

## A BETTER VIEW OF YOUR INFRASTRUCTURE

Digital side-scanning technology offers rapid condition assessment, enabling more informed decisions

By Chris Parker

Digital side-scanning is becoming more common as municipalities embrace new technologies that enable rapid assessment of pipelines and provide high-quality data to efficiently quantify repair and replacement needs.

There is somewhere between 700,000 and 800,000 miles of public sewer running below homes, businesses, parks and playgrounds across the U.S. — much of it largely brittle if not broken.

Improving that infrastructure first requires thorough inspection and condition assessment to properly catalog, document, quantify and prioritize the repair or replacement of each asset.

Considering the quantity of assets and how swiftly the pipeline infrastructure is deteriorating, it will be difficult to meet the inspection challenges most municipal entities are facing utilizing traditional CCTV inspection.

To meet the demand, municipalities may consider embracing new technologies that enable rapid assessment of pipelines while providing the highest quality data to efficiently quantify repair and replacement needs.

Digital side-scanning technology offers a solution for municipal entities to meet the ever-increasing challenges and demands of America's failing sanitary sewer and stormwater systems.

### NEW APPROACH

The American Society of Civil Engineers estimates the need for \$300 billion in the next 20 years to revitalize and rebuild America's wastewater infrastructure, with 75 percent slated toward the rebuilding and rehabbing of pipelines alone.

With less staff, limited resources, little or no federal funding, and the inability to turn back time, most municipalities face a harsh reality as to how to address these failing pipelines. An even harsher reality is that most municipalities lack the proper inspection equipment to perform thorough condition assessments of all of their pipeline assets within an appropriate amount of time.

Having an active pipeline inspection program with traditional CCTV equipment in some cases is no longer sufficient to meet the demands most municipalities face. Every dollar must be spent as wisely as possible.

By utilizing digital side-scanning technology, a thorough 360-degree visual assessment is accomplished in a fraction of the time it takes for a traditional CCTV inspection. The advantages of digital side-scanning inspection are quantifiable and enable the operations and engineering teams to work together collectively to rapidly perform condition assessments of an entire pipeline system, but most importantly, to collect high-quality, usable data to make appropriate repair and replacement calls to ensure defensible, efficient and wise spending.

### THOROUGH ASSESSMENT

While fixing pipes will correct overflows and other pipe-related issues, the difficulty in that process begins far before making the necessary repairs or replacement. With over 700,000 miles of public sewers in the U.S., these pipes must initially have a condition assessment performed via a visual inspection in order to determine whether they are in good standing, need of repair or complete replacement. This proves to be troublesome for most municipal utilities that are under-equipped to properly inspect the current state of their sanitary and stormwater systems.

From the smaller town of Framingham, Massachusetts, with 68,000 residents who were facing \$200 million for repairs, to the cautionary tale of Atlanta's \$2 billion overhaul of its system, the stories continue to repeat over and over again from communities across the U.S. having major sewer issues, with few reported on a national level. Sanitary sewer backups are not just an inconvenience, but also a major public health concern.

Having raw sewage in streets, yards, and sidewalks is not acceptable, yet not nearly enough is being done. Municipalities can avoid the majority of these situations by having an effective and efficient pipeline condition assessment program and utilizing the latest technologies available to rapidly inspect an entire city system.

Continuing with traditional pipeline inspection methods in today's climate will not allow utilities to get ahead of the problems at hand or to make informed decisions at a rapid rate to help avoid more sewer system problems.

While population density is a good indicator of areas with the most repair and replacement needs, every municipality, regardless of size, should have a thorough condition assessment program in place for their pipeline assets.

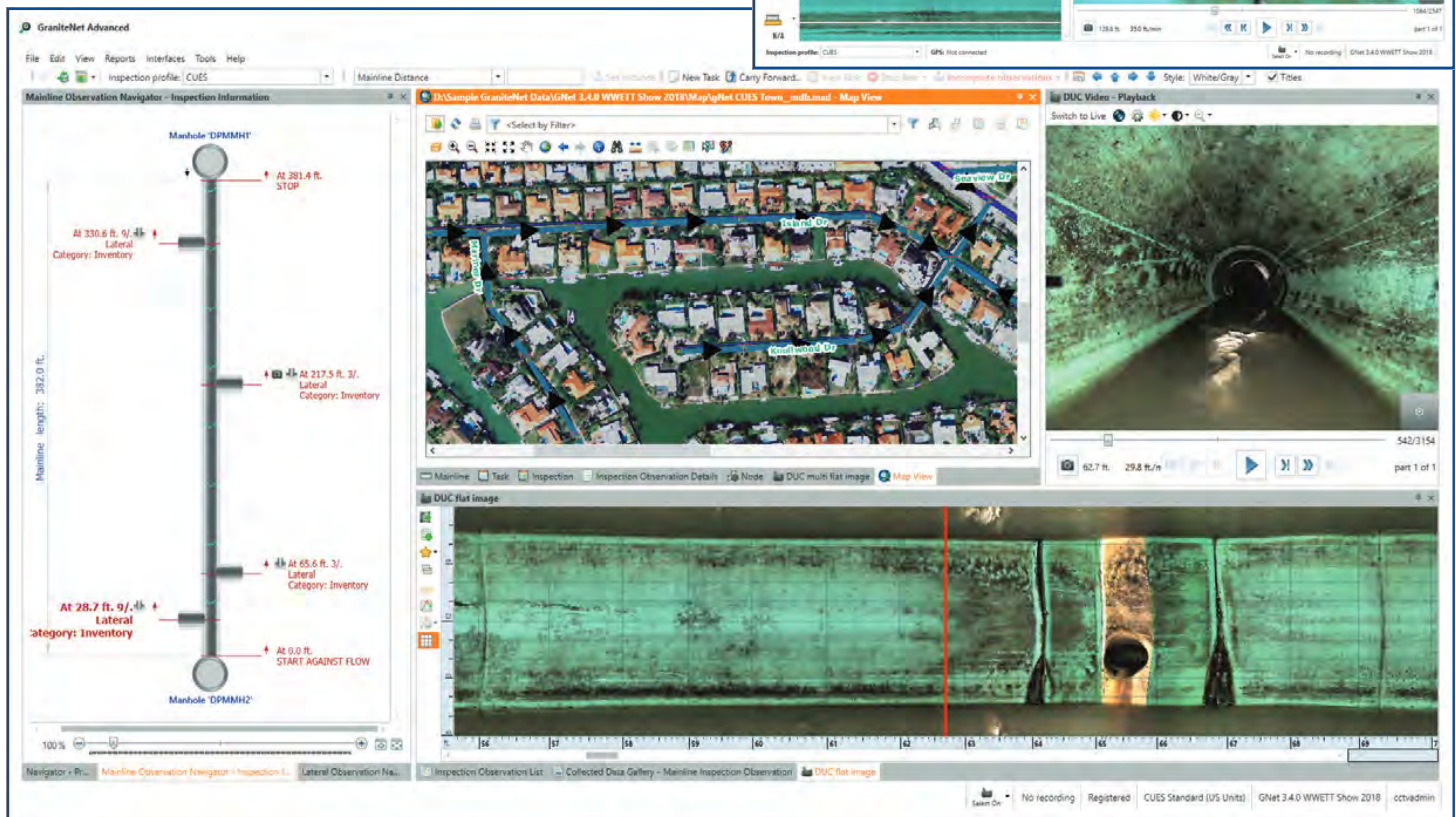
While analog pan-and-tilt camera technology has been the standard for pipeline assessment for over 20 years, this technology has never been known to save time or rapidly expedite the assessment process. Given the current state of the pipeline assets in this country, a more thorough and rapid approach was necessary to meet the true needs of municipal entities and the challenges they face.

Any municipality that does not have an active inspection program is doing a disservice to the residents and the city. They are essentially spending capital funds blindly for repairs and replacements on pipes that may never have been assessed or that have not been assessed for a long time.

Serious pipeline problems will continue to develop unnoticed due to the lack of a pipeline assessment program. These problems include:

- Infiltration into the system causing great costs at the processing plant not being addressed.
- Continued hydrogen sulfide pipe wall corrosion not being addressed.
- Poor construction and workmanship not being exposed.
- Protruding lateral services causing reduced line capacity and contributing to blockages.
- Excessive settling of solids in pipelines, which can lead to obstruction or blockages.
- Excessive buildup of grease, slime and other viscous materials leading to blockages.

Side-scanning camera systems work by capturing several images per second, which are then stitched together, producing three deliverables: high-resolution video, a flat unfolded view of the pipe from manhole to manhole (multiflat view), and an expanded flat unfolded view of the pipe for close-up views and measurements of defects.



All of the above detrimental factors could be mitigated along with a directly related substantial reduction of capital expenditures via a regularly scheduled pipeline condition assessment program.

Most cities lack any level of visual data of their pipelines and have no data for comparison purposes when additional assessments are performed. This lack of data leads to further indecision or wrong decisions being made for pipeline repairs.

### SOLUTION TO THE PROBLEM

Early adopters of digital side-scanning technology have been more than pleased with the results. One of those early adopters, McKim & Creed, an engineering firm with numerous locations throughout the U.S., has been using the technology since May 2014.

Greg Anderson, vice president for McKim & Creed, feels that their pipe-

By removing the need to pan and tilt while traversing the structure, digital side-scanning saves time and increases production. The camera captures the entire 360 degrees of the pipe.

line condition assessment programs for various entities has doubled in production over traditional analog surveys.

Anderson says without a doubt that the quality of the digital side-scanning data enables his end clients to make better informed decisions for repair and replacement over that of traditional CCTV surveys. "The quality of the video stream is substantially more defined, and the evaluation process much easier to complete," he says.

Digital side-scanning inspection technology enables rapid assessment of the pipeline structure with the highest quality scan of the pipe possible without the need to stop during inspection. It's important to understand the differences between the previous technologies available and that of the newest technology, digital side-scanning cameras.

Side-scanning camera systems are designed to provide the highest quality video/photos for review along with significantly increasing footage while augmenting the quality of data available for condition assessment.

The technology works by capturing several images per second, which are then stitched together, producing three deliverables: high-resolution video that is a permanent and accurate record with the ability to virtually pan, tilt, and zoom to any area of interest; a flat unfolded view of the pipe from manhole to manhole (multiflat view), and an expanded flat unfolded view of the pipe for close-up views of defects and to perform measurements.

The flat view provides the ability to quickly inspect and review thousands of feet of pipe in a matter of hours instead of days, allowing you to make the best use of the one resource that is not replaceable ... time.

The digital side-scanning method saves you that most valuable resource. When compared to traditional analog camera surveys, the time savings are significant.

The positive results of digital side-scanning technology are echoed from numerous municipalities from across the U.S. that embraced the technology



consent decree requirements and Environmental Protection Agency expectations, enabling the end user to do more with less. Additionally, the system improves accuracy and consistency, even though inspections are completed within a compressed time frame.

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#### CHALLENGES AHEAD

There are vast challenges ahead pertaining to wastewater infrastructure maintenance and rehabilitation. It is essential to adapt new condition assessment processes and systems such as digital side-scanning in order to meet these requirements. Traditional pipeline inspection has worked well for years, but most municipalities

are faced with a new set of objectives and problems.

Not every new technology that enters the market is worth adapting. It is important to perform due diligence to verify that the new wastewater inspection systems now available will meet your long-term requirements, be cost-effective, and produce a positive return on investment.

Digital side-scanning technology will provide a comprehensive, 360-degree view of the pipeline while allowing rapid condition assessment to make intelligent, informed decisions on where to spend repair and replacement dollars. Pipeline condition assessment and maintaining a fleet of inspection vehicles is expensive. However, the expenses of not having an inspection program that utilizes the best available technologies on the market can be even greater.

Digital side-scanning technology can help you identify costly infiltration and thus save funds related to pumping, treatment and disposal. It can also help rapidly identify problem areas and major pipeline issues, which allows you to react before there is a backup and possible fines due to an overflow.

By maintaining an inspection program that includes digital side-scanning technology, there is less risk of regulatory action and an enhanced reputation for proper operation and management of the public sewer system.

Ensure you are investing your dollars wisely in technologies and programs that can provide benefits on several levels to offer the best possible return on investment. Digital side-scanning technology is proven and reliable, and it will surely accelerate your municipality in the direction of success.

#### ABOUT THE AUTHOR

Chris Parker is a regional sales manager for CUES. 

in its early stages and have significantly improved their position for the future while making better informed decisions on repair and replacement calls, enabling wise and efficient spending of public funds.

The Metropolitan St. Louis Sewer District was one of the early pioneers in embracing the technology, and the results are clear. A footage report from September 2013 provided by the district showcases the type of production increases they are experiencing with the digital side-scanning systems over their remaining traditional CCTV systems.

The two digital side-scanning trucks outperformed the traditional CCTV systems by 4,023 feet. Essentially, the digital side-scanning trucks were three times more productive in the same working day than that of their traditional counterparts.

Beyond the potential increase in data collection, what's more important is the increase of quality sustained with the digital side-scanning technology over traditional systems.

The digital side-scanning technology advancement most notably enables users to view the interior of a pipe like never before, not missing a single detail.

By removing the need to pan and tilt while traversing the structure, the time savings and production instantly increase. The camera captures the entire 360 degrees of the pipe, which means fewer errors and elimination of repeat inspections and high-resolution images to ensure the condition assessment of the pipe will be accurate and properly coded. That results in the correct rehabilitation or repair call being scheduled.

Digital side-scanning technology is a comprehensive data collection platform that offers high-quality video inspections at a rapid rate that meets accelerated time frames for inspections, especially in regards to fulfilling