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A carefully coordinated effort
helps wastewater crews
manage the largest collections
system in the country

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Kent Carlson
Los Angeles Collections
Division Operations Manager
in Los Angeles

LA STAGES ITS OWN SUCCESS



A carefully coordinated effort helps wastewater crews manage the largest collections system in the country

Wastewater Collections workers Jose Mendez and Elton Howerton, one of the LA City Collections Division's hydro crews, clean a 300-foot section of sewer main in a residential San Fernando Valley neighborhood north of Los Angeles. (Photography by Collin Chappelle)

By Jim Force

The term “Hollywood Hustler” may bring to mind a West Coast shyster intent on stealing your money.

But at the Los Angeles Wastewater Collections Division, the term means something far more beneficial. Hollywood Hustler is the name of a unique tool they’ve developed to facilitate cleaning twisty branch sewer lines in old areas of the city where there is no manhole access.

Part of the city’s sewer system serves an old section of Hollywood Hills, explains Operations Manager Kent Carlson.

“The developer put in a number of branch sewers with sharp bends and angles,” he explains. “The Hustler has a 45-degree angle head that glances around the corners and enables us to get our rodding equipment through bends and turns in the pipe.”

Homemade tools are just one of

the weapons the LA collections team uses to keep the sewer system clean and functional. Some 350 employees use more than 100 major pieces of equipment — including 75 dedicated cleaning units — and a comprehensive set of standard operating procedures to ensure uninterrupted service to the city’s 4 million residents and 27 contracting cities.

“We run around the clock,” Carlson says. “Our sewers never sleep.”

The LA system

At 6,700 miles, LA’s sewer system is the largest wastewater collections system in the United States. It would stretch across the U.S. and back, and is organized into six separate yards, which are home to 11 divisions. The smallest is a 60-square-mile area in the center of the city, having 300 miles of sewers — about the length of the entire system in many major American cities. Carl-

son says that the district approach organizes the workload and allows the sewer crews to focus on issues particular to specific areas of the city, rather than taking on the entire system all at once. Crew assignments and work order allocations are based on the six yards, Carlson says.

“Each yard has a supervisor and a crew leader on the trucks,” he explains. “But we share the responsibility of getting all the work done. We move crews around from one yard to another. We have no animosities with one yard versus another, and we work as a team.”

The system carries 400-plus mgd of wastewater to the four treatment plants operated by the city. Wastewater flows mostly by gravity, although 48 pumping stations help move wastewater in the beach areas and low-lying sections of the city.

Ninety-five percent of the system is vitrified clay, which despite its age,

is holding up relatively well, Carlson says. Most spills and overflows are caused by tree roots, but through the efforts of Carlson’s crews, spills have been reduced significantly in the past few years. The rigorous cleaning schedule is one reason, but Carlson points out another: “It’s a testament to the tenacity of our guys and gals out in the field, in all kinds of weather and conditions. They’re very detail-oriented and do a bang-up job.”

The sanitary system is completely separate from the storm sewer system, which itself is another 1,200 miles in length.

Despite being in a major earthquake zone along the West Coast, Carlson says seismic activity is not a major concern. “The Northridge earthquake in 1994 did a lot of damage, and it took us a long time to assess and fix the damage. But we’ve had no major quakes since then. The ABS [acrylonitrile butadiene sty-

(continued)



Wastewater Collections worker Elton Howerton lifts the lid on a manhole to begin cleaning a 300-foot section of sewer in a residential area in the San Fernando Valley.



Wastewater Collections worker Jose Mendez uses a mirror to reflect light down a manhole while cleaning a sewer main.



PROFILE:
Los Angeles,
California, Wastewater
Collections Division

DATE ESTABLISHED:
Original sewer lines date to the city's establishment in the late 1700s.

POPULATION SERVED:
Approximately 4 million, plus 27 contracted communities

AREA SERVED:
Los Angeles and surrounding contracting communities

WATER/WASTEWATER INFRASTRUCTURE:
6,700 miles of sewer pipe, ranging in diameter from 6 to 144 inches, 140,000 manholes, 48 pumping stations. Wastewater is treated at four facilities: Hyperion Treatment Plant, Terminal Island Water Reclamation Plant, Donald C. Tillman Water Reclamation Plant, LA-Glendale Water Reclamation Plant.

EMPLOYEES:
350

ANNUAL OPERATING BUDGET:
\$41 million

WEBSITE:
www.lacitysan.org

rene] piping and couplings we're using on new hillside lines are quite flexible and aren't affected much by movement."

Inspection, cleaning and maintenance

If you suspect that a system this big requires lots of equipment, you're right. Carlson's division operates the largest fleet of Vactor combination jet/vac trucks in the western hemisphere — 75 to be exact. They are among more than 100 pieces of major equipment the city uses, along with Champion rodding machines, Warthog Magnum sewer nozzles (StoneAge), Phantom nozzles from Advanced Infrastructure Technologies, Aries CCTV units, mechanical root saws, hand rodding equipment and more.

The cleaning is scheduled continuously, 24/7, with the objective of regaining at least 95 percent of the original sewer capacity. The division's QA/QC procedure mandates CCTV inspection and cleaning of 10 percent of the entire system each year — about 670 miles.

"In addition to our regular schedule, we inspect and clean some sewers every three to six months, or every one to two years, depending on this history of the pipe and where

it's located," Carlson says. "Some of our lines near restaurants have high grease loads that must be removed."

The city has developed a comprehensive program to reduce fats, oils and grease in the sewer system, and best management practices for both residential and commercial customers are published on the LA sewer website.

All commercial food establishments must control FOG by complying with the city's Industrial Waste Control Ordinance, which calls for adoption of best management practices and the installation of grease traps or interceptors, and limits the use of garbage grinders.

Roots are a special problem, exacerbated by recent drought conditions in Southern California. "Tree roots seek moisture in our sewers and can cause blockages in the lines," Carlson explains. "We have lots of trees of different kinds, depending on the various neighborhoods."

To combat root blockage, Carlson's crew uses both chemical control means — contracted out to a root control service — and aggressive root cutting programs to keep the lines free of clogs.

LA has also increased efforts to control and eliminate sewer odors.

New Air Treatment Facilities are being positioned at odor hot spots around the system. The ATFs use biofilters followed by carbon adsorption to eliminate odors that might otherwise create issues in local neighborhoods.

The topography within the service area is another challenge. Steep grades and hills often require the use of rodding machines — some of them manual — and the variety of special tools the division has built on its own.

Standard operating procedures

The division's standard operating procedures provide consistency in operations throughout the sprawling sewer system and army of employees. The printed manual is a living document, constantly being analyzed and updated as equipment and procedures change, not just sitting on a shelf somewhere.

Carlson says the SOPs are organized around three criteria: customer service, system performance and employee performance. Within these topics, SOPs cover everything the LA sewer crews do — from individual roles and responsibilities, to safety, maintenance, recordkeeping and more.

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THE HISTORIC ART OF SEWERING

If there were a sewer museum somewhere, Kent Carlson would be the odds-on choice for curator. He loves the old stuff.

He's got photographs of the old-school brick-lined elliptical sewer lines that once served cities like New York and Philadelphia. An old Babbitt book on sewers from 1906 is filled with post-it notes pointing out important developments. Another is the *Glossary of Water and Wastewater Engineering* from the 1960s, which he says "has everything in it that you might hear out in the field."

He hangs onto remnants of old sewer mechanisms. Old blueprints and equipment patents hang on the walls of his office.

The reason? "People need to see how they did business in the old days," he says. "As we instruct the young people coming into the profession, it's important they understand the history of their craft.

"Some of the old stuff is similar to what we have in the older sections of town." He adds that a lot of the older generation of sewers and equipment is still in service and doing a pretty good job. "It helps when you're going into a line to work on it. You have the database — when the line was built, what kind of tools to use."

Plus, he says, his collections division is losing a lot of knowledge as older, experienced employees retire. He says he's trying to keep an appreciation for the older sewers and sewer from fading to black, stressing that it's important that everyone in the profession knows something about what came before them.

"Everybody is covered," Carlson says. "Not just the crews on the street but managers and supervisors, as well. No one is excluded from the SOPs."

SOPs are targeted to all the different types of equipment the LA team uses. "Tools are different," Carlson says. "The SOP lists differ-

ent tools in each truck, how to use them, applications, maintenance. It breaks down what each tool does."

Recordkeeping is critical, Carlson says. "It's very important that we keep track of breaks, spills, cleaning data — whatever we encounter in a system the size of ours."



Despite their completeness, Carlson says the SOPs are only effective if they are applied. Employee buy-in is the key. "Our SOPs are not just drawn up," he says. "Everybody was involved in their formation. Everybody has a say [in what goes into the SOP]."

Tools of the trade

The Hollywood Hustler is just one of several homemade tools the Los Angeles Wastewater Collections Division has come up with to make their jobs easier and sewers cleaner.

The hydraulic can cutter is another. This water-operated hydraulic unit is designed to cut through protruding laterals. "Our older cutters use a diamond impregnated tip for cutting, and on vitrified clay pipe they work just fine," Carlson says.

"But some of the newer laterals are fiberglass or molded-extruded ABS."

He says the machine his department has invented fits in an 8-inch line and is shaped like a coffee can. It rotates at high speeds and cuts through protruding laterals using a bimetal blade on the leading edge to snip off the ends of laterals protruding into the mainline. The end drops into the sewer line and can be removed with other debris as the line is flushed out.

A third invention is an idea Carlson came up with himself. It's a quick-release mechanism that avoids both the hassle and the safety hazard of unthreading tools on the end of rods and threading on new tools. "New guys always find it difficult to get the angle just right when rethreading," he points out.



Operations Manager Kent Carlson (center, in black) poses with his crew at one of Los Angeles' Collections Division yards in the San Fernando Valley.

«Jeffery Petillo (left) and Mathew Diaz of the Los Angeles Collections Division use a Champion mechanical rodding truck to manually clean sewer lines of roots and debris. »The crews of the Los Angeles Collections Division Reseda yard keep a bag full of interesting debris found while cleaning sewer lines throughout the city.



He says the quick connect takes less than five minutes to change a tool. “We’ve had no injuries with the connection tool. It’s been a godsend for safety.”

The made-in-LA pride is strong, but that doesn’t prevent the Collections Division from pursuing and adopting other sewer line innovations.

“We’re always looking around, trying to use as much new technology as is out there to clean and maintain our sewer lines. We’re always looking forward to innovations and enlarging the scope of knowledge of our staff.”

One breakthrough involves the use of smartphone technology to plot latitude and longitude points for missing manholes, or manholes that are buried in backyards or other hard-to-find places. “Through an app on our phones, we can get the longitude-latitude footprint, and do it without surveying,” Carlson says. “It’s pretty neat.”

In addition, each truck used by collections system crews is equipped with a laptop computer — much like you would find in modern-day police and emergency vehicles. Work orders are sent digitally to crews in the field, eliminating paperwork.

Training

To staff its crews with knowledgeable, effective people, the LA Collections Division pays special attention to training newcomers to the staff.

“We require Class B licensed operators at a minimum,” Carlson says. “We move new employees around to the different areas, let them get experience on all the different types of equipment we have — cleaners, hydros, rodders.”

“Everybody is cross-trained. Like baseball, it’s good to have a deep bench.”

Carlson, an ex-Navy submarine machinist who cut his teeth on trucks and pumping stations, likes the sewer business, even though it’s out of sight and out of mind to most.

“There’s nothing like it,” he says. “We’re not in the limelight like police or fire or water and power. Yet we try to respond to all calls within 30 minutes. The taxpayers expect a high level of service, and we do the best we can with what we have.”

“We’re unsung heroes for millions of people,” he adds. “We’re sewer heads.” ♦



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