

Excavation Safety

An Evolving Challenge

Growing Underground Infrastructure Locate Demand Requires Changes, Pro-Active Approach

by Robert Shively, President, SM&P Utility Resources, & President, National Utility Locating Contractors Association (NULCA)

Effective damage prevention and good management of buried utilities require attention to a number of details, including evolving regulations, infrastructure changes, intentional planning and adaptation/utilization of new technologies. The stakes are high in terms of life and property protection as well as construction cost. Fortunately, awareness of the value of cooperation and partnership between participating organizations based on mutual safety objectives is growing in both the construction and locating/marketing industries.

Damage to underground utilities in the U.S. has resulted in millions of dollars of financial loss and hundreds of deaths over the years. In the past, protection of the infrastructure was less coordinated and intentional than today, and response resided solely with the utilities. The probability of unintended contact with facilities during excavation was high. State governments began to address this probably individually more than 30 years ago. For example, a pilot program was established in Michigan in 1970 to reduce underground utility facility damages, prevent injuries and save lives, and by 1974 Michigan and several other states had established state-wide notification systems to find and mark buried utilities prior to excavation.

These notification systems came to be known as one-call programs, comprised of



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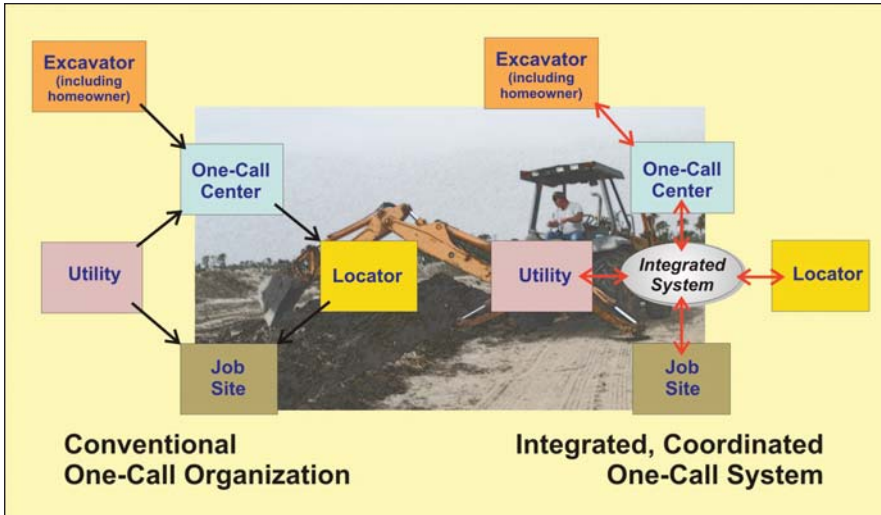


Figure 1 – More effective one-call integration of participants, with longer-term planning and coordination of schedules would reduce safety costs and improve safety results.

communication networks to serve as points of contact for excavators to provide advance notice of work and give utilities time to locate and mark their buried facilities. In 1998 the United States Congress enacted national one-call legislation, recommending that each state establish a standardized one-call utility notification system in cooperation with utility companies and excavators.

Early in the adoption of one-call programs, each utility would respond to an excavation notice by sending its own crew to mark buried facilities. It soon became apparent that a single provider capable of marking all of the buried facilities at a site could operate much more efficiently, as well as effectively, and service providers began to specialize in locating buried utilities.

The National Utility Locating Contractors Association (NULCA), formed in 1994, is an organization of contract locators, along with facilities owners and industry suppliers that share a common interest in safety and damage prevention. This industry group was a major contributor to a study of underground infrastructure issues by the Common Ground Alliance (a broader trade group) and the U.S. Department of Transportation (DOT). Results of this study were published as the *Common Ground Study of One-Call Systems and Damage Prevention Best Practices*. Version 3.0 of the *Best Practices* was released in March 2005, representing an evolving set of procedures based on experience and wide industry representation. This document has become an accepted performance standard for state managed one-call programs across the U.S.

One-call programs today

One-call work orders are commonly based

on a two-day or three-day response schedule, depending on individual state standards, with efficiency acting as the driving force. This process of utility locating and marking is transactional in nature – centering on the need to locate and mark facilities quickly on a transactional basis so that construction work can proceed safely without undue delay.

This time-sensitive approach has led to heavy demand on contract locators for staffing, training, equipment and service response. This results in unnecessary inefficiency and higher costs for utilities, excavators and locators. As a system in which unpredictable arrivals (one-call orders) place demands on a finite capacity resource, the one-call process is a queuing system. Statistical queuing theory confirms that with intentional scheduling a more economical one-call response system with greater reliability is feasible.

In order to capitalize on the virtues of known queuing theory, one-call systems would need to accept varying lead times for work, callers into one-call would need to provide more lead time, and locating companies would have to increase their sophistication level of planning and organizing work. Moreover, the work flow management system would need to be integrated across the user groups. Once this is done, however, the business system would be much more efficient than today's. That efficiency would lower costs, increase reliability and promote work site safety.

Over the years, participants in the one-call process have balanced improvements in locating and marking effectiveness with short-term efficiency. With the technology and sophistication levels of the key stakeholders improving, it is time to see the tra-

ditional transactional mindset in one-call response evolve in the direction of a broader protection mindset. The protection mindset balances the need for immediate response to meet construction schedules with more realistic planning, improved communication of work performed and more complete, accurate and up-to-date utility records. The vision is to support improvements in safety and facilities protection from job-to-job along with creating a more informed, well-documented and cost-effective approach to safety and facility management.

This vision calls for coordination and integration of the activities of all participants in the process. The one-call authority needs to know what excavators are doing and what their schedules are over the medium and long term as well as short term. There needs to be real-time transfer of data between the various parties involved in facilities protection, with closer coordination of activities. Figure 1 is a conceptual diagram of this integration concept.

Next step

As utility owners and excavators grasp the value of a broader protection mindset compared to the reactive transactional mindset, they will turn to locating providers for a wider range of services and capabilities. Locators can take a greater role in infrastructure management by providing added services such as exploratory hand digging and potholing, permanent electronic underground marking, global positioning system (GPS) coordinate recording, and support of geographic information system (GIS) multi-layer facilities mapping. As the timeliness, accuracy and completeness of information on underground assets improves, it should be possible to reduce the demand for inefficient emergency locating requests.

This broader emphasis on protection will/should prompt review of the established "one size fits all" one-call response time of two or three days. With more intentional scheduling, routine work could be planned out more effectively over a period of weeks rather than just two or three days in advance and locators would have the flexibility to move assets and assign resources as needed without jeopardizing their ability to complete routine work on schedule. Although transaction costs may increase to some degree, better locate scheduling will benefit contractors, excavators and facility owners by reducing damages and improving protection, which will lead to improved efficiency and lower overall cost.

To reach this next level in one-call efficiency, there will need to be an industry driver with both the vision and the broad influence necessary to effect change. This

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change agent must bridge the existing stakeholders, identify common interests and create an effective process to improve legislation and develop a more integrated and coordinated one-call model. Issues related to homeland security have begun to change our approach to municipal and community safety policies, and a new sensitivity to community coordination and sensitivity to common interests seems to be emerging. This changing cultural landscape offers fresh promise of openness to new and more sophisticated one-call business systems.

Partnering for safety, economy

The concept of more efficient one-call scheduling implies collaboration between locators and excavation contractors to achieve common goals. This kind of partnership effort is already underway in some quarters, as demonstrated by the relationship between SM&P Utility Resources, a locating and marking company, and Trench-It, a large Illinois excavation contractor. Both companies are Contractors of Choice (COC) for Commonwealth Edison (ComEd).

Matthew Turk, Trench-It vice president of operations, explains, "As businesses with a common customer, SM&P and Trench-It find it helpful to discuss locating issues and work together proactively to solve challenges. We're both in high-pressure and time-sensitive businesses, and our ComEd COC connection makes it easy for us to stay in touch and avoid adversarial situations that could impact safety as well as profitability.

"Trench-It and SM&P representatives meet regularly to refine best practices and find ways to make their jobs easier and more efficient. Twice a year we hold safety meetings and review plans and objectives for coming work. These regular listening sessions help both companies understand the needs of the other, keep the lines of communication open, and promote safety."

Turk explains that this partnership alliance has resulted in useful work changes. Trench-It crews now white-line excavation areas at jobsites so that locators can limit their work to pertinent areas. SM&P provides supervisor level call-back numbers and responds quickly to questions or job-site problems so that work can proceed on schedule.

"We've found that a spirit of partnership and mutual benefit has moved from top management to the front-line supervisor level at both companies," said Turk, "and we function much more proactively as partners in damage prevention. As an excavator, we need the best combination of locate timeliness and accuracy, and this communication between companies is resulting in

safer jobsites and improved infrastructure protection."

Special underground locating requirements

One of the fastest growing aspects of underground locating is work done for privately-owned properties such as office complexes, shopping centers, medical centers, universities and airport complexes. All of the buried facilities that extend beyond the utility meter or wiring terminal are the responsibility of the owner and will not necessarily be located and marked by means of the one-call system.

Locating services are typically provided to private facility owners by smaller firms that specialize in these types of services, and there is increasing demand for these companies to act as outside partners with the private facility owner to assist with locating, marking, mapping and managing private buried facilities. Such services may be beyond the resources of small operators, which are commonly equipped to operate on a locate project basis rather than taking a broader support role.

Yet another locating category not included in the normal one-call system is residential locating. Like private business complexes, any buried elements on residential property that extend beyond the public utility termination are the responsibility of the homeowner. This includes components such as power, gas and water lines extending to swimming pools, supply piping to gas grills, buried power lines and pipes between buildings, etc. Thus residential construction work may entail both municipal one-call and private locate support, and residential owners need to be aware of both their safety responsibilities and available locating resources.

Conclusion

With the rapid technology evolution and the dependence of both individuals and small and large businesses on an interconnected infrastructure, utility damage has an increasing potential for grave impact. For example, loss of telecom service in today's complex and intertwined world of technology could seriously affect internet connections, email services, video, banking and credit transactions. Disruption of the 911 system would create a major public safety threat.

Damage prevention is important to the backhoe operator, his or her fellow workers, the local community, and to an ever-widening circle of people and public services spreading across our communities. It requires careful record-keeping, consistent locating and excavation performance, lon-

ger-range planning, intentional partnering and systematic coordination between utilities contractors, locators, one-call systems and facility owners if we are to preserve safety and deliver utility services at the least possible cost. Now is the time for creative thinking and proactive cooperation in the quest for continuous improvement in infrastructure protection.

About The Author: Robert Shively is president of SM&P Utility Resources, Inc., Carmel, IN, one of the nation's largest underground locating and marking service providers. SM&P performs more than 15 million locates annually for telecommunications, cable, water, gas and power companies as well as municipalities. The company also serves residential owners and private facility owners such as hospitals, campuses, airports and business centers. A subsidiary of The Laclede Group, Inc., SM&P employs approximately 2,500 people and operates in Illinois, Indiana, Kansas, Michigan, Minnesota, Missouri, Oklahoma, Texas and Wisconsin. SM&P Utility Resources, Inc. 13085 Hamilton Crossing Boulevard, Carmel, IN 46032. Telephone 317-575-7800. www.sm-p.com

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