

I&I

INFLOW & INFILTRATION SOLUTIONS AND EQUIPMENT

Supplement to:
MUNICIPAL
**SEWER
&
WATER**

A BETTER FIX:
Taking
Turbulence
in Stride
Page 36

Comprehensive Planning

Grand Prairie takes
a systematic approach
to I&I and SSOs

Page 10



BEST PRACTICES
Page 32

Comprehensive Planning

Grand Prairie's big-picture approach solves many problems, including inflow and infiltration

STORY Jared Raney | PHOTOS Olivia Ogren-Hrejsa

Suddenly, you find that flow is increasing drastically — the system is careening toward an overflow, and if inflow and infiltration is your problem, finding the source is no simple matter.

If your utility is like Grand Prairie, Texas, the solution to limiting I&I may not be finding that source at all — sometimes the best way to fix I&I is not to focus on it, but instead to take an all-encompassing systemic approach.

Grand Prairie struggled with a yearly average 65 sanitary sewer overflows throughout their 700-mile wastewater collections system in 2006.

Concerned by such a high number of overflows, the city embarked on a comprehensive assessment of the system, with an efficient inspection and monitoring approach using some innovative tools.

A combination of flow monitoring via SmartCover manhole monitoring and acoustic assessment using an InfoSense SL-RAT allow Grand Prairie to prioritize their replacement projects into a comprehensive master plan. Doing so limits emergency repairs and keeps them on the path to reducing I&I and eliminating overflows.

Today, the utility is down to single-digit overflows: eight per year for the last three years, and only three so far in 2018.

The cherry on top is that there have also been only three I&I-related events since 2012, compared to around five per year when the master plan started.

OLD AND NEW

Situated in the so-called Metroplex area between Dallas and Fort Worth, Grand Prairie is ripe for new residential development. On the other hand, it is also an old community with a lot of aging infrastructure.

Development sites often contribute inflow to the system through accidentals: a clean-out uncapped here, a loose manhole lid there.

Sites like this exemplify the importance of an ongoing monitoring program, which Grand Prairie has gone to great lengths to develop. Some of their greatest assets in this fight are monitoring and assessment solutions from SmartCover Systems and InfoSense.





Sewer repair and replacement projects in Grand Prairie (Texas) are prioritized in part by flow monitoring assessment using the SmartCover system. The green reflective box on top of the tilt cover hides the systems' antenna. Alerts are delivered to specified email addresses.



The management team at Grand Prairie Department of Environmental Quality includes, from left, Jim Siddall, water operations manager; Barry Walsh, utility operations superintendent; and David Clark, utilities projects coordinator.





GRAND PRAIRIE (TEXAS) DEPARTMENT OF ENVIRONMENTAL QUALITY

INFRASTRUCTURE:

700-mile collections system

PROJECT:

Comprehensive wastewater
system assessment

RESULTS:

Only three inflow and
infiltration-related events
since 2012

David Clark checks a
manhole after receiving an
alert from the SmartCover
manhole monitoring system.

As a result of this practice, utility workers have gone from cleaning a line every 30 days to an average of about every 120 days.

“We can spread the crews out a little more, and we wash the basins more on an as-needed basis, rather than on a just-in-case basis,” Siddall says.

The InfoSense SL-RAT is also a valuable asset in this regard.

“We put that down in the manhole, and it transmits an acoustic signal to the next manhole. Depending on the strength of that acoustic signal, it tells us if there are any obstructions or high flows in there,” Siddall says.

Using the SL-RAT, they score each line on a scale of 1 to 10, with 10 being completely clear. This saves on inspection costs, as using the SL-RAT takes much less time than a full video inspection.

“We’re doing that to get a snapshot of the condition of the lines,” Siddall says. “It helps us detect overflow points that we’ve had problems with in the past, but additionally, we use them for lines that we are washing on a periodic basis, and it has lessened the number of times we have to go out to those lines.”

LESSONS FROM THE LAKE

In 2015, during heavy rains, a utility supervisor noticed high flow through one of the lift stations.

They thought that it could be due to a nearby housing development. Upon investigation, they found some inflow, but it didn’t account for the volume passing through the lift station.

“What we found was there was a low depression, and our manhole was down in there,” Siddall says. “The force of the initial inflow had forced the manhole lid off, and now that thing was underwater because the lake was

The Grand Prairie crew includes, from left, Emilo Davila, utilities main worker; Rene Luna, utility crew leader; Barry Walsh, utility operations superintendent; Jim Siddall, water operations manager; and David Clark, utilities projects coordinator.

SmartCover provides a number of products for real-time condition assessment of manholes. Most of the systems tie into existing manholes and can be retrofitted for a number of purposes.

“We put them in areas where we know that we have to do periodic washing of the basins to make sure we don’t have any overflows there,” says Jim Siddall, water operations manager. “Instead of sending a crew out every 30 days to wash this particular line segment, we have a SmartCover on there and whenever it indicates that the flow in that manhole has reached a predetermined level, then we’ll send a crew out and wash it.”





“Our lift station was draining the lake. I hesitate to think of how many millions of gallons. That was our biggest challenge right there.”

Jim Siddall

coming underneath the road through a culvert into that depression area.”

The crew had to build a cofferdam separating the depression and manhole from the lake overflow and pump out the water covering the manhole.

“Our lift station was drain-

ing the lake. I hesitate to think of how many millions of gallons,” Siddall says. “That was our biggest challenge right there.”

It’s incidents like this that prove the value of flow monitoring.

“It has given us warnings on several occasions. On stormy nights, we’ll get several calls on SmartCovers — we have about 50 of them now — and they’re located all over town. Rather than having crews sitting here waiting for the overflow, we’ll get an indication.

“We can mitigate and have the crews ready to standby for pumping, so it doesn’t get outside of the manhole,” Siddall says. “I’d say it has saved us a lot of time and money over the years.”

There are two important aspects to the flow monitoring: data collection to assess pipe condition over time, and ongoing observation to identify spikes in flow that may indicate an impending overflow.

“It gives real-time data. They instantly tell us after a rain event how much calculated flow we got, and that has saved us a bunch of money also because those flow studies are usually pretty expensive,” Siddall says. “That has helped us make decisions on which lines we want to replace.”

MAKING THE PLAN

“Our plan was to get an assessment of the entire system, to determine what is causing these overflows, and what we could do to mechanically and operationally fix those,” Siddall says.

The current master plan was created in 2016 after the original from 2006 was completed.

“Replacement of several lines, which included just ordinary replacement due to type of material, clay pipe and that type of thing, and to increase capacity in certain areas,” Siddall says. “In that older area of town, we’re having problems with the age of the lines and the condition; almost every year we’re replacing lines down there.”

Because there is so much new development in the area, many of the older sections of town with aging lines had to be upsized anyway due to nearby housing projects, equaling a double-whammy for the city.

Some aspects of the plan, such as the flow monitoring, don’t address overflows or I&I directly. Instead, they are aimed at increasing operational efficiency to allow more resources for capital improvement and emergency replacements.

David Clark looks over components of a SmartCover monitoring system.

“I would say that at least 80 percent of the I&I problems are coming from the private side. You have to imagine that the services on the private side are just about the same age, and we’ve found some of the old Orangeburg pipe down in that area. I’d say most of our I&I is coming from the private side.”

The utility relies on building inspectors to ensure that new developments aren’t contributing I&I, and uses mainly smoke testing to identify existing illegal tie-ins like roof drains and French drains.

“Some customers have actually dug around their clean-out next to the house and then pulled the clean-out off to drain their yards,” Siddall says. “That’s just getting out there and surveying the area, and doing an assessment of each neighborhood, and that’s just a long and continuous process.”



Jasmine Alvarez, utility dispatcher, monitors the SmartCover system and alerts a supervisor if an alarm is sent.

Now that they have a firm grasp of what’s going on in the system, Grand Prairie is focused on increasing operational efficiencies day to day with flow monitoring, then channeling that extra time and money toward keeping their replacement schedule on track.

“Our plan is to continue to keep our lines clean and clear and in good mechanical shape, so that we can mitigate any type of overflows and mitigate the amount of money that we’re spending on controlling those overflows.” **I&I**

Featured products from:

InfoSense, Inc.

877-747-3245 | www.infosense.com

SmartCover Systems

760-291-1980 | www.smartcoversystems.com | See back cover