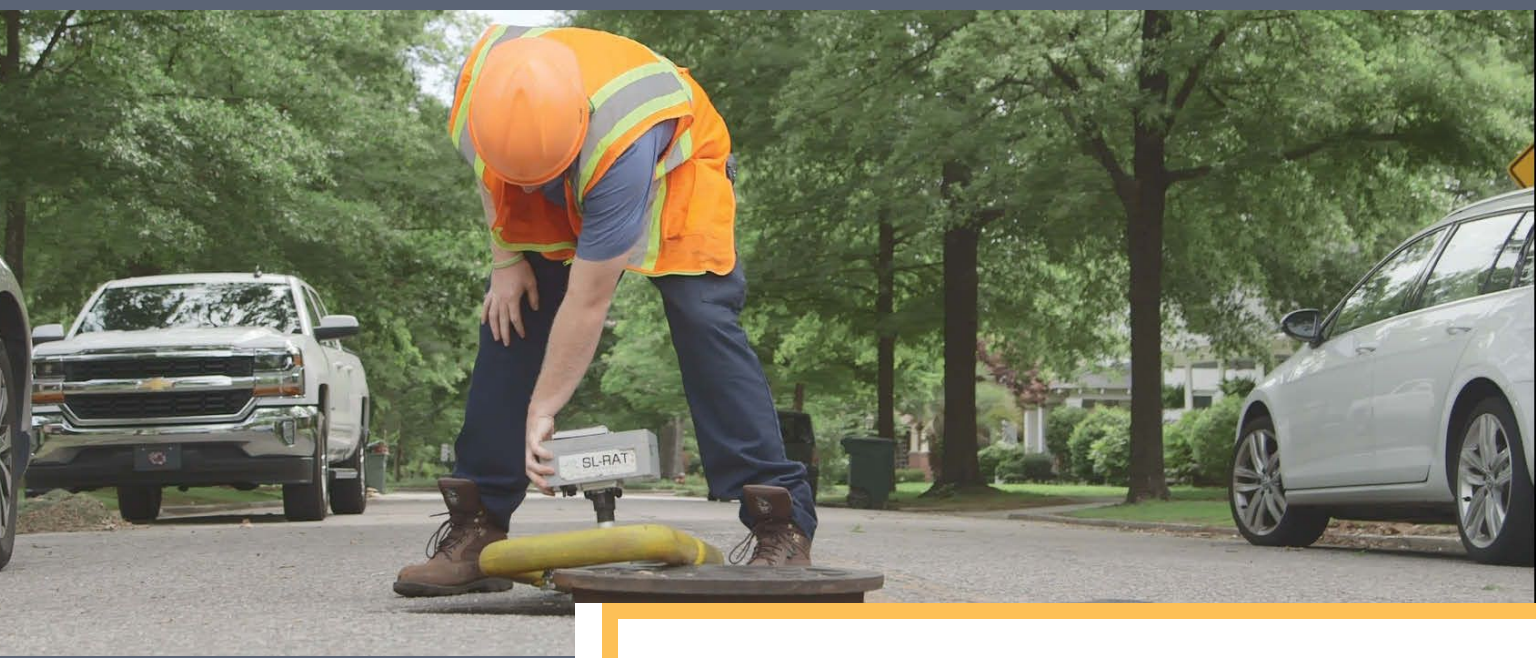
REDUCING RISK:

How Oklahoma's Primary Municipal Insurer Is Helping Utilities Prevent SSOs

By Diane Ryu



Routinely inspecting and cleaning sewer lines is a vital part of maintaining wastewater collection systems. Planning a proactive maintenance strategy to mitigate risks is tricky, as wastewater utilities face aging infrastructure, population growth, budget pressures, reduced staffing and other challenges. However, determining on a daily basis how and where to prioritize expensive cleaning and CCTV resources to mitigate these challenges is an age-old problem.

A reactive cleaning strategy leads to higher risk, more overflows, and more basement backups. Alternatively, because only 10 to 30 percent of pipes need immediate attention from cleaning resources in the average utility, cleaning resources are wasted on "cleaning clean pipe" when using time-based or basin-by-basin deployment strategies. Finding where the problem areas and potential sanitary sewer overflows (SSOs) are without wasting resources on non-productive cleaning costs is a challenge wastewater O&M programs must address.

What Is Transmissive Acoustic Inspection Technology?

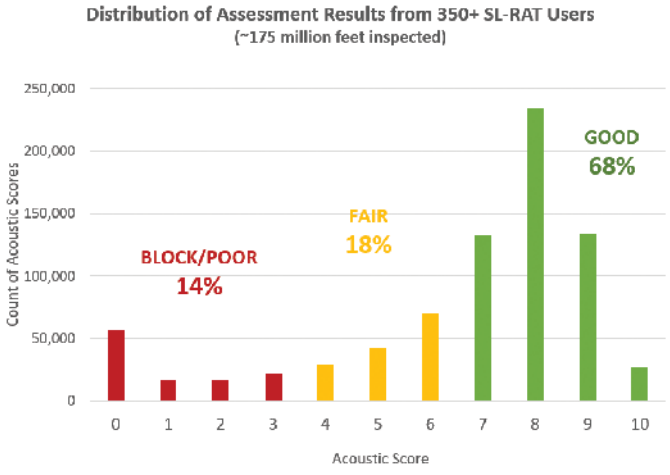
To address this resource allocation problem, acoustic inspection technology was designed to help wastewater utilities quickly screen their collection systems to identify areas with need for cleaning or further maintenance. The Sewer Line Rapid Assessment Tool, or SL-RAT, manufactured by InfoSense, Inc., was developed through a multiyear partnership between a major utility and academia. The SL-RAT uses transmissive acoustics – in other words, "yelling" and "listening" – to screen 6- to 12-in. gravity sewer lines for blockage conditions. Acoustic inspection technology has been gaining traction since 2012, assisting hundreds of utilities around the world with developing condition-based maintenance programs for their collection systems.

The SL-RAT provides a blockage assessment in a matter of minutes, giving actionable insights on where to best deploy cleaning and CCTV resources. The blockage assessment is given on a scale of zero to ten, where zero indicates a completely obstructed pipe, and a ten indicates an unobstructed pipe (0-3: POOR, 4-6: FAIR, 7-10: GOOD).

OMAG's SL-RAT Loan Program – Assisting Smaller Oklahoma Utilities

Oklahoma Municipal Assurance Group (OMAG), founded in 1977, is an interlocal co-operative insurance group serving over 500 Oklahoma cities and towns. One of OMAG's risk management priorities is to reduce the occurrence of sanitary sewer overflows in their member utilities, as these issues represent the most frequently filed liability claim against Oklahoma municipalities.

In January 2018, OMAG purchased an SL-RAT device, to see if the technology was an appropriate fit for helping their member municipalities prioritize cleaning assets and mitigate SSOs. To validate the technology, OMAG used the SL-RAT in 29 different Oklahoma wastewater utilities over a six-month period, operating at each location for a single day. "We had a camera behind the SL-RAT to ensure the tool was giving consistent results" describes Wil-



liam Sheppard, Risk Management Analyst for OMAG. After a successful pilot period, OMAG purchased two more SL-RAT units and initiated their SL-RAT loan program in July 2018. They subsequently purchased two more units in July 2019 to support the growing interest in the program from their utility clients.

Today, OMAG's acoustic inspection program is comprised of five SL-RAT devices. The units are loaned to member utilities at no charge for a period of two to four weeks. The loan period is dependent on the municipality's size and on the availability of the equipment. While the size and resources of the participating municipalities vary, approximately 75 percent serve populations of fewer than 5,000 people. For the smallest municipalities that have three or less public works employees, OMAG provides additional support in integrating acoustic inspections through their Small-Town Program.

For each participating utility, OMAG provides training on how to operate the devices, as well as how to upload and organize the acoustic inspection data through the corresponding software, the Sewer Line Data OrGanizer, or SL-DOG. During the loan period, OMAG encourages each municipality to inspect their entire system. "We recommend that they aim to inspect 10 to 15,000 lf of sewer line per operational day" says Sheppard. "We help our municipalities plan the SL-RAT operation, before the tool is ever deployed." Municipalities that successfully inspect their entire or a substantial percentage of their systems qualify for 1,200 lf of CCTV inspection of their lines at no cost to them.

OMAG Program Results: Inspecting 2 Million Ft in Oklahoma

Although the program was created only two years ago, OMAG's SL-RAT loan program has already helped 83 Oklahoma utilities acoustically inspect more than 2 million lf, or 400 miles, collectively. The inspection results show that from all miles inspected, ~40 percent of the lines scored a BLOCK or POOR acoustic score. "The acoustic inspections we've conducted so far have prioritized areas with suspected need, so we have a larger proportion of pipes with BLOCK or POOR assessments" says Sheppard. Typically, utilities expect that somewhere between 10 to 30 percent of pipes will require immediate action from cleaning resources, as data aggregated from 175 million ft of acoustic assessment data from 350 utilities demonstrates.

The acoustic inspection results give municipalities clarity on where to prioritize efforts and cleaning resources. In many cases, operators are conducting manhole inspections in conjunction with acoustic inspections, resulting in identifying additional sources of infiltration & inflow, as well as other issues such as missing manholes and rights-of-way that need attention.

"[The SL-RAT] exceeded our expectations" says Jay Neal, the Utility Line Maintenance Supervisor for the City of Durant in an interview with OMAG. "As with all newer technologies, it's easy to be reluctant to accept its usefulness. However, the SL-RAT proved up to the challenge. The biggest advantage the SL-RAT provides is to afford our department a proactive way to deal with sewer problems instead of putting us in a more reactive posture."

Additionally, OMAG assists municipalities with understanding and integrating their SL-RAT data through a cloud-based web portal called the SL-DOG. They've discovered that with the mapping and integration capabilities provided through this software, many municipalities are using the SL-RAT to get comprehensive maps of their assets. "The integration into Google Earth and the ability to export to Microsoft Excel for in depth analysis is worth the price of admission in and of itself" says Neal. "Furthermore, it provides an excellent form of accountability for the department and a quantifiable way of determining problem areas and justifying repairs."

OMAG is only getting started with helping Oklahoma municipalities listen to their collection system needs. They're aiming to help member cities inspect another 100 miles with acoustic technology by July 2020. By inspecting more, OMAG's member cities can get a clearer understanding of the health of their sewer systems and proactively manage their assets. According to City of Durant's Neal, "I would highly recommend that other municipalities take advantage of what the SL-RAT can provide in regard to their wastewater collection system."

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