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Pictured (left to right): Brandon Lough, Leah Borley, Bav Mistry, Jodi Burch, Tyler Chapin, Jondon Wilson, Tony Van Mierlo, Sara Ward-Paige. Missing from picture: Cher Burger

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The Ontario Regional Common Ground Alliance (ORCGA) is an organization promoting efficient and effective damage prevention for Ontario's vital underground infrastructure. Through a unified approach and stakeholder consensus, ORCGA fulfills its motto of "Working Together to Build a Safer Ontario."

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# EARS TO THE GROUND

By Doug Lapp, President & CEO

**U**tility Locating identifies and marks underground public and private utilities, including sewer and water, electric, oil and gas, telecommunication, fiber optics and more.

Locators provide detailed information about the presence and location of underground infrastructure assets to prevent possible damages during excavation or other activities. Not only do underground infrastructure assets need to be protected, but they can also pose a potential safety hazard to workers on-site, the public and property, if damaged.

Like the buried infrastructure they are seeking and identifying, Locators are generally unknown to the public.

And, like the buried infrastructure and utilities that we all depend upon at home and at work, Locators are **everywhere!** Locators can be found working on quiet residential streets or busy thoroughfares and highways, in dense urban cityscapes and across farmlands.

Locators are employed by municipalities and utilities, specialized locating companies, engineering firms and excavation contractors, in order to enable hundreds of construction, geotechnical and engineering projects throughout Ontario every day.

The Ontario Regional Common Ground Alliance (ORCGA) works to effectively eliminate damages to underground infrastructure through influential

advocacy, meaningful education and impactful engagement, in part, through channels such as *Ear to the Ground*, the DPT® Certification Program, the continuous improvement of Best Practices and the Locate Rodeo.

The articles in this issue shine a spotlight on Locators who are on the front lines of the Damage Prevention Industry, to elaborate on, promote and enhance the value of their role to industry in the province of Ontario.

This issue of *Ear to the Ground* focuses on:

- ✓ The History of Locates in Ontario;
- ✓ Locating in Dense Urban areas;
- ✓ The Challenges of Private Locates; and,
- ✓ Ontario One Call Notification Changes.

The ORCGA runs the very successful Damage Prevention Technician, DPT® Certification Program that provides instruction on the fundamentals of locating based on processes employed by specific industries.

In addition, the ORCGA recently welcomed all competitors and volunteers to the 10th Annual ORCGA Locate Rodeo in August. The Locate Rodeo is a cornerstone event for the ORCGA; a chance for Locators to display their skills in a competitive and friendly environment. The introduction of the Excavator Challenge competition complements the Locate Rodeo with a skills competition from “the other side of the shovel”.

Lastly, the ORCGA, our sponsors on the opposite page and over 530 members will continue to focus on and promote Locating and Marking Best Practices found in the latest edition of the Canadian Common Ground Alliance *Best Practices* ([orcga.com/publications/best-practices](http://orcga.com/publications/best-practices)), and the Dig Safe message, as below:



The ORCGA recognizes the dedicated Locators across the province of Ontario for undertaking the complex task of underground utility locating and their role in damage prevention.

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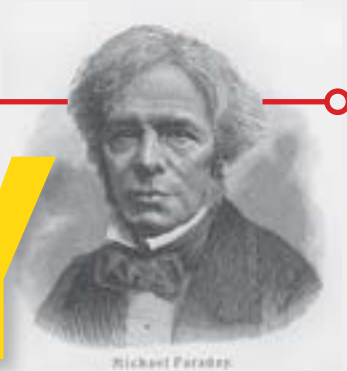


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# THE HISTORY OF LOCATES IN ONTARIO

By Dave Wulff, General Manager, Vivax–Metrotech Canada

**L**ocates have been performed for as long as utilities have been placed in the ground; however, the process has come a long way.

The concepts involved in performing a locate typically include seeking out, or

creating an electromagnetic field, that ideally surrounds a buried conductor, and using a receiver to locate the center of the field and mark out the ground.

Early research was carried out by Michael Faraday (22 September 1791 – 25 August 1867), an English scientist

who contributed to the study of electromagnetism and electrochemistry.

It's not widely known, but gas distribution was first introduced to "Muddy York", as Toronto was then called, circa the mid 1800's (prior to Confederation!). The infrastructure was primarily located



This picture demonstrates Locators in 1910 using a crude receiver (a roof truss with wire stapled to it) which was very labour intensive. Depth measurement would have been provided by workers with shovels. For more information please visit <https://www.radiodetection.com/en/cable-and-pipe-location-theory>

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## Early locate equipment was basic: typically, a box type with a single frequency, low output, offering no reliable depth measurement that was manufactured by firms like Fisher (M-scope) and the Metrotech (480). Training on usage was minimal.

in the “downtown” area and which distributed a manufactured gas, created from coal.

Natural gas began to be piped throughout larger cities in the early 1900’s. The history of utility locating in Ontario really began to take shape in the 40’s and 50’s when natural gas distribution networks ramped up installation. By that time, natural gas was becoming available for consumers.

Up to that point, most other utilities didn’t typically require locates. Water and sewer, for most of Canada, was a minimum of 5-7’ deep and power and telephone were largely installed above ground.

It was the introduction of networks that were entirely underground, having the potential to cause death and destruction, which created the pressing need for safe, reliable locates.

Several key factors hindered the advancement of the locate industry:

First, many of the buried utilities were installed by linemen who worked for the same utility for decades. Memory was heavily relied on.

“Pretty sure we buried it there, Frank. Near that tree. Or was it that other one?”

Not very efficient, but it worked... sort of.

Second, there just wasn’t as much digging in Ontario. Newly installed infrastructure networks had yet to fail and urban development was much slower than the current pace.

Lastly, emergency locates were often done by folks on a rotating night and weekend call schedule. It would be normal for a locator to do 2 or 3 locates every month or so; nowhere near enough practice to be considered proficient.

Early locate equipment was basic: typically, a box type with a single frequency, low output, offering no reliable

depth measurement that was manufactured by firms like Fisher (M-scope) and the Metrotech (480). Training on usage was minimal. I recall being introduced to the business over 40 years ago by receiving a 45 second training demonstration on my locating equipment!

It wasn’t until the 1970s before multiple frequency locate sets began to emerge with a little more oomph. It was a marked improvement over what had been available.

As communities all over Ontario rapidly expanded, more utilities were placed in the ground. The resulting underground congestion challenged those who tried to find them for repair or damage avoidance purposes.

During the 1980s and 1990s, a number of the original buried networks began to fail in many major cities. Replacing the 50 year old infrastructure in congested utility corridors required better locate practices and equipment and the concept of specialized technicians who focused their attention on locating within their utility began to emerge.

Progressive utility owners began to utilize locate service providers (LSP’s) to do the work on their behalf, allowing the utility operations staff to focus on the equally critical functions required to run vast networks. It also allowed locators to hone their skills, through advanced



Electrical Inductive pinpointing of electrical cable.

Theory of buried cable and pipe location.


training, practice, scheduling and operating efficiencies.

In the 1990’s, comprehensive contracts were given out by the larger utilities, whereby one contractor began to locate multiple utilities.

Another emerging trend was the use of Subsurface Utility Engineering (SUE) to more fully understand what infrastructure is in the projected path of a project. SUE has saved millions of dollars by helping to avoid the “surprises” that cost so much in re-planning and project delays.

In 2012, Bill 8 was passed making participation in Ontario One Call mandatory for virtually everyone who has infrastructure in the ground. An excavator can now contact Ontario One Call to begin the excavation process and Dig Safe.

Currently, locates, and locates on private property, are done by contractors, utility staff or the excavator utilizing multi-frequency, high power gear and accessories.

What’s in the future for the locating industry? New developments such as “Map as You Locate”, cloud technology, advanced data gathering and processing capabilities will probably be utilized even more than they are today. But one thing is for sure: Locators will always be at the forefront of damage prevention, and the protection of underground infrastructure assets workers on-site, the public and property. 



Dave Wulff has been involved in the provision of locating gear, training, consultation and helpful advice for over 30 years. He is on the Board of Directors of the ORCGA and spearheaded the initiative to create focused training and a recognized designation for professional locate staff, Damage Prevention Technician, DPT® Certification Program.

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# WALKING IN A LOCATOR'S BOOTS

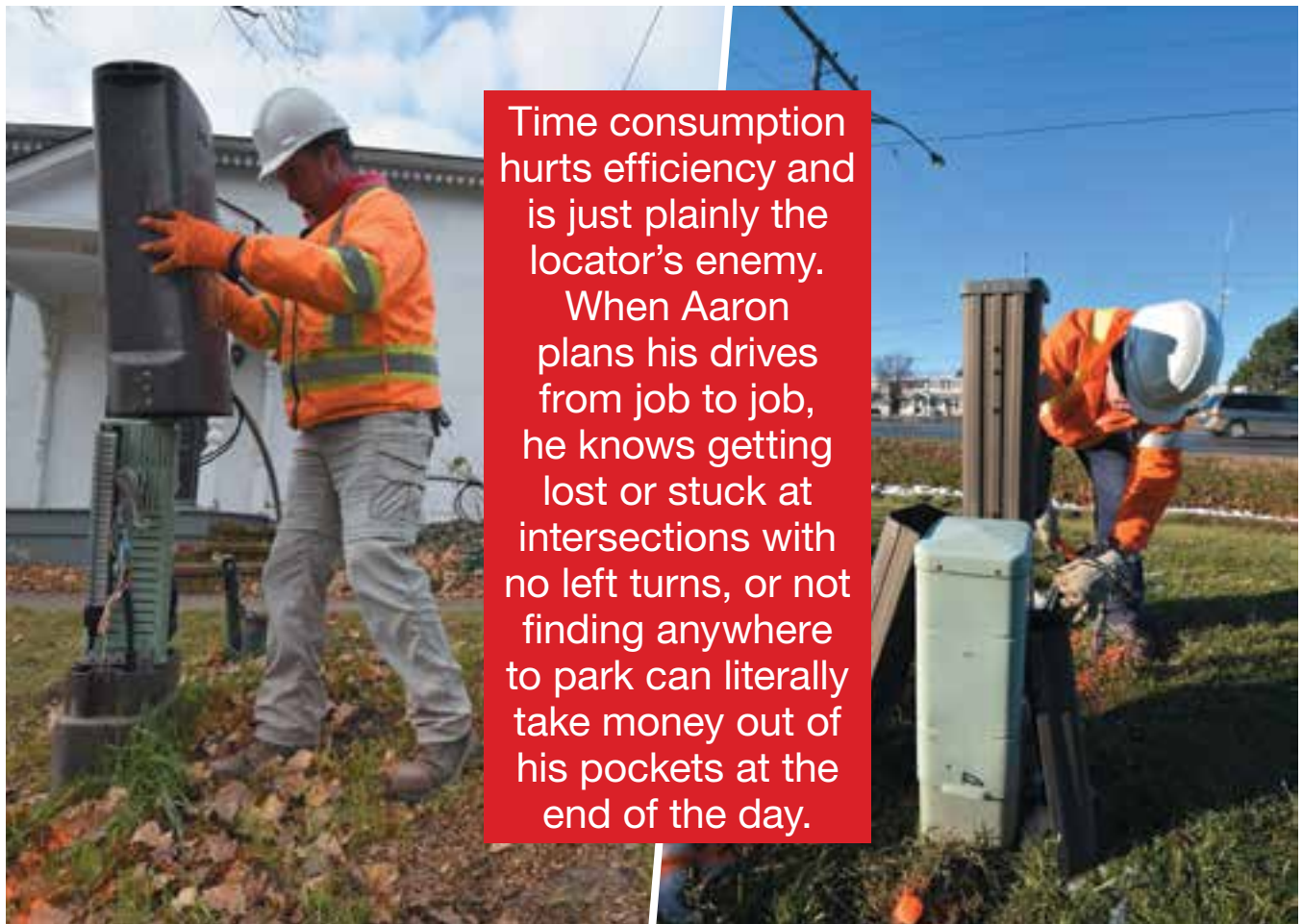
## Meeting the Daily Challenges of Dense Urban Locating

By Jason Edwards, Director of Operations, PVS Contractors Inc.

**T**he morning sun makes its appearance over the horizon and Aaron is already getting himself and his equipment

ready for a day of locating. With the morning traffic congestion and the extra time it takes to find parking for the work van, Aaron knows the

challenges he'll face today in the big city are much more difficult than the ones he faced in the past doing locating in a suburban area.



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Aaron has been working as a Damage Prevention Technician for 6 years. He first started locating in a sparse suburban area and now transferred into the big city to help serve PVS' growing customers' needs. When Aaron decided to transfer into this new urban area, he knew the distance was closer to his home, but other than the distance, Aaron didn't consider how the new location would impact his day-to-day activities.

Only a couple days into operating in his new work area and Aaron already understood that jobs in the city just take longer to complete and drive to. Time consumption hurts efficiency and is just plainly the locator's enemy. When Aaron plans his drives from job-to-job, he knows getting lost or stuck at intersections with no left turns, or not finding anywhere to park can literally take money out of his pockets at the end of the day.

Aaron pulls up to his first job of the day and checks parking signs carefully. There are so many tow zones in the city and parking in an incorrect zone can ruin an entire work day. He gets to work locating the utility lines and realizes he needs to capture some markings on the roadway. Aaron makes a call to his supervisor so he can get traffic safety assistance.

Aaron turns on his van's warning lights and high power traffic directors. Cars whizz by as he waits for an opening to lay down some pylons. His supervisor keeps an eye on potential traffic hazards while Aaron works quickly but cautiously. The sun catches the reflective strips on his vest providing advance warning to motorists. Traffic is heavy with aggressive drivers and the pylons don't make Aaron feel any safer as cars race by. There is so much movement and noise on the street, it's easy to become distracted and slip-up. But Aaron focuses his senses and completes the locate without encountering any safety near-misses.

At the next job site, the utility corridor is congested with infrastructure and Aaron has difficulty distinguishing between the utilities. He looks at each utility record, including multiple utility sub maps. Aaron then tries to find a



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physical connection point for the utilities; unfortunately, connection points can be easily hidden in urban centers and if a tonable connection cannot be made on any of the utilities to either match or identify new infrastructure then Aaron will need to call his supervisor again. Aaron starts to realize he may need Ground Penetrating Radar, assistance from the utility or potentially a hydrovac truck to visibly identify the utilities.

At last, Aaron finds his connection point. It's paramount he identifies the lines correctly to the customer's plant to prevent damages. Pedestrians walk by Aaron barely noticing the markings on the ground. One marking mistake can leave these people not only without services but with increased service costs. Aaron recalls a few best practices from his ORCGA Damage Prevention Technician, DPT® Certification Program and his PVS Best in Class training. He wipes the sweat from his forehead as he confidently identifies and marks another utility line.

Aaron finds that the access to the plant at his next job site is locked up. It's pretty common in the city to have difficulty accessing plants to connect and confirm locates, especially when conduits enter a building below grade. Aaron places a call to the utility company to get his needed access, and while he waits, a PVS colleague phones to review a couple jobs Aaron completed recently as part of PVS' quality assurance program. This call happens a couple times a month and the conversation is brief but covers some positive feedback and identifies some opportunities for Aaron to improve his job efficiency and accuracy.

Soon Aaron gets admittance to the plant and starts unpacking his locate set, and moments in he realizes he's forgotten a piece of his PPE. He packs everything back up to bring with him to the van to retrieve his PPE. In his old jurisdiction he may have left his equipment without worry, but he wasn't going to take the risk in this neighborhood. Equipment costs are expensive and Aaron is responsible for ensuring his equipment is accounted for.

At the end of the day, Aaron packs up his equipment and is relieved to see he's only 15 minutes over schedule. He sighs with satisfaction knowing he has accurately marked all the utilities today at his assigned sites. The excavators will have all the information they need to complete their projects safely. Aaron knows the vital role he plays in keeping excavators, the public and infrastructure safe, while ensuring Ontario's infrastructure projects keep moving. 

PVS Contractors Inc. is celebrating its 40th year providing underground locate services to utilities, cable companies, municipalities and residential clients. Part of the OEC group of companies, PVS is one of several businesses in OEC's dynamic portfolio that participates in and serves Canada's energy and infrastructure marketplaces. If you have any questions or comments about locating services in dense urban areas, please email [office@PVSlocates.com](mailto:office@PVSlocates.com) for more information.



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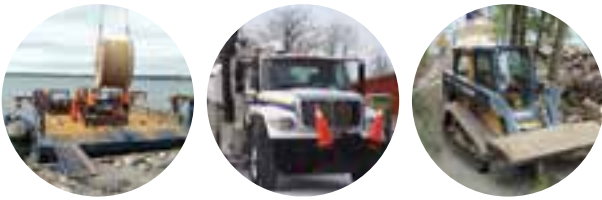
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# THE CHALLENGES of Private Locates

By John Scaife, P.Geo. Director URBAN X and Grant Piraine, C.E.T., DPT

## INTRODUCTION

Thanks to the Ontario Underground Infrastructure Notification System Act and the concerted efforts of all Ontario public utility stakeholders, including the ORCGA, awareness regarding underground utility damage prevention continues to result in significant increases in locate requests with a simultaneous relative decrease in the number of damages caused by excavators. The system of processes, responsibilities and regulations regarding these “public locates” are well documented and understood; however, the “private locates” system is much different.

From a technical perspective, the processes by which public and private utilities are physically traced and marked are very similar; in fact, the locate equipment, procedures and operational requirements are virtually the same. However, private locate contractors face additional challenges than their public counterparts including: incomplete or non-existent records, varying business environments and operational conditions which are most at times very different. To understand and appreciate these challenges, we must examine the stakeholder roles and the public and private utility locate processes.

## UNDERSTANDING STAKEHOLDER ROLES

To begin to understand the challenges of private locates, we need to understand the roles of the major public utility stakeholders typical to the locate industry in Ontario:

- The public utility owner: the owner of the underground utility who is responsible for installation, construction, operation and maintenance of their assets. The role of the utility owner includes responsibility to their shareholders, stakeholders and customers for service delivery continuance through protection of their underground assets which includes proactive damage prevention via the utility locate process;
- The locate service provider: the utility locate service is provided by either the utility owner’s internal resources or a sanctioned contractor. The role of the damage prevention technician (DPT) is to protect the underground assets of the utility owner from damage due to excavation;
- The excavator: the party responsible for breaking ground that, under OHSA, has a duty to ensure that locates are completed.

## PUBLIC LOCATES

The entire public locate process is controlled and paid for by the public utility owner, including education and awareness, the resources at ON1Call and provision of DPT locate documentation; this work is completed to the standards, tolerances, insurance requirements and business practices of the utility owner and relevant Provincial regulations. This process follows business logic that is in the best interest of the utility owner to protect their assets using developed systems, protocols and procedures. The legislated ON1Call system ensures that

all utility owners within the public lands are notified of the excavation request so they can facilitate public utility locates to protect their underground assets keeping workers and the public safe.

Public utility owners not only pay for asset protection but are also fully supportive of the public locate process. In most instances, if a public utility owner does not have a record showing the location of the underground asset, or the underground asset cannot be accurately marked by the DPT, the public utility will take custody of the issue and look for alternate means of supplying this information to the excavator.

These public locates are provided on underground utility plant owned and maintained by the utility. Public utilities are within the municipal right of ways and road allowances and may exist on private property via easements. The public utility owner is responsible for its assets to the point at which they have delivered their ‘service’ to their customer, or the demarcation point. Prior to the demarcation point, the public utility owner will take responsibility for protection of their asset by providing locates. Beyond the demarcation point, the utility owner does not own the asset will not provide asset protecting locates.

For example, a gas distribution company’s assets include ownership of the all gas distribution plant up to and including the regulator/meter on each private property; the demarcation point. The landowner can retain an authorized contractor to install additional gas lines within their property to

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service equipment or out-buildings. However, the gas company doesn't own this landowner installed segment of underground gas plant beyond the demarcation point, this asset is owned by the private property owner.

## PRIVATE LOCATES

Although the technical processes to protect the private assets are essentially the same, the private locate process is structured by the independent business practices of the private locate contractor and their contractual relationship with their typical client, the excavator. The key differences here are utility ownership awareness, business environment and operational conditions.

It is in the best interest of any owner to protect their assets. For a private business landowner, these assets include any structures, systems, resources or staff which assist in the generation of revenue. However, they often don't realize that their responsibility also extends to their underground assets, and as such, they are a key stakeholder in the asset protection utility locate process.

Contractually, the immediate client for the private utility locate contractor is rarely the asset owner (landowner) but a representative, professional consultant or contracted party (excavator), retained by the asset owner or tenant to facilitate evaluation and/or change of the owner's physical assets. Private locate contractors are typically hired by these third parties, not the asset owner, such that the third party is procuring and paying for the private locate service. Although the role of the DPT is protect the utility owners assets, the subtle distinction is that the private locate contractor is not really hired to protect these underground assets but to protect their client (usually the excavator) from damaging these assets.


Operationally, following industry established protocols (see CCGA Best Practices) the utility records such as all maps, documents, notes, construction as-builts, etc., possessed by the asset owner should be provided by the asset owner to the private locator

to complete their work. However, this information is often not supplied to the private locate contractor, either by the asset owner or by their client (usually the excavator). Ideally, the asset owner should make all information available and ensure access is provided to all hook up points (via maintenance rooms, utility rooms, etc.) so that the private locate contractor can fulfill their role of protecting the underground assets. Subsequently, these requirements often fall to the excavator or to the private locate contractor to insist on reviewing drawings, inspecting mechanical rooms and utility structures, and interviewing facility personnel about buried utilities. This arm's length communication often results in compromised information that diminishes the private locate contractor's ability to protect the owner's underground assets.

Consequently, private locate contractors are often challenged to sleuth out the underground private utility network without any utility drawings, building access, or asset owner cooperation. The private locate contractor's client, often a third-party excavator, may even ask to 'clear' excavation locations, when the private locate contractor has no idea of what may be buried or where the hook up points are to assist in defining these underground assets. Challenged to protect the underground assets of the asset owner, often without support from the asset owner, the private locate contractor is contractually bound to a third party client, and placed in the difficult position of providing comprehensive results while being held accountable for restitution of errors and omissions. This operating environment has led to a variety of business practices and accountabilities for private locate contractors and their clients; very different than the standardized process controls and regulations governing the provision of public locates.

## SUMMARY

The public utility locate process is well established and through industry awareness, commitment and regulations is working better every day in

Ontario at protecting the underground assets of the public utility owners from excavation damage. The public utility locates are paid for and controlled by these asset owners and the role of their DPT representative is to protect these assets. The private locate contractor is typically challenged to complete the underground utility locates without the underground asset owner support, enter a contractual relationship with a third party excavator to prevent their client from damaging the owners underground assets and deliver flawless information in order to receive remuneration for services rendered. Technical issues aside, these are certainly significant challenges for the private locate contractor. 

## ABOUT THE AUTHORS:



**John E. Scaife, P.Geo.**, currently Director of Urban X, has been involved with the utility protection industry for over 20 years including provision of private locates, public locates and subsurface utility engineering services. John was elected ORCGA Member of the Year in 2011 for his work regarding raising awareness of private locates including championing ORCGA adopted private locates best practices. He currently sits on the DPT Certification Committee and is co-chair of the Best Practices Committee. John would also like to thank Mr. Jeremy Cook of R&B Construction Services Inc. for his editorial assistance.



**Grant Piraine, C.E.T., DPT**, is the founder of OnSite Locates Inc. and has been an active member within the ORCGA since 2005. Grant was one of the co-authors of the ORCGA Damage Prevention Technician (DPT) Training Manual and is a former DPT Course Trainer. He has published numerous articles for the private locate industry including one of the feature articles "Locating Private Underground Utilities" in the inaugural issue of the ORCGA Ear to the Ground magazine. Grant is currently Chair of the task team to draft a Private Utility Locate Best Practice for the ORCGA.

# Locates Made Easy for All of Us

By Crystal Bedore, Education and Training Program Coordinator, Ontario One Call

**O**n **December 4th** of 2017, Ontario One Call will be notifying the infrastructure owner of any excavation based on the physical location the excavator marks out on our satellite image. This map selection should be as precise as possible, to reduce the possibility of notifying utilities that may not actually be near the work area. By reducing the notification area, we are reducing the number of utilities, from which the excavator must wait for a response. This means there would also be less administrative work, fewer expiration

dates to monitor and less paperwork that is required onsite.

To support this change, Ontario One Call has taken steps to improve the user interface and experience for those submitting locate requests through the Web Portal application. The overall goal of the change is to encourage all professional excavators to submit their own locate requests online.

The web portal requires that a selection depicting the exact work area be included with every locate request. The selection will be made using a line tool or a shape tool, or perhaps both. Most

work areas would be selected using the shape tool, while few should be selected using the line tool. The line tool is perfect for linear work such as fences, cable or utility installations or sidewalks. If there is any uncertainty about which tool to use, always choose the shape tool.

Although the map selection will show where the work is being done, the excavator will still be required to provide written location information, including city or town, civic address (if applicable), dig street and two intersecting streets. The map will populate based on the location provided and may even identify the



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address using a pin drop. The address pin drop should be used as a reference only as civic address information is generated based on the Google API and may not be completely accurate. The excavator may verify the location using Google street view (right in the web portal), providing addresses are visible, or by using an alternate map.

For those excavators that are familiar with their work area, identifying it on a satellite image can't get much easier. It really does simplify the locate request process. However, those that are submitting locate requests from the

office could be at a disadvantage as they are typically not familiar with the actual work location. They would greatly benefit from getting additional information from field crews. There are a few options that we recommend to address this common office to field disconnect.

A satellite map with the work area outlined would be ideal, as this would allow the work area to be replicated easily. Another option is to provide measurements from the nearest intersection. We have a measure tool right in the map that can help you get to the right location. Lastly, field crews should provide

a very detailed description of the work area, including information relating to the work location on the street segment, as well as the inclusion of landmarks and offsets to describe the work area.

This may be the perfect time to review your internal processes to make sure what the office needs to be able to quickly submit a locate, is being provided by the field.

Use your time now to practice and gain feedback about your selections so that you're ready in December. If you're not sure about the selection you've made or want feedback on it, reach out



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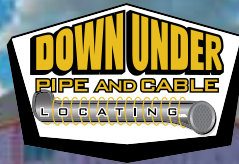
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to [solutions@on1call.com](mailto:solutions@on1call.com) with the ticket number to discuss your selection.

A map selection is not just required for web tickets; it will be required for any locate requests that are called in as well. In this case, it will result in the Agent making the map selection for the excavator. In order to ensure the selection encompasses the complete work area, the Agents will need to make a larger map selection than what is actually needed, which could generate notification for additional utilities. We strongly encourage all excavators to submit their own locate requests through the web portal to avoid any possible delays and extra administrative time resulting from additional utilities being notified of the dig.

The improvements that have been made to the web portal have come as a direct result of your feedback. It's imperative that the web portal meets the needs of the user. If you feel further improvements can be made to the Ontario One Call web portal, please share that information with us. We share the mutual goal of ensuring all work sites in Ontario are safe and all workers go home at the end of the day. Only with your help can we continue to be successful in this endeavor. 

Ontario One Call is hosting web training sessions to help with some of the more difficult mapping situations. Email [Solutions@on1call.com](mailto:Solutions@on1call.com) for the link to the current sessions or visit our YouTube channel at <https://www.youtube.com/channel/UCnwjQMBxkG4QrPW2q5sbjPA/videos> to view our previous training videos. If you have any questions, concerns or challenges you would like to discuss, please email us at [solutions@on1call.com](mailto:solutions@on1call.com).



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