

Phased Assessment Strategy for Sewers

A plan for understanding sewer system condition quicker, with fewer resources.



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Are deteriorating infrastructure and dwindling budgets

forcing you to reevaluate your sewer inspection program? If so, it can be hard to know where to start, especially with limited bandwidth and resources. Here you'll learn about a new workflow; one that will save your department money, help optimize resource utilization, and allow your inspection crews to focus their attention on the sewer assets that need it most.

Sewer inspection is critical to the wellbeing of our wastewater infrastructure, our communities and the environment. Benefits of a well-rounded inspection program include (EPA, April 2010):

- Reduced sources of infiltration and inflow (I/I).
- Avoided emergency repair costs.
- Avoided costs of extended service disruptions due to a catastrophic failure.
- Avoided restoration costs due to environmental and property damage from a catastrophic failure.
- Avoided public health costs (i.e., injury, death, disease transmission) from catastrophic failure.
- Improved planning and prioritization of rehabilitation and replacement projects due to condition assessment information and improved estimates of service life.
- Avoided costs of premature pipe replacement and rehabilitation.
- Improved customer satisfaction and fewer complaints.
- Improved service reliability.

These benefits are the goal of every sewer department, but given today's budgets, a CCTV-only inspection approach is often too cumbersome to yield timely, actionable, system-wide data. A new approach is needed—one that maintains the goal of comprehensive assessment, but which increases productivity and reduces costs.

The Most Exhaustive Approach is Seldom the Most Practical

CCTV crawlers gather the most detailed information from a pipe, allowing an operator to pan, tilt and zoom in on pipe features. They are the most commonly used inspection tool in our industry, and the most detailed method for inspecting the internal condition of a sewer. However, they are also the most time-consuming and labor-intensive to operate.

While CCTV crawler inspection is an essential tool in any condition assessment program, many lines don't need the level of scrutiny a crawler offers. Rapid assessment tools like zoom cameras and video nozzles are ideal front-line tools for screening out such lines. If municipalities incorporate these tools into a three-phase approach to inspection, they can save significant time and money, and maintain more updated information about pipe condition.

Phased Assessment Strategy for Sewers (PASS): An Improved Workflow for Inspection.

If you are trying to meet the increasing demands for infrastructure inspection with the same old workflows and technology, you're fighting a losing battle. The evolving challenges of sewer inspection require adapting new technologies and methodologies to gain greater efficiencies and better data. Doing so can allow inspectors to prioritize system-wide which lines need the most attention, and to shorten the interval it takes to perform a complete system assessment.

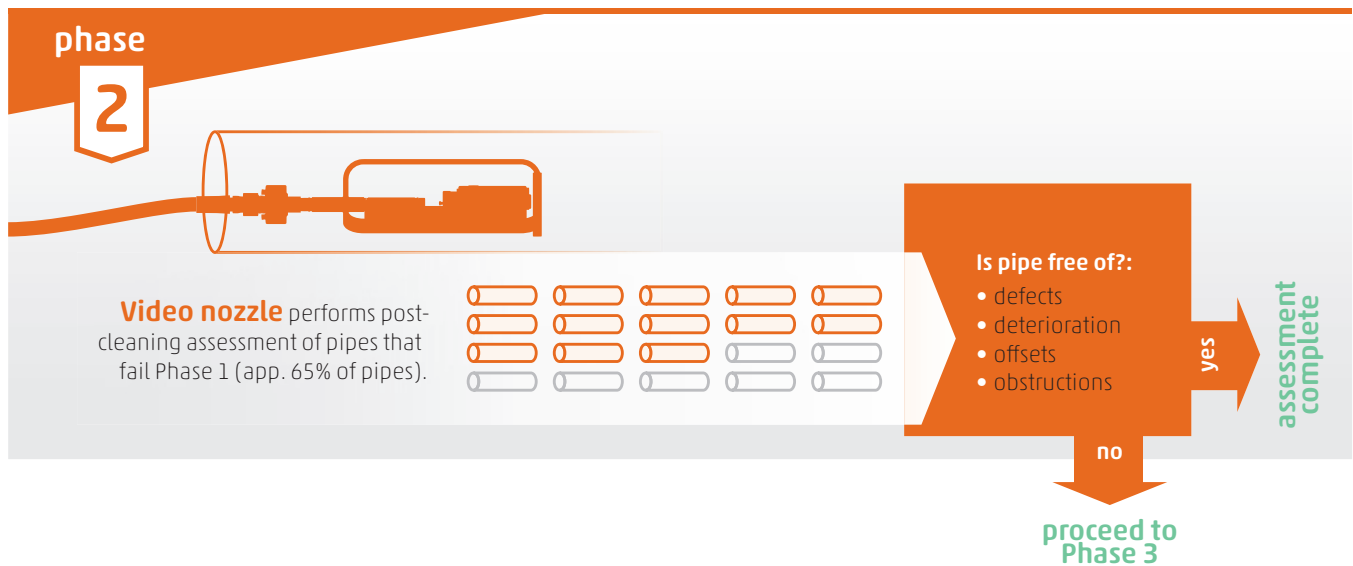


Phase 1: Initial Survey with a Zoom Camera

Zoom survey cameras employ a video camera mounted on a telescopic pole to view deep within pipes from an adjacent manhole, as well as inspect the manhole itself. Zoom cameras don't replace conventional CCTV inspection, but rather identify exactly which pipes need further investigation. Sewer lines don't need to be cleaned before a zoom survey, and therefore can be assessed quickly by a single operator.

Municipalities that use zoom survey technology as a part of their sewer inspection strategy have realized speed and costs benefits over CCTV-only inspection. Also, zoom cameras are safer and less disruptive because they reduce the exposure of traffic and work crews to each other.

During Phase 1, you survey all your sewer pipes with a zoom camera. When defects are observed or the view is obstructed in a particular pipe, flag it for the next inspection phase. Otherwise, mark it as PASS.

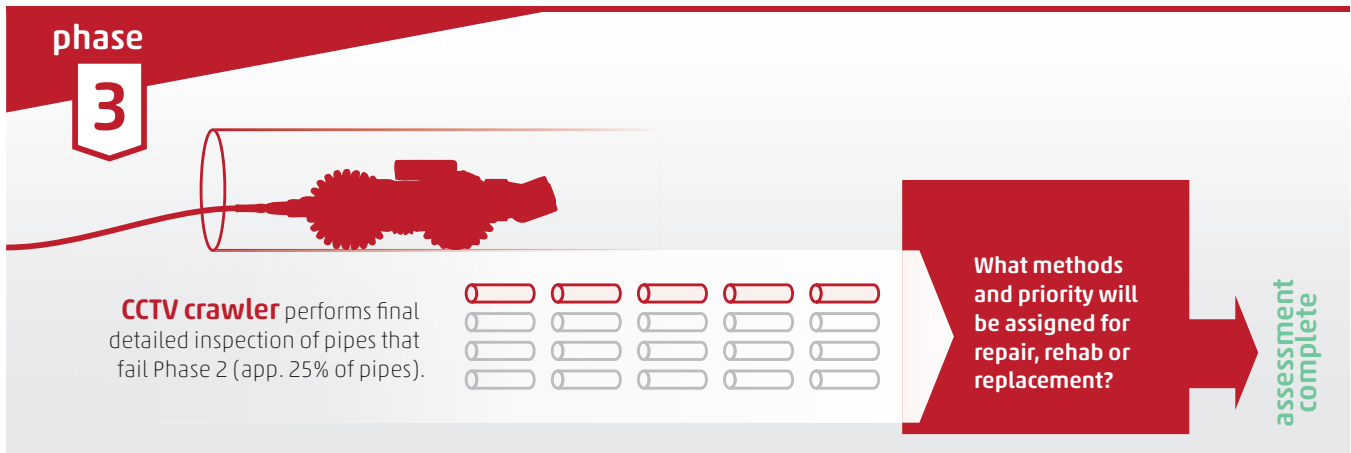


Phase 2: Post-Cleaning Assessment with a Video Nozzle

Cleaning is an important part of pipe maintenance, and an essential prerequisite for CCTV inspection. Any line that doesn't pass Phase 1 needs to be cleaned to remove the grease and debris that interfere with a CCTV crawler. In many cases these obstructions are the only problem with the pipe, and a quick post-cleaning video nozzle assessment can confirm that no additional crawler CCTV is needed.

A video nozzle is a water-propelled HD camera that threads on the jetter hose, allowing rapid collection of detailed visual information about a pipe's condition post-cleaning.

On average, only 65% of pipes surveyed with a zoom camera will require additional attention, which starts with cleaning. Once the cleaning crew finishes cleaning the line they can quickly assess if any defects are present in the sewer lines and make a recommendation as to whether the pipe segment should be thoroughly inspected using a CCTV Crawler, or marked as PASS.



Phase 3: Detailed Inspection with a CCTV Crawler

For lines where a Phase 2 video nozzle inspection reveals pipe defects, a final CCTV camera crawler inspection is warranted. Crawler inspections reveal the highest level of detail, which is needed to prioritize and plan for maintenance activities like lining, grouting and open-trench replacement.

CCTV inspections are essential for identifying and characterizing breaks, root intrusions, leaking water, and other kinds of deterioration. No inspection program can operate without a CCTV Crawler because of its unique ability to fully understand the problems inside a sewer pipe.

Using the PASS method, zoom camera and video nozzle surveys will have already pinpointed which pipes will benefit from a CCTV inspection. These pipes now can be thoroughly inspected and given the attention they need. Typically, only about 25% of pipes in a collection system need a detailed CCTV inspection. With an average cost of \$1.25/ft for CCTV crawler inspection, it is imperative to inspect pipes with this method only as required.

Cost and Productivity Benefits of the PASS Approach.

Counter-intuitively, multiple assessment phases actually reduce the time and expense of infrastructure assessment compared to a CCTV-only approach. Just how much money can an inspection crew save when it implements PASS?:

		full CCTV		PASS program	
		% pipes	cost	% pipes	cost
cost	zoom survey (Phase 3)	-	-	100%	\$0.15/ft
	video nozzle (Phase 3)	-	-	65%	\$0.56/ft
	crawler CCTV (Phase 3)	100%	\$1.25/ft	25%	\$1.25/ft
	average		\$1.25/ft		\$0.83/ft

save 34%

And how much productivity can that same inspection crew gain when it implements PASS?:

		full CCTV		PASS program	
		% pipes	productivity	% pipes	productivity
productivity	zoom survey (Phase 3)	-	-	100%	10,000 ft/day
	video nozzle (Phase 3)	-	-	65%	3200 ft/day
	crawler CCTV (Phase 3)	100%	2000 ft/day	25%	2000 ft/day
	average		2000 ft/day		2336 ft/day

gain 17%

PASS with Flying Colors

Let's face it... inspecting sewers is no easy job. Not only are sewer departments responsible for making sure underground pipelines are operating optimally, they must do so with diminishing resources. It's a challenging situation, but one that can be vastly improved with the PASS method. PASS reduces costs and improves the response time for inspection, all without compromising visibility on overall system condition. And once you channel assessment resources to the pipes that need them most, you're making the best possible impact on the infrastructure, the environment and the community you serve.

Sources

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