

# THE DANGERS HIDDEN BELOW

## DEVELOPING AN ACTION PLAN TO ADDRESS CROSS BORE SAFETY

By Kevin Vine

FOR MANY YEARS NOW, trenchless tunneling or no-dig technologies have been leveraged as an improved method for installing underground utilities, resulting in less damage to property, roadways and tree roots. Though much less disruptive, trenchless technologies do not allow for visual observation, which has introduced a new risk: on rare occasions, natural gas, communications and electricity installations have inadvertently intersected with sanitary or storm sewer lines during horizontal directional drilling (HDD) or pneumatic boring activities.

The intersection of underground utilities is known as a cross bore. Cross bores can remain harmless and undetected for years, causing little to no disruption. However, potential dangers arise when a sewer backs up and needs unblocked. For example, if the pipe is cleared using water-jetting or motorized equipment, it can damage the intersecting utility, which could result in a communications or electricity outage, or worse. On rare occasions, a natural gas line has been punctured, causing gas to leak through sewer laterals. Some cases have resulted in millions of dollars in property damage, serious injury, and even death.

In response, in 2011, the Technical Standards & Safety Authority (TSSA) mandated that all natural gas distributors incorporate an action plan to address cross bore risk. This kick started the inception of the Cross Bore Safety Program, which is now being implemented by utilities, municipalities and contractors across the United States as a means to avoid liability and improve public safety.

### LEGACY VS. NEW CONSTRUCTION

A comprehensive Cross Bore Safety Program accounts for both legacy and new construction. The legacy program is comprised of two distinct components. The first focuses on inspecting project sites of past trenchless installs to confirm the absence of cross bores. This normally consists of reviewing existing records and



as-builts and conducting a field investigation where required. Inspections can be prioritized based on risk factors, such as the sewer system depth, material type, installation type, etc. The second component focuses on managing immediate risk by encouraging homeowners and business owners to “Call Before You Clear.” This consists of outreach efforts that seek to educate the public on the importance of securing a Sewer Safety Inspection (SSI) prior to having their sewer pipes cleared.

The New Construction component refers to locating and mapping existing underground utility pipes to mitigate cross bore risk when installing new infrastructure. Once mapped, the information is provided to construction engineers who require the precise location of sewer laterals and other utility lines prior to installing new utility distribution lines. Sewer video inspections can also occur post-con-

A PUSH CAMERA IS USED FOR A SEWER SAFETY INSPECTION (SSI). THIS TECHNIQUE IS IDEAL WHEN ACCESS IS REQUIRED TO THE LATERAL THROUGH A RESIDENTIAL CLEAN-OUT, PARTICULARLY IF THE LATERAL IS BLOCKED FROM THE MAIN LINE.

THE CAMERA MAXIMIZES VISIBILITY IN CONSTRICTED AREAS AND MAKES IT POSSIBLE TO MANEUVER AROUND OBSTRUCTIONS.

struction to verify that no cross bores were introduced as a result of the project. The resulting video and data provides powerful evidence against any potential future liability.

Ontario-based Union Gas Ltd. was one of the first large utilities to implement a comprehensive Cross Bore Safety Program in the province. Guided by best practices, the utility developed a legacy and new construction program that sets an example for other organizations to follow.

“After a number of significant incidents had occurred in the U.S., we recognized that a very real threat might exist north of the border, as well,” said Tyler Boyes, senior coordinator, Utility Cross Bore Safety Program, Union Gas. “Our program is founded on the concept of safety above all else. It’s about making sure the public, plumbing and draining contractors and our employees are aware of the risks and what needs to be done to keep everyone safe.”

When the program was first implemented, Union Gas reviewed its construction processes and began to incorporate specific safety procedures for working in proximity to sewer lines. The legacy component has focused on homeowner safety through public outreach and education that has included informational seminars, social media awareness campaigns, direct mailers

and resources made available through the organization's website.

"When a homeowner reaches out to Ontario One Call to report a blocked sewer, an immediate request is sent to one of our service providers to complete a Sewer Safety Inspection (SSI)," explained Boyes. "The service is offered at no cost to the homeowner, plumber or municipality. Furthermore, if a sewer has been damaged by a gas line cross bore, Union Gas will pay for the repair."

## BUILDING A SUCCESSFUL PROGRAM

Cross Bore Safety Programs and Inspections can be complex, with many moving parts. As such, a long lead time and careful planning is required to effectively roll out the initiative. A well thought out program will involve a reputable and experienced third-party utility locate contractor with advanced sewer camera experience, an investment in reliable technology, secure record keeping, data analysis, and a communication strategy to facilitate information sharing among stakeholders. Here are a few things to keep in mind to ensure a successful program:

**Partner with an experienced, reputable utility locate contractor:** To truly minimize risk, it is essential that inspections be carried out by a contractor that is capable of completing both utility locating activities, as well as CCTV sewer inspections to safely produce accurate results. Above all else, ensure that the selected contractor follows a robust Health, Safety & Environmental (HS&E) Management System that is regularly updated and implemented by an active Joint, Health & Safety Committee (JH&S).

A firm commitment to Quality Control is also a must. A Quality Management System (QMS) should underpin every process, from the initial project site visit through to submitting the final deliverable. When assessing a contractor, ask for a copy of their QMS. Make sure that a competency assessment program is in place and that field technicians have experience successfully completing similar projects.

Another important contractor attribute is having the geographic coverage to provide fast response times. To encourage homeowners and plumbing contractors to arrange for an inspection, requests should be responded to

within one to two. Partner with a contractor that is flexible, able to satisfy response times and has a sound emergency and escalation process in place. Lastly, partner with a contractor that has demonstrated experience coordinating with the local One Call service.

**Employ the right technique:** A wide variety of technologies and techniques can be applied to verify the presence or absence of a cross bore. Generally, a contractor will begin the inspection by conducting records research followed by a utility locate. The success of this approach is largely dependent on whether accurate records exist. If the results are inconclusive or require verification, a CCTV video inspection will follow. This is usually carried out by entering the sewer line with a camera attached to a sonde, from the main up to the lateral or from the building clean-out toward the street. The sonde transmits a radio frequency that reports the horizontal position and approximate depth of the lateral. A push camera is ideal when access is required to the lateral through a residential clean-out, particularly if the lateral is blocked from the main line.

**Coordinate and communicate with local stakeholders:** A successful Cross Bore Safety Program requires coordination and communication among several stakeholder groups, and as such, a framework must be established to coordinate information exchange. Programs are generally spearheaded by the utility owner which partners with the provincial One Call service. The utility owner communicates information to drain cleaning contractors, residents and municipalities around the importance of contacting One Call prior to clearing a blocked sewer pipe. Upon receiving requests, One Call will then coordinate with a utility locate contractor that is working on behalf of the utility owner. The contractor will be responsible for analyzing records, fulfilling locate requests, managing tickets, producing reports and communicating project status back to the utility owner and other stakeholders.

Local municipalities also play a role and should assist with education and awareness by communicating important information through their websites and directing homeowners, plumbers and sewer departments to contact the local One Call service for

an SSI prior to clearing a sewer blockage. Information should also be shared with municipal staff and the public works department. Boyes cited awareness and education as the most essential component of a safety program:

"The average do-it-yourself handyman may not even consider the threat of a conflict when working on home repairs or other projects. For a drain cleaner that has never come across a cross bore in the past, he or she may view the level of risk as inconsequential. Luckily, this risky thinking is shifting as we see more attention being focused on cross bore safety through best practice initiatives, training programs, and articles."

**Invest in sound, secure record keeping:** Sewer inspection records will only maintain their value if data is stored in a secure, retrievable manner. A popular choice is Geographic Information System (GIS) software which allows data to be systematically catalogued, organized, and shared. Using this tool, data can be catalogued based on risk attributes which can assist with prioritizing projects. Also, the ability to geographically digitize and retrieve information provides a valuable resource for contractors conducting inspections. Contractors can access a GIS map database as they check inside sewer mains and laterals with CCTV equipment, and then directly add their inspection data. Data can be easily updated to keep track of areas that have been inspected and cleared, areas that still need to be cleared and the results of the investigations. Ensure that your record keeping system is fully auditable and that CCTV inspection videos are date and time stamped.

"Having a data management system in place is one of the most important steps for a utility that is launching a legacy program," said Boyes. "In addition to managing inspection records, the ability to access and evaluate other types of information provided by plumbing companies or municipal partners is invaluable."

To learn more about cross bore safety, a good place to start is by visiting the resources made available by the Cross Bore Safety Association which includes leading best practices.

**Kevin Vine** is president of multiVIEW Locates.