well field active by replacing the old wells with five new wells, each driven to 25 feet, and by constructing a pumping station where chlorine and fluoride are added to the flow and measured using Hach instrumentation.

The new storage tank on Scituate Hill gives the town a total storage capacity of 1.8 million gallons. It is a welded steel vessel 75 feet in diameter and 58 feet tall. Internal Tideflex Technologies (Red Valve) duckbill diffusers completely mix the tank contents to keep the water fresh.

Keys to success

After so many projects over so many years, Cohasset could write the manual on how to rehabilitate an entire system. Pratt says careful division of responsibilities, and coordination across all tasks was extremely important. Also, Cohasset was able to secure funding

PHOTO COURTESY OF TUTELA ENGINEERING

Resident engineers maintained written field notes that located critical components of the distribution system, such as valves, fittings and couplings. Crews also used a Trimble handheld real-time GPS device to collect as-built information.

from a variety of sources to help pay the millions of dollars in bills.

Instead of lumping all projects into a single contract with one consulting firm, Cohasset divided the work among three companies. "This way, they were able to really focus on each phase of the project," explains Pratt.

Tutela Engineering Associates designed and planned the distribution system work. The improvements at the treatment plant were the responsibility of Weston & Sampson Engineers of Peabody, and Norfolk Ram Group of Plymouth developed the watershed protection plans.

The fact that all three firms were

working on the Cohasset project at the same time made coordination critical, and hiring a construction project manager was another key step. "Normally, the water system employs six people, but during the project, we staffed up to 12, including the construction manager, who was responsible for coordinating all phases of the project," says Pratt. "He served as a good traffic cop.

"We added an extra clerk position in the office, hired three more people to work on the distribution system, and added an extra operator at the plant because we were running more unscheduled shifts."

Financial help

Cohasset also looked for funding wherever it could. The town tapped into the Massachusetts state revolving loan fund for $21 million. The agreement to sell water to the Linden Pond development nearby was another revenue source. The town received additional money through a grant from the state Department of Environmental Protection and got funds from the Clean Water revolving loan fund to support the construction of 36 rain gardens. The balance of the money was raised through public bond issues and rate increases. Today, 62 percent of the water system's annual budget goes to debt retirement.

"It's the biggest public works construction project the town has ever undertaken," says Pratt. "Pretty aggressive for a small town." The board was just as aggressive on the public relations front, reporting progress regularly in the local news media. Bill stuffers alerted customers to pending projects and changes. A first-rate color brochure details the history of the project and the benefits to the community.

The board refused to sidestep customer complaints. "If we knocked down someone's fence, we just went ahead and paid for it," says Pratt. "It wasn't worth it to argue over claims."

Happy ending

Pratt, who runs a local building maintenance company and is finishing his twelfth year on the Water Board, sits back and expresses satisfaction with the progress his town has made.

"We finished all of the projected improvements, and we have a great system — one of the best in the state," he says. "We spent $33 million, but we're in terrific shape. Sixty percent of our distribution is less than 10 years old. We're producing excellent water. We've maxed out our scores on the insurance bureau ratings. It's a good place to be." ✦

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Robert Koczko, sewer maintenance foreman, uses infraMAP to document cleaning, inspection, maintenance, and repair work on the collection system. (Photos courtesy of Azteca Systems)

BETTER MOUSETRAPS

PRODUCT:
Cityworks CMMS

APPLICATION:
Computerized asset maintenance management system

BENEFITS:
GIS-centric asset management, issues and tracks work orders, manages labor

USER:
Cucamonga Valley Water District, Rancho Cucamonga, Calif.

SUPPLIER:
Azteca Systems, Inc.
801/523-27551
www.azteca.com

WEBSITE:
www.cityworks.com

FAREWELL TO PAPER

An electronic asset management system helps a California water district improve efficiency and accuracy in maintaining its sewer and water systems

By Scottie Dayton

"The key to installing such systems is to involve your field employees. If you want them to use the application and enter information correctly, they must have an active role in the selection process."

Darron Poulsen

The Cucamonga Valley Water District in Rancho Cucamonga, Calif., needed to improve on a location-based customer information program for work order management systems. Water crews had no way of knowing if leaks were on mains, service lines, or fire hydrants; sewer crews lost track of cleaning schedules, and the software also lacked costing features and analytic tools.

Darron Poulsen, customer service officer, had experience implementing work order management systems and led the search for a better system. "The key is to involve your field employees," he says. "If you want them to use the application and enter information correctly, they must have an active role in the selection process."

The critical factor was that the solution had to integrate with the district's GIS mapping software from Esri. The team chose infraMAP Field Crew software from iWater, Dig-Smart 3.1 software from Dig-Smart, and the Cityworks GIS-centric computerized maintenance management system (CMMS) from Azteca Systems.

While the infraMAP field mapping platform and Cityworks environment appear similar, field employees chose infraMAP because they found it easier to access their service requests and work orders. Doing so launches Cityworks.

"Cityworks is the seamless, centralized database for all the information we collect," says Poulsen.

Strategic vision

In 2008, the district hired Darrin Farmer, project manager from Weston Solutions in Roseville, Calif., to help manage system implementation and organizational change.

"Making them comfortable with the application was critical," says Poulsen. "Darrin held regular training sessions. He could communi-

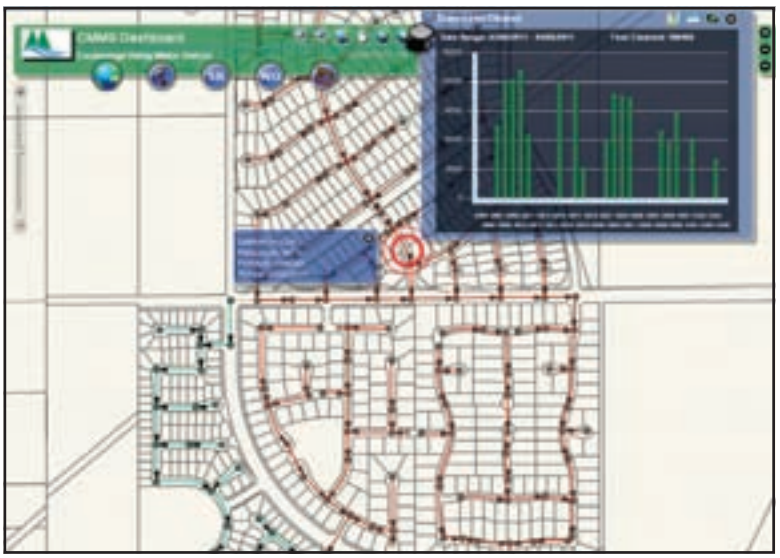
cate from the field employee's perspective, then talk database management with IT and GIS teams."

Weston also designed a database for the production department to manage wells, pumps and motors, and configured infraMAP to support workflows. The district rolled out the program in small increments, targeting crews that caught on quickly, including a sewer cleaning team under sewer maintenance foreman Robert Koczko and a crew under water maintenance foreman Patrick Milroy.

"Those people became champions of the application and helped more field personnel become comfortable with it," says George Rodriguez, water and sewer maintenance superintendent. "All of a sudden, paperwork orders began going away and we had some immediate successes."

The sewer cleaning program is on a one-year cycle. When Koczko joined the district in 2003, he tore a street atlas into four sections to cover the 413 miles of sanitary sewers, two lift stations, and 7,700 manholes in the 52-square-mile service area.

The operations dashboard enables managers at the Cucamonga Valley Water District to quickly and easily see the sewer lines that were cleaned in a specific period.



"I called the sections coloring books because that is how we did 100 percent of our documentation," he says. "When George wanted the history on an asset, I'd dig through stacks of paper in a file cabinet to find it. Now everything is available with the click of a mouse."

Since it deployed Cityworks in 2008, the district has consistently achieved its one-year cleaning goal and has not had an overflow in a sewer main. "The sewer department is very proud of that accomplishment, and the documentation is in the computer to prove it," says Koczko. The Cityworks application also helps users enter information into reports.

Accurate representation

The water department uses infraMAP to maintain its 700-mile distribution system and 22,474 valves. "The crew identifies the valves to be exercised on infraMAP and records the number of turns," says Rodriguez. "After completing work in an area, they create an electronic work order and all the information is retained through Cityworks."

Water and sewer crews also use infraMAP to correct as-built plans in the field. "Instead of noting the error on a piece of paper and hoping somebody will make the correction at a later date, they use the redline tool to indicate the change in infraMAP," says Rodriguez. Cityworks then forwards the information to the engineering department for a prompt update.

While the district has mapped 99 percent of its assets, some remain unmapped or are mapped incorrectly. When field crews find them, they flag them via the redline tool for the GIS team to review and correct. The asset maintenance history Cityworks creates will enable the district to identify and monitor problems and make informed decisions on whether to repair or replace pipes that have exceeded their life expectancy.

Patrick Milroy, water distribution foreman, creates and displays work orders and service requests within the infraMAP interface, which connects directly to the Cityworks computerized maintenance management system.

The district measures accountability in terms of efficiency rather than dollars. "It's about communication across departments and the fact that nobody loses information anymore," says Poulsen. "We also don't duplicate work because Weston helped us develop an electronic operations dashboard that allows personnel throughout the district to access real-time information and communicate the work being done in the field. It's a real time- and labor-saver in every respect."

Service alerts

Another timesaver, Dig-Smart, enables workers to take electronic, mapped underground service alert tickets into the field, insert notes and comments, attach photos, and post the contents to the database.

"When an alert arrives, it creates a work order in Cityworks that is completed using Dig-Smart," says Poulsen. "The application runs on three field employees' laptops, and supervisors access the Dig-Smart management tool from their desktop. They can review the history of when it was done, who did it, and wwcreate reports. It's all at their fingertips instead of sitting in a file cabinet."

To further improve customer service, the district is considering a Web-based interface for residents to request services and report problems. The tool would include the ability to report problems by uploading images of them from smartphones.

"We're also working on integrating alarms and equipment run times in the field from SCADA to create work orders and drive our production and treatment departments' maintenance programs," says Poulsen. "As our strategic vision continues to grow, Cityworks and infraMAP provide the tools to help us realize our objectives." ✦

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Crew members Joe Abila, right, and Jesus Cervantes work on an 8-inch sewer line that needed cleaning and treatment with Vaporooter root control. (Photography by Bryan Oller)

FOCUS: SEWER

A FRESH PERSPECTIVE

By taking an out-of-the-box approach to pipe cleaning and root control, a Rocky Mountain utility saves money, protects its critical infrastructure, and conserves energy

By Suzan Marie Chin

New to wastewater but not to infrastructure, Dan Fields saw a unique opportunity when he joined Colorado Springs Utilities in 2009.

He sought to improve operations by looking at routine maintenance tasks and methods with a fresh pair of eyes and a new perspective. The results include new methods and practices for cleaning, root control, maintenance scheduling and inspection that are delivering significant and consistent reduction of sanitary sewer overflows (SSOs).

Fields, superintendent of Wastewater Collections and Maintenance, knew he had his work cut out when he transferred to the department after a long and successful career on the potable water side.

Availing himself of multiple information resources, he was a quick study and soon saw a number of areas where a different approach could help the department achieve its cleaning and maintenance objectives in less time and at less cost.

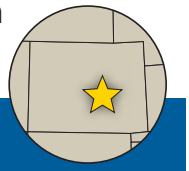
Knowing where you stand

During his daily commute, he noticed something he could apply to the way the department dealt with pipe cleaning. "When you leave your home, wherever you live, by the time you get to work, you know that stretch of road," he says. "You know what stretch needs to get repaved, where there's a pothole that you need to avoid, and what sections could go a couple more years before needing to be repaved.

"You see it, and it's logged into your mind. So I thought that same analogy could work in our sewer system. It was an 'Aha!' moment. Everything we do should hinge upon visual, concrete knowledge of the system, not on making assumptions or just cleaning because we think we need to clean it."

The Colorado Springs collection system includes more than 1,600 miles of gravity-based sewer with 19 lift stations. It is broken down into basins and sub-basins. Cleaning was typically scheduled on a rotating basis: Crews worked in a particular basin, cleaning it from top to bottom, using a variety of methods and tools.

The utility has six CCTV inspection vans equipped with Pathfinder cameras and Badger wheeled transporters (Aries Industries) for



PROFILE:
Colorado Springs (Colo.) Utilities, Wastewater Collections and Maintenance Group

EMPLOYEES:
65

INFRASTRUCTURE:
1,640 miles of gravity sewers, 19 lift stations

POPULATION SERVED:
380,000

AREA SERVED:
186 square miles

Annual budget:
$1.5 million (operations and maintenance)

WEBSITE:
www.csu.org

Jesus Cervantes puts away a water hose after a cleaning job.

"Your biggest expenses for your fleet are fuel and water usage. By cutting the cleaning workload by more than half — do the math. That adds up to a significant savings."

Dan Fields

assessment of the system. Fields approached management and his teams with the idea of reassigning two of the CCTV vans and crews to inspect pipes before cleaning and to be the "eyes in the pipe."

These inspection vans formed the basis for a new Basin Recon program. Instead of cleaning the basin completely just from past practice, crews would first inspect each line to determine its cleaning needs.

Recon inspections differ from typical assessments, which require inspection at a specific pace using NASSCO Pipeline Assessment and Certification Program (PACP) defect coding. A Basin Recon assessment is a quick visual pass to determine what cleaning method or tools each segment of line will need — if it needs cleaning at all.

One basin, which contained 4,000 feet scheduled for routine cleaning, was put into the Recon program as a test. Inspections showed that only 1,800 feet actually needed cleaning. "Your biggest expenses for your fleet are fuel and water usage," says Fields. "By cutting the cleaning workload by more than half — do the math. That adds up to a significant savings."

The annual cost savings are significant, but the real benefit is the time crews save by going through the basins faster, again reducing the chances of future SSOs, notes Fields. Based on the findings of the test inspections, all basins are now reconnaissance-inspected before maintenance cleaning.

Brains vs. brawn

The department now applies the same look-first approach to emergency response cleaning when applicable. In the past, when crews suspected blockages were caused by the typical culprits of root intrusion or FOG, they deployed heavy-duty cleaning methods.

Case in point: The piping in Colorado Springs is 68 years old on average, half of it vitrified clay pipe (VCP). During a standard CCTV inspection survey in 2007, crews noted a fracture on one segment that was scheduled to be cleaned.

In 2008, when reinspected, that same section showed portions of pipe missing, and no one had accessed the pipe but utility cleaning crews. "One of the benefits of using our CCTV inspection data was learning that in some cases we were our own worst enemy," says Fields. "In a case like this, we were using overly aggressive methods on a fairly fragile part of the system that, if handled differently, would have remained in serviceable condition for a long time.

"We were defeating the purpose of cleaning, using sheer force and creating damage to our system. It was kind of like using a

Colorado Springs wastewater collections superintendent Dan Fields.

CLEAR PATH TO THE PLANT

Fats, oils and grease are a problem every metropolitan collection system faces. Colorado Springs Utilities wastewater collections and maintenance superintendent Dan Fields is now using an easier solution than the old, tried-and-true jetting and mechanical tool method for ridding his aging and fragile system of FOG.

Fields and his team had seen great success from adding chemical root control to their maintenance toolbox. So when they saw a demonstration at a trade show of an additional product from Vaporooter that could combat FOG less intrusively and with less risk of pipe damage, they decided to give it a try.

The Grease Release product has a chemical makeup that Fields and his team found intriguing. It breaks down the grease and removes it from the pipe walls and also keeps it from coagulating again. Now, when cleaning crews are deployed, the utility's Vactor 2100 Series combination trucks and its four 800-HPR Series 3 jet trucks from Sewer Equipment Co. of America carry the product. The crews use it routinely in any area with a history of FOG problems, and in high-density areas with restaurants or ethnic populations that use oils heavily for cooking.

Armed with this soft-grease-removal tool, cleaning crews do not have to resort to high-pressure cleaning nozzles or heavy mechanical tools, which can stress fragile older pipes.

"Some of the other products or traditional jetting methods we had been using were cleaning the grease and ridding the line of the blockage, but it was just pushing the problem further down the line," Fields says. "Now we have a solution that doesn't delay FOG issues to another time or place. It takes care of it completely right at the source."

The Colorado Springs Utilities team includes, front row, from left, supervisor Nick Verdi, Tom Leyba, Cassie Davis, Jesus Cervantes, Adam Sanchez, Gene Engle, Jimmy Gallegos and Jeff Spencer; second row, supervisor Carlos Wright, Steve Pickens, Bobby Hayslett, Andrew Johnson, Joe Abila, David Clegg, Chris Jones, J.R. Palacio and Scott Gardner; back row, Gary L. Smith, Steve Van Tine, Gary A. Smith, Bert Meehan, Frank Trujillo, Tad Schlosser, Rob Paraggio, Juan Nieves, Chris Whitten, Jim Frick, Mike Smith, Al Atencio, Bobby Westman, Brian Ullom and Romel Gilmore.

A crew member prepares to perform a CCTV inspection with an Aries camera outfit in a system using Pipeline Assessment and Certification Program defect coding from NASSCO.

12-gauge shotgun to eliminate a pesky fly on the wall. You get rid of the fly, but now you have an expensive repair job to put your wall back in place.

"Now, instead of instantly reaching for the tough mechanical tools, we see the condition of our line segments first. That gives us the opportunity to stop, think and select the right mechanical tool or method that will do the job but create no harm."

A softer touch

Root intrusion is of great concern to Colorado Springs. The region has a heavy indigenous tree population, and root intrusion was a major source of SSOs throughout the system. Basin Recon inspections revealed that mechanical tools, although effective and appropriate in many cases, could often do unnecessary damage. Therefore, Fields began investigating a softer approach.

His team's research led him to consider chemical root control as an alternative to mechanical cutting, which was actually helping to exacerbate root growth. The more the crews mechanically cut the roots, the stronger they grew back.

Colorado Springs had used root-control contractors over the years, but Fields was looking for a way to bring the work in-house. The majority of contractors and suppliers told Fields this work was "better left to professionals."

Fields disagreed, believing his crews were smart and capable enough to be trained and do the job. He found his solution in Vaporooter which, upon learning of Fields' preference, agreed to partner with the utility and work with the utility crews, teaching them the company's methodology and products.

Fields found one part of Vaporooter's application method — pre-rinse — especially attractive. The line is lightly cleaned before application of the herbicide, and Fields believes that gives the treatment a better chance of success.

After pre-rinse, the root-control agent, which has a shaving cream consistency when activated, is dispersed from a tank on one of the utility's five Vactor 2100 Series combination cleaning trucks, using a low-pressure nozzle. The process is similar to a standard pipe-cleaning run. The hose and nozzle are propelled from a manhole to the next manhole upstream. The crew then activates the dispersion of the chemical from the tank, and as the nozzle and hose are retrieved, the line is "foamed back." This gentle application eliminates the roots and keeps regrowth at bay for two to three years on average.

Getting buy-in

These new approaches were not an instant, easy sell for Fields. As a newcomer, it was challenging to get buy-in from crews that included many veterans of 15 years or more. Although they weren't opposed to trying new things, they were skeptical.

"Now, instead of instantly reaching for the tough mechanical tools, we see the condition of our line segments first. That gives us the opportunity to stop, think and select the right mechanical tool or method that will do the job but create no harm."

Dan Fields

Fields made a point of communicating that if the new methods didn't work or show significant benefits, they could always go back to the old ways. That helped encourage everyone to try it and see what would happen.

"Will Rogers said it best," says Fields. "People's minds are changed through observation, not argument." Case in point: The CCTV pipeline inspection group raised concerns about the Recon program. Accustomed to working only in the traditional PACP assessment, they considered it odd to run a camera down a line just to see how dirty it was — the camera seemed an expensive tool for that purpose.

To overcome that, Fields and his leadership team took a stance of complete transparency, sharing data in crew meetings, demonstrating what the team was accomplishing, and giving crews a chance to experience it for themselves.

In the case of the CCTV vans, the Basin Recon program showed savings more than 50 percent in operations and maintenance costs for cleaning, easily justifying the shift in camera usage. That, along with the change from mechanical root abatement to in-house chemical treatment, helped Colorado Springs get down to zero SSOs from an average of 10 per year in just a few years. With dramatic results like these, even crew members who were most skeptical at first are now on board and appreciate the insight a fresh perspective has brought.

Bottom line

The motivation for developing any new program or approach should always be the customer, Fields says. "We're owned by them, and we need to give them the best bang for their buck," he says. "That was the motivation behind looking at things a different way.

"Coming into this side of the utility was a big step for me. There was a lot I had to learn, but you're never too old to learn something or try something new. Never stop looking within as well as outside, and you'll consistently find things that can help you work smarter versus harder, no matter how many years of experience or what level of knowledge you possess." ✦

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(See ad page 29)

ROOTS

By Peter Litterski

Hydrostatic cleaner

The **Model 800 hydrostatic sewer cleaner from Electric Eel** can clean 4- to 24-inch pipelines for distances up to 650 feet. A hand lever controls the infinitely variable cleaning speeds through an automatic transmission at full torque from 50 to 1,000 rpm. The unit runs 8-foot sectional heavy-duty self-feeding cables that require no handling by the operator and allow fast cleaning. Snap-lock couplings provide easy and dependable joining of the heavy-duty cable sections with no setscrews, nuts or loose pins. An 8 hp gasoline engine or an optional 9 hp diesel engine provide ample horsepower. **800/833-1212; www.electriceel.com.**

New blade design

The **Puma Fang cutter saw blade from Southland Tool** has heavy-duty saw blades in a sectional 120-degree opposed formation to the root cutter axis. The blade is designed to rip, whip and cut roots from the center outward in a circular circumferential mode and with initial contact in the center where a hardened steel point guides the cutting section into the center of the root mass. The design uses a heavy-duty saw blade configured into a 1-inch hub for a hydraulic root cutter. The blade is available in sizes from 6 to 18 inches. **714/632-8198; www.southlandtool.com.**

Root cutter kits

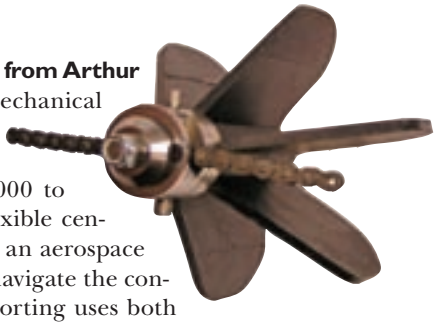
Pro Root Cutter kits from Amazing Machinery are designed for 3/8- or 1/2-inch NPT jetters. The high-speed rotating nozzle is designed to cut roots and remove scale and debris. The kit operates with wire extensions in PVC and clay tile lines and with chain extensions in iron pipes. Users can change from wires to chains quickly with only an Allen wrench. The 3/8-inch kit is recommended for use with 18 hp or larger jetters, and the 1/2-inch cutter for 24 hp or larger jetters. Kits include a stainless steel rotating head, chains and wires for 3-, 4-, 5- and 6-inch lines, and a storage box. The company will custom-drill the orifices. **800/504-7435; www.amazingmachinery.com.**

Jet-powered cutter

The **O'Brien Root Cutter, a hydrojet-powered cutter from Spartan Tool,** includes hydraulic motors that use the flow from a waterjet to propel themselves down sewer lines to root intrusions and blockages. Case-hardened, high-speed cutting saws then rip and shred roots.

The unit comes in an impact-resistant toolbox with quick-change skids to center the unit in 6-, 8-, 10-, 12- and 15-inch lines. The circular, compressible spring-like saws are sized to stay just under the pipe diameter and have cutting teeth on both sides to ensure complete root removal. The cutter operates on 3/4- or 1-inch hoses at pressures up to 2,000 psi and flows from 35 to 60 gpm. **800/435-3866; www.spartantool.com.**

Jet-driven cutters



The **Cnt-r-KUT Elite cutter from Arthur Products Co.** is a rotating mechanical tool with interchangeable chain and cable on the same rotor. The unit operates at 2,000 to 10,000 psi. The lightweight, flexible centering device, engineered from an aerospace elastomer, allows the cutter to navigate the contour of the pipe. Advance jet porting uses both rotor sidekick jets optimizing rotational force and rear thruster jets for maximum propulsion. The tool is available in 3/8-, 1/2- and 1-inch NPT. **800/322-0510; www.arthurproducts.com.**

Multipurpose cutting nozzles

Lumberjack cutters from NozzTeq are low-torque, variable-speed, multipurpose nozzles. The cutting chains rotate at 10,000 to 50,000 rpm. The cutter is designed to cut roots but also effectively clears concrete, tuberculation, grease, protruding laterals and other obstructions.

Low torque means the cutter will not get stuck, harm host pipe, or spin off the hose end. The cutters are sealed, grease-lubricated, and water-cooled for low maintenance. The drive shaft and turbine are made of hardened steel, and the supply tube is made of stainless steel. Nozzles last for seven to 15 years and are easy to rebuild. Six models clear pipes from 3 to 48 inches. The kit includes turbine, water supply tube, chain plate/pull plate, tow ring, cutting blade, sleds, five sets of chain per sled size, propelling nozzle with jets and adapter, spanner wrench, hand tools and toolbox. **866/620-5915; www.nozzteq.com.**

Effective chemical

Vaporooter uses a combination of metam sodium and dichlobenil to destroy roots and inhibit regrowth. Metam sodium destroys root cells on contact while dichlobenil bonds to pipe walls, joints and cracks, preventing new root growth. The treatment is applied with the Jet Set Commander that lets operators go from jetting to foaming at the push of a touchscreen button and then retrieve the hose while filling the pipe with foam. The computerized system can be added to most jet trucks. **800/841-1444; www.vaporooter.com.**

Low-maintenance nozzles

Root Rat cutting nozzles from Chempure are used with jetters from 11 hp units to large truck-mounted models. Manufactured of hardened stainless steel, the cutters come with a toolbox with two interchangeable rotors: one with cables and the other with chains. The combination kit includes extra chain, cable and bearings. They need no repair or rebuilding other than bearing replacement, which can be completed in less than two minutes for less than $10 in parts. **800/288-7873; www.chempure.com.**

Multifunction tools

ClogChopper multifunction cutting tools from General Pipe Cleaners have six self-sharpening blades that dig into encrusted debris and root masses and grind up stoppages, scale and crystallized urine without pipe damage. The spherical design maneuvers around tight bends and traps, thoroughly and safely cleaning metal, plastic and clay pipes. The tools are available in sizes from 1 to 4 inches and can be used for clearing stacks, downspouts and mains. **800/245-6200; www.drainbrain.com.**

Two-part foam

RootX is an easy-to-apply two-part foaming chemical with a root regrowth inhibitor used by plumbers and homeowners. Once the two-part mixture has been introduced into the pipeline it is charged with water, causing it to foam and coat the pipe walls, roots and other surfaces. The product can be applied in larger lines with jetting equipment and the RootX applicator. **800/844-4974; www.rootx.com.**

High-torque cutter

The **Smart Cutter from Sewer Equipment Co. of America** combines the power of a high-torque root cutter with the low maintenance of a chain cutter. There is no need to keep the cutter in an oil bath. It effectively removes roots in lines from 4 to 15 inches and is available with curved or flat blades. **800/323-1604; www.sewerequipment.com.**

Chain cutters

The **Turbo family of chain cutters from USB-Sewer Equipment Corporation** are made of tempered stainless steel. The chain retainer is driven by a high-performance turbine for effective removal of roots, grease and mineral deposits from 4- to 36-inch lines. The flexible chains do not damage pipes. The Turbo II–IV flexible chain cutters have a continuously adjustable guide skid that can be dialed to within 1/16 inch. Attachments include a diamond tap cutter that cuts out protruding laterals. **770/984-8880; www.usbsec.com.**

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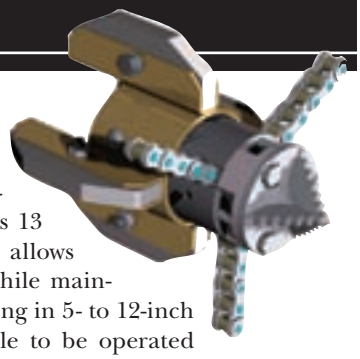


Effective pipe cleaning

The **Enz Golden Jet 10.125TR** turbine nozzle operates at flows as low as 13 gpm at 2,000 psi. The turbine design allows for lower flow and less water usage while maintaining high torque for effective cleaning in 5- to 12-inch lines. Sealed bearings allow the nozzle to be operated with clean or recycled water. The tool removes roots as well as grease, solids, mineral deposits, concrete and grout. With the complete kit, users can select precut chains, skids, and two head styles. **877/369-8721; www.enzusainc.com.**

Jetter nozzle

With a working pressure of 3,000 psi, the **Root Ranger 3000 jetter nozzle from RIDGID** can remove root obstructions, grease, sludge and mud. The rear-facing jet produces a stream that shears roots from the drain walls. The jet also blasts away buildup and debris, while the pointed penetrating head helps the nozzle push through obstructions. **800/474-3443; www.ridgid.com.**

Foaming units

Mini-foamer systems from Municipal Sales come in two portable models: a hand-truck-mounted version that can apply at 2.5 gpm and an equipment case version that applies at about half that flow. The units combine a chemical solution with compressed air to create the foam and come with factory-set proportioning. Foam is delivered through a flow-through plug/hose assembly that keeps the foam isolated and directed toward a downstream target area. Users can also use an open-ended hose to apply grease- and odor-control products to grease traps and wet wells. Units operate on 110 volts, are self-contained, and come with all necessary hoses. **518/747-2044; www.municipalsales.net.** ✦

AP/M PERMAFORM Names Wolf Regional Manager

AP/M PERMAFORM named Robin Wolf East Coast regional manager for its trenchless renewal and replacement equipment and technologies. She has been involved in the precast concrete industry since 1999.

Robin Wolf

Greyline Adds Office, Warehouse Facility

Greyline Instruments, Ontario, Canada, completed construction of its office and warehouse facility in May. The 8,500-square-foot building is part of a multi-phase expansion that includes renovation of the existing manufacturing facility. Work is scheduled for completion this fall. Greyline designs and manufactures flow and level instruments for the water and wastewater industry.

Super Products Names Reis Industrial Sales Manager

Super Products LLC named Mike Reis industrial sales manager for its Western Region. Reis has a sales, rental and customer service background, focusing on heavy-duty truck and equipment suppliers.

Mike Reis

Coxreels Expands Manufacturing Capabilities

Coxreels is expanding its manufacturing facility. The added space will enable the company to double capacity levels by the end of 2011.

ITT Names Sabol to Lead Strategy, Development for Water Company

ITT Corp. appointed Colin R. Sabol to lead Strategy and Business Development for the stand-alone, publicly traded water company it will spinoff this year. Sabol is currently responsible for Strategy and Business Development for ITT's Fluid and Motion Control group and will continue to lead the company's strategy, marketing, business planning, mergers, acquisitions, product development and organic growth initiatives.

StoneAge Receives Export Award

StoneAge Tools Inc. received the Governor's Award for Excellence in Exporting at World Trade Day 2011 in Denver. The award recognizes Colorado companies that demonstrate a commitment to international trade. StoneAge was selected in the small manufacturer category as a world leader in providing tools and equipment for waterblast cleaning. Based in Durango, Colo., the company, which exports to 43 foreign countries, also received a site visit from the governor in June.

Gov. John Hickenlooper (left) presents the Colorado Award for Excellence in Exporting to StoneAge CEO Kerry Petranek.

RapidView Hosts SeptemberFest 2011

RapidView IBAK North American presents SeptemberFest 2011 at its headquarters in Rochester, Ind., Sept. 14-15. New and emergent pipeline inspection technologies will be presented along with classes on repair and equipment maintenance and PACP software. For more information, call 800/656-4225 or visit www.rapidview.com. ✦

Product Spotlight

Sewer Nozzle Delivers Greater Pulling Power

By Ed Wodalski


WGP-1 Warthog from StoneAge

The 9.1-inch-long, 4.8-inch-diameter maximum thrust WGP-1 Warthog sewer-cleaning nozzle from StoneAge is made for removing roots and grease and flushing 8- to 36-inch lines.

Designed to produce greater forward thrust, the puller nozzle has five jet ports, including a boring jet offset at 15 degrees and four jets at 155 degrees for forward thrust. The 12.1-pound nozzle has an operating pressure of 1,500 to 3,000 psi, rotation speed of 150 to 300 rpm, flow of 50 to 80 gpm and pulling force of 100 to 140 pounds. The inlet port comes in either 1 NPT or BSPP.

Controlled rotation of the five jets provides complete coverage of the pipe wall allowing adequate dwell time for cleaning, says Scott Hardy, customer service specialist. Replaceable StoneAge AP2 Attack Tips also produce a high-quality jet for improved wall cleaning.

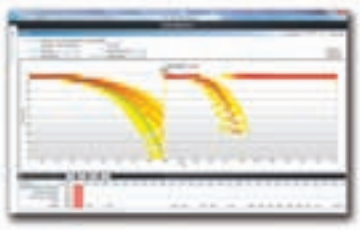
"With this tool, the P is for pulling," Hardy says. "We have a lot of municipal customers that typically have runs longer than 500 feet. They may have 600 to 900 feet of 1-inch hose on their combination trucks, and it takes maximum thrust to pull that much hose off a reel. I just spoke with a customer in Buena Vista, Calif., and they were able to pull with this tool farther than they had ever been able to go before. They went 270 feet past the previous longest distance."

Where water usage is an issue, the nozzle's ability to quickly run up a line enables crews to clean on retrieval, flushing debris back with the nozzle. Made of non-corrosive stainless steel, the nozzle has a replaceable centralizer and positive high-pressure seal that typically lasts a year.

"The only period maintenance we recommend is the fluid inside the tool for speed control and bearing lubrication," Hardy says. "We recommend that every 40 to 60 hours of use they check the fluid level in the tool." **866/795-1586; www.stoneagetools.com.**

Radiodetection Introduces Locators with Compass, DOP

The RD7000 line of cable and pipe locators with compass from Radiodetection include dynamic overload protection, extending the locator's area of operation into electrically noisy environments. The compass feature provides a visual orientation of the target pipe or cable. **877/247-3797; www.radiodetection.com.**



InfraMetrix, Solutions Modex Launch Decision Support Software

InfraModex infrastructure information decision support software from InfraMetrix LLC and Solutions Modex Inc. is designed to help municipalities predict and prioritize capital expenditure spending on physical infrastructure and develop long-term, economical intervention plans while maintaining an acceptable level of service. The software uses aging models and user-defined decision trees, such as water distribution, wastewater collection and roads to simulate any number of maintenance scenarios. **813/740-2510; www.solutionsmodex.com.**

Condux Offers HDD Backreamers

The Triple D line of horizontal directional drilling, compaction boring tools and backreamers from Condux International includes solid body and solid body fluted reamers, wing reamers, clay reamers, as well as stacked plate and barrel reamers. All units are manufactured from either solid alloy steel, tool steel or heat-treated alloy steel. Each reamer is available in a range of sizes with various swivel options (when applicable). **507/387-6576; www.condux.com.**

Hammelmann Introduces RD Flex 3000 Spray Head

The RD Flex 3000 spray pistol head from Hammelmann is designed to replace traditional pneumatic spray pistols and tumble boxes. Rotation speed can be adjusted by turning the adjuster ring. Nozzle heads can be easily exchanged to suit the work at hand or pump being used. The head can be used with any type of bypass spray pistol. **800/783-4955; www.hammelmann.com.**

HOBAS Offers Centrifugally Cast Pipe

Centrifugally cast, fiberglass-reinforced, polymer mortar pipe from HOBAS Pipe USA is corrosion-resistant and has a life expectancy of 100 years. Available in standard 20-foot sections, pipe diameters range from 18 to 110 inches for both pressure and gravity applications. **800/856-7473; www.hobas.com.**

Prime Resins Introduces Kick Fast Catalyst

Kick Fast catalyst from Prime Resins enables Prime Flex 920 to react and reach full rise three times faster. The single-component, water-activated, hydrophobic polyurethane injection resin can be used to stop gushing leaks in below grade structures, fill voids and stabilize soils. **800/321-7212; www.primeresins.com.**

MJK Offers Submersible Level Transmitters

Series 700 submersible level transmitters from MJK continuously measure water levels in wells and other clean-water applications where an opening or wellhead is too small for conventional level transmitters. The transmitter has an outside diameter of 0.63 inches and has a semirigid and slick polyethylene cable, enabling it to slide deep into small I.D. pipe. **877/655-5465; www.mjk.com.** ✦

LISTENING FOR LEAKS

Hykron listening device and Eureka 2R locator system from ADS provide simple tools for efficient and accurate leak detection

By Erik Gunn

ABOVE: Luis Mijares lowers the Hykron accelerometer into a water valve manhole. INSET: The Hykron accelerometer, adhering to the valve via its built-in magnet. (Photography by Erik Gunn)

Leak-detection technology continues to get smaller, easier to use, and more precise. With pinpoint leak-location equipment, workers can target excavation for repairs more precisely, avoiding the disruption and expense of unnecessarily large digs or "dry holes" that find nothing.

ADS Environmental Services, a unit of ADS LLC, distributes and supports leak-detection devices manufactured for ADS under private label by Primayer Ltd. ADS LLC is a U.S. based water and wastewater products and services company and is a business unit of IDEX Corporation.

The Hykron in its carrying case.

Many products ADS sells are complementary, deployed together in a systematic procedure that methodically narrows down the location of a leak. Two recent entries often used in tandem are the Hykron listening system and the Eureka 2R correlating system. These devices are designed for ease of use without extensive training, especially by general utility workers. ADS employees Luis Mijares, senior business development manager, and William Doyle, project manager, demonstrated the equipment in Chicago on April 7.

Walk-around

The Hykron system is an acoustic listening device consisting of an accelerometer, microphone, headphones, and a simple handheld control unit containing just two keys: a push-to-listen button, and a volume control.

The microphone is just a little larger than an empty cardboard toilet paper roll. It has a magnet mounted at one end to hold it in place on a hydrant, valve or other water-service fixture to listen for a leak. While it can be lowered by its power cord into a manhole, extension rods can be attached to extend its reach. The Hykron is powered by a conventional 9-volt battery. Although the unit is turned on as soon as the microphone is plugged in to the controller, the push-to-listen button helps prolong battery life.

The Eureka 2R dual radio locator set includes two transmitters, one blue and one red, with screw-on antennas. Each unit includes a plug-in transducer listening device with a magnetic base, again for attaching to water service fixtures. The locators are powered by rechargeable nickel-cadmium batteries. The carrying case includes a built-in recharger that can be plugged into a conventional outlet or automotive cigarette lighter.

A handheld control unit, essentially a miniature computer, is included with the transmitters.

TECHNOLOGY TEST DRIVE

EQUIPMENT:
Hykron acoustic listening system and Eureka 2R dual radio locator set

MANUFACTURER:
Primayer Ltd., distributed by ADS Environmental Services, a business unit of IDEX Corporation

ADS Environmental Services
800/633-7246
www.adsenv.com

LOCATION OF DEMO:
Chicago, Ill.

DEMONSTRATED BY:
Luis Mijares and William Doyle, ADS Environmental Services

LIST PRICES:
Hykron, $985;
Eureka 2R, $14,000

ABOVE: One of the two Eureka 2R locator units. UPPER INSET: The control panel for the Eureka 2R. LEFT INSET: The transducer from the locator unit, adhering to the valve via its built-in magnet.

The control unit has a liquid crystal display view screen and a simple control panel. The panel consists of a numbered keypad like a telephone's and unlabeled keys that correspond to a menu the view screen displays when it is turned on. In use, the two transmitters receive sound from a leak and send the information to the control device, which uses it to calculate a leak's location between the two units.

Operation

Mijares and Doyle demonstrated the technology in a residential neighborhood on the South Side of Chicago at a site where Doyle had previously detected leaks for the city, with which ADS has a leak-detection contract.

Before the demonstration, Doyle had surveyed the neighborhood for leaks and had found one near the intersection of W. 109th Street and S. Whipple Street.

Mijares unpacked the Hykron from its case and attached its handheld control unit with a power cord tether. After Doyle opened a manhole over a water valve, Mijares lowered the Hykron by its power cord until the magnet on the face of the microphone clicked solidly on the valve. With the earphones on, he turned on the controller.

Through the earphones, a steady rushing noise could be heard: the sound of water passing through a leak. Water passing through a sealed pipe would not be audible, although a T-joint or a service could also create that sound.

Having established the presence of a leak somewhere in the vicinity, they set out to narrow down the location using the Eureka 2R locators.

Mijares unpacked the transmitters and their control panel, screwed the antennas on each locator, and plugged in their microphone cords, which turned them on. At the same manhole where he had deployed the Hykron, he placed the blue locator unit on the ground and lowered its microphone so it could attach to the valve via the magnet.

Doyle, meanwhile, used a measuring wheel to record the exact distance from the service manhole to a hydrant believed to be on the opposite side of the leak. There he attached the red locator unit's microphone. "Both this valve and that hydrant are connected to that pipe," Mijares said. "Those are going to be our two listening points."

Once the transmitters were positioned and their control unit was turned on, Mijares observed the system's findings on the control's view screen. Each transmitter sent a signal to the control unit, and the view screen displayed a graph consisting of numerous vertical lines. One end of the graph represented the blue transmitter, the other end represented the red one.

Based on differences in the signals from the two transmitters, the control unit automatically calculated the relative position of the leak between the two units, displaying that point with a sharp upward spike in the graph.

Mijares used the control's keypad to enter the distance Doyle had measured between the two transmitters (326 feet) and to enter information about the water pipe (8-inch cast iron). He then punched a key on the panel to correlate, and within seconds, the device calculated the leak location, illustrated by the spike as 38.4 feet from the blue transmitter unit and 287.6 feet from the red unit.

Using the measuring wheel to ascertain the distance, Mijares then walked back from the blue unit 38.4 feet. He then used a Mikron ground microphone to further pinpoint the leak's location. (This product was the subject of a "Technology Test Drive" in the April 2010 issue of *MSW*.)

The Eureka 2R locator kit in its carrying case.

"The correlator will get us close, and how close is going to depend on how accurate the information is that you put into it, based on our knowledge. The ground microphone puts you right on top of it. So before you mark it and dig, you want to make sure that you're as close to it as possible."

Luis Mijares

"The correlator will get us close, and how close is going to depend on how accurate the information is that you put into it, based on our knowledge of the pipe configuration and properties," Mijares said. "The ground microphone puts you right on top of it. So before you mark it and dig, you want to make sure that you're as close to it as possible."

Walking a straight line along the underground water pipe, Mijares

periodically stopped, rested the Mikron on the ground, and took a reading with the unit's control panel, which displayed a two-digit number. The number increased from one reading to the next, indicating that the leak was closer. When the number decreased on a subsequent reading, Mijares knew he had passed the leak and was moving away from it.

The controls for the devices were simple and easy to understand. It appeared that very little training would be required for utility workers to operate the devices and understand the information they put out.

Because Doyle had previously carried out this same procedure under the ADS contract with the city, he had already marked the spot of the suspected leak location with spray paint. Once the location was pinpointed with the equipment, Doyle opened a nearby sewer manhole. There, water could be seen flowing into the line that was almost certainly coming from the leaking water main.

William Doyle places the red locator unit, attaching its transducer (via a magnet) to a hydrant.

Observer comments

With both the Hykron and the Eureka 2R units, as well as the Mikron device, the distinctive sound of the leak was readily apparent as a steady rushing noise. The controls for the devices were simple and easy to understand. It appeared that very little training would be required for utility workers to operate the devices and understand the information they put out. The Eureka 2R controls are based on a simple on-screen menu, which contributes to its ease of use.

Manufacturer comments

Mijares explained that while a conventional, properly working pipe would not ordinarily produce any noise, T-joints and services could produce a sound similar to a leak. When using the system, therefore, it's important to check maps for any such features that could complicate interpretation of a sound. "Like any leak-detection equipment, it tells you that there's a noise there," he said. "It's up to the operator to determine whether it's a leak."

Additionally, differences in materials can change the response of the system, so that if a line is made of one material, but patched with another, that could add some uncertainty to the exact location with the correlator system.

WATCH IT IN ACTION

To learn more about the ADS Environmental Services equipment featured in this Technology Test Drive, view the video at www.mswmag.com. ✦

PACP CERTIFICATION: WHAT IT REALLY MEANS

Certified software for pipe inspection must meet stringent standards, including the ability to transfer data seamlessly between programs

By Ted DeBoda, P.E.

When it comes to the NASSCO Pipeline Assessment and Certification Program (PACP), we often say, "It's all about the data."

Consistent and reliable data is the backbone of PACP's success, and the many PACP-certified software programs provide a wide variety of features that allow utility owners to assess assets, help determine corrective measures, and help prioritize rehabilitation.

However, certified PACP software has other significant benefits, such as providing flexibility in bidding CCTV inspection. This flexibility allows contractors to bid on inspection projects using software they already own, without having to buy and learn new software to collect data in the field. The goal is to help municipalities attract more qualified bidders (which generally means lower cost), while being able to import the data into software of their choice.

What it all means

To collect quality PACP data at competitive costs, municipalities must understand what it means when they solicit bids for inspections using PACP-certified software. PACP certification means bidders typically can use any certified software listed on the NASSCO website.

Even though the utility may use different software to manage its data, if both the utility's and the inspection firm's programs are PACP-certified, the data is required to transfer seamlessly between programs.

NASSCO and other organizations in our industry take this issue very seriously and are acting to protect the integrity of valuable inspection data. For example, NASSCO has a Software Vendor Committee whose purpose is to work with all PACP-certified software vendors to ensure that they meet the certification requirements.

The main requirement is that the software has PACP import and export capability (along with Manhole Assessment Certification Program and Lateral Assessment Certification Program import and export capabilities if so certified). These requirements provide the added value of enabling CCTV contractors to bid on projects without changing their software, while allowing municipalities to import the data into software they already use.

Protecting integrity

Unfortunately, the reality is that some software vendors violate their agreements with NASSCO by not including all the standard certification requirements, including import/export capability. The Software Vendor Committee provides a dynamic forum in which software competitors identify issues associated with these violations. But we can only do so much — municipalities also must make sure the software used to collect PACP data has the proper characteristics to transfer the data into their PACP software. Here are two simple questions to ask about PACP software:

- Does the software have the PACP, MACP or LACP certification seal? Don't be taken by the term "PACP Compliant."
- Does the product have PACP/LACP/MACP import and export capability? If not, it may be in violation of the maker's Software Vendor License Agreement with NASSCO. If this is in question, NASSCO can test exported data from the software.

There are currently 13 PACP-certified data-collection software vendors and three PACP-certified asset management software vendors. Each software has unique arrays of tools to facilitate the management and use of data collected in the field, including automatic validation of PACP data, ability to create different reports, ability to manipulate and query data to support rehabilitation recommendations, and product support.

The collection of consistent and reliable CCTV data is one of the most expensive undertakings in assessing underground pipelines. By requiring import and export capability in PACP software, we hope to open up the playing field to new contractors using data collection software with which they are already proficient.

We can only meet our mission — to set industry standards for the assessment and rehabilitation of underground pipelines and assure the continued acceptance and growth of trenchless technologies — if data and the software that interprets it meet the highest possible standards of quality. ✦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org. NASSCO is located at 11521 Cronridge Drive, Suite J, Owings Mills, MD 21117.

classifieds

see photos in color at www.mswmag.com

BLOWERS

New Roots 27" 1021 PD blower. In stock, ready to ship or install. **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M08)

VFC200P-5T, FUJI Pumps, Regenerative Blowers, Ring Compressors. All models, accessories. Authorized distributor. Authorized parts and repair center. Call 888-227-9822. www.carymfg.com (MBM)

CATCH BASIN CLEANER

2008 American La France Condor with a new VacAll VS10DC, 10-yd. debris body, dual steer dual sweep street sweeper and catch basin cleaner. (Stock #1791V) **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M08)

DEWATERING

20-Yd. Dewatering Filter Box: Complete rollover tarp system, filter media, loading manifold, drain ports and washout ports. interior epoxy coated, exterior polyurethane top coat. $18,000
Polymer system $9,000
Call for more info.
863-984-8994 FL CMP08

DRAIN/SEWER CLEANING EQUIPMENT

Dealer Demo Blowout - Outpost with washdown and small generator slide-out. Rovver 125 steerable crawler with multiple wheel sizes and configurations. RC90 color, pan, tilt and zoom camera with pressurization kit for crawler/camera. Backeye camera with auxiliary tri-pod LED lights. Adjustable elevator kit. 19" flat color monitor DVDR disc burner with text generator, in excellent condition- System with or without self contained Outpost. Save $$$$. Call now!!! 718-779-1000 NY. (M08)

HAZARDOUS WASTE UNITS

1998 Mack RD6885 with a 3000 US gallon DOT certified carbon steel vacuum tank unit. (Stock #6653V) **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M08)

JET VACS

1999 Sterling cab and chassis with a Vactor 2100 combination vacuum loader and high pressure sewer cleaning system. (Stock #2129V) **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M08)

1998 to 2008 Jet/Vacuum high pressure combination sewer cleaning system in good working condition. ALSO, a 2010 high pressure cleaning system with 300-360 GPM @ 2000 psi in excellent condition. 240-375-6582 MD. (M09)

2008 Sterling LT7501 with a VacAll AJV1015, 10-yd. debris body, 1500 gal. water, combination vacuum/jetting unit. (Stock #13366) **www.VacuumSalesInc.com, (888) VAC-UNIT (822-8648).** (M08)

JETTERS: TRUCKS

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STARTING OUT RIGHT

New employees and their teams will function better if the emphasis from the start is not on inclusion and relationships but on getting a quality job done

By Ken Wysocky

As the public sector grapples with a wave of retirements — some have called it the "silver tsunami" — more and more new employees are taking their place. To get the most from new hires, writer Jeff Haden suggests that organizations follow some words of wisdom from a Toby Keith song: A little less talk and a lot more action.

Haden suggests that managers skip the formal lunches, meet-and-greet sessions and dog-and-pony shows and focus on helping new people hit the ground running.

"Everyone is rightly concerned about inclusion, diversity and making people feel comfortable and part of a team," says Haden, who spent 20 years in production management and has written more than 30 nonfiction books. "That's all very positive. But I think things have shifted too far to that side. You're hired to do a job. And as an employee, you're a little nervous about getting along with people, but a lot more nervous about doing the actual job."

Contributing sooner

That doesn't mean there isn't a place for being courteous and polite and making introductions on new employees' behalf. Haden just prefers more emphasis on helping employees become contributors quickly and less on building relationships. There's a narrow window of time for managers to make a strong, lasting impression on new hires, so it behooves them to send a message that they're working for a performance-based organization that values results.

"Giving new employees a chance to succeed as early as possible makes them feel better about themselves and sets the tone from an organizational point of view that we're here to work," Haden says. "This also gives managers a quicker look at whether employees have the skills to succeed, so it benefits both the employer and the employee."

And if organizations fail to set a positive, action-based tone, changing it is a lot like turning an aircraft carrier: It can take a lot of time.

Relationships develop

Haden doesn't discount at all the value of strong workplace relationships. He just believes they take time to develop, so it doesn't make sense to strive to make someone feel integral to a team right away.

"Over time, people will develop those relationships while working with people and working through problems with them," he observes. "Some people will never develop interpersonal relationships, and that's okay, too. In the long run, new employees will feel like part of a team after they work together — you can't force-feed it."

In the same vein, it doesn't pay to give new hires too much context for their jobs. For example, Haden says that in theory it's nice if new sewer inspectors know all about what the other departments do and understand how they fit into the scheme of things.

"But when you spend a lot of time introducing them to people in other departments and giving them a big-picture overview, they can't absorb all that," he says. "What's the point if it doesn't help them perform their job better?

"As a new employee, I never liked this approach. I remember once spending my first five days meeting people. Now, I met a lot of great people and saw a lot of cool stuff, but felt like I wasn't contributing. I believe that if you have a good day at work, it's usually not because you made ten new friends — it's because you got something accomplished and did a great job. I think that often gets lost early on."

Immediate feedback

Another common managerial mistake is not letting new employees know when they make mistakes, for fear of making anxious rookies even more nervous, damaging their confidence or breaking their spirit. "If it's important enough to do, it's important enough to do it right," Haden says. "Step in and in a tactful, constructive and positive way, explain the right way to do something."

Most people would rather do things correctly, even if it means getting feedback along the way, than to do it wrong and have no one say anything. Confrontation-adverse managers should keep in mind that whatever discomfort they may feel in pointing out mistakes is momentary. Letting it go usually results in more damage.

"If you want to create a performance culture, you have to actively build one," Haden argues. "You can't step back and just hope that somehow, someone will get there. Besides, it's easier to correct someone new than a 20-year employee who's set in his ways. How and when you correct someone is really important, and constructive criticism is more likely to be well received early on."

The opposite also is true: Haden doesn't believe managers should encourage people to critique processes and procedures until they've been on the job for a significant time. As he puts it, employees shouldn't try to reinvent the wheel until they fully understand how the wheel works.

"If new employees question things because they don't understand something, that's okay," he says. "But it's not their place to tell you things would work better if you just did x, y and z. If that happens, tell them it's cool that they have ideas about improving processes, but to hold that thought until they get settled in."

Empowerment can wait

The same principle holds true when it comes to giving new employees latitude to make their own decisions. Haden advocates giving that freedom after they've earned it. Giving people decision-making authority on day one isn't wise because managers don't yet know anything about their decision-making skills, and they don't have any context for making decisions.

"A lot of people these days assume that if you don't do this right away, you're stifling new employees and making them button-pushers," he says. "But I think it's something that's earned, not given. Don't hand it out automatically."

In the long run, Haden says managers will get more out of new employees by getting them busy than by spending time on feel-good policies and procedures. ✦

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