Sonic sewer RATs are saving local cities like Ivins both water and money

Written by Chris Reed October 7, 2021

IVINS — When it came to cleaning the sewers in Ivins, the city's public works department was pouring money down the drain.

There is nothing unusual about that fact. Most cities have to clean their sewers by flushing water through the entire system just to clean a few areas.

"Just to prevent one blockage, we were cleaning the whole system," Ivins Public Works director Chuck Gillette said.

However, Ivins and three other Southern Utah cities are making a dirty job more efficient, less wasteful and less costly with a new technology utilizing sound waves.

Undated photo of the SL-RAT equipment used to detect sewer blockages using sound waves | Photo courtesy City of Ivins Public Works, St. George News

The equipment, called the Sewer Line Rapid Assessment Tool – or SL-RAT – is manufactured by InfoSense Inc. and utilizes transmission and receiving devices shaped like yellow rectangles that go over manholes. Spaced out over a segment of pipe, the devices use sound waves to determine if and how much a pipe is blocked.

Sewer blockages have been becoming more costly to cities with the advent of "flushable" wipes that Gillette says aren't really that flushable, as well as fat oils and grease that he calls his "nemeses."

Until 2020, to deal with blockages in maybe 5% of its sewers, Ivins would flush out all 1,226 pipes – approximately 50 miles – with a high-pressure stream of water using 6,000 gallons of water per day. On top of that, the city paid for 1,100 labor hours.

Gillette said that is standard operating procedure.

Ivins Public Works director Chuck Gillette speaks to the Ivins City Council during their May 20, 2021, meeting at Ivins City Hall, Ivins, Utah | Photo by Chris Reed, St. George News

"You're cleaning every pipe. There's a rod shoved up the pipe and the tip of the rod has jets that shoot backwards," hesaid, adding that problems can occur if a sewer connection to a home wasn't installed correctly. Think of a water bottle that is filled to overflowing.

"Someone would say, 'Hey, we have bubbles coming up the toilet. What's going on?'"

But last year, Ivins, Santa Clara and the Ash Creek Special Service District, which combines Hurricane and LaVerkin, participated in a pilot program using the SL-RAT system, and instead of needing weeks and hundreds of man hours to locate a blockage in a sewer line, just a few days and 320 labor hours were used.

In Ivins, instead of cleaning out every pipe – even the pipes that were already clear – it was found that just 57 pipes out of the 1,226 actually needed cleaning. Thousands of gallons of water were saved.

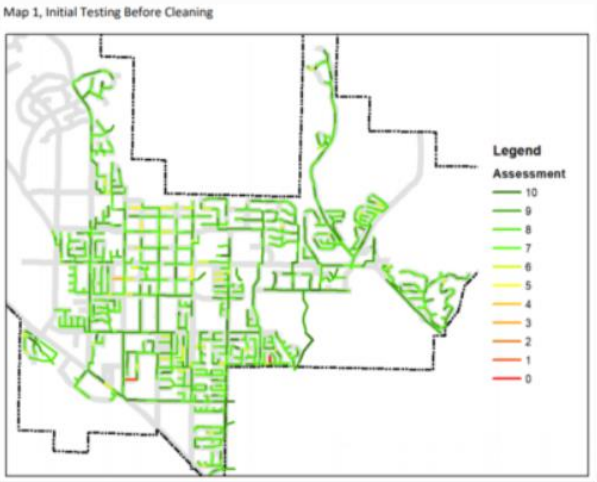
Jon Borden, president of RH Borden, which supplies the SL-RATs to Ivins and the other local cities, liked the experience to doing the dishes after a meal.

"Imagine if you had dinner," he said, "and instead of just cleaning the plates you used for dinner, you cleaned all your plates."

Borden said the only waste product of the SL-RAT process is the sound, which is indeed loud.

"But it's less than the sound of a cleaning truck, and there is zero water usage."

Regarding the trucks, Ivins and Santa Clara share two sewer vacuum trucks, which are still needed to do the ultimate clean-up of pipes that are blocked. However, the trucks will now be used much less, which Gillette said has the added savings of vehicle maintenance and having to purchase more trucks. A new vacuum truck can cost a city up to $400,000 according to the prices on commercial truck websites.



April 2020 map shows the complete sewer system in Ivins, Utah, with blockages color-coded from green for "clear" to red for "severe blockage" | Photo courtesy City of Ivins Public Works, St. George News | **Click to enlarge**

Another savings is in time. Gillette said he was able to have a team of three people analyze and clean the entire sewer system in two to three weeks. Under the old system of filling all the pipes with thousands of gallons of water, Gillette estimates that same amount of time would get him through about 10% of the entire system.

Borden said bigger cities have to break the process into chunks of three to five years.

"That means you might have a problem that you might not get to for five years," Borden said. "This (SL-RAT) allows you to look at the whole system every year."

The acoustic system was developed in 2008 after a professor at the University of North Carolina, Charlotte, was tasked by the city to come up with a way to fix an ailing sewage system.

Undated video illustration shows how the SL-RAT system works | Photo courtesy of RH Borden, St. George News

When Gillette was offered an opportunity to test out the new technology, he said it was obvious that, if it would work as promised, it was "almost a no-brainer."

"This is the future. Eventually everyone will do it this way," he said. "I just feel like we saw a technology that might work, and it did."

But Gillette added that all the technology still relies on a public works staff that does a thankless job that doesn't often get noticed unless something goes wrong.

"They do some nasty stuff. They do a lot of work for the city," Gillette said. "My old boss use to call it 'the silent services.' People don't care about what they're doing and don't want to care."