Ontario Regional ORCGA Common Ground Alliance

DIG SAFE

2019 DIRT Report

Ver 13.0

Damage Prevention Stakeholders:

Every day across Ontario, the risk of damaging underground utilities exists at each excavation job site.

The consequences of severing a natural gas line, an underground power line, a fibre optic cable or damaging a vital water main can be costly. Utility damage prevention has high economic importance when direct costs such as repair labour and materials are considered, but especially when societal costs are factored in, such as worker injuries, emergency services interventions, work and traffic delays and legal costs. Indeed, in 2019, the Socio-Economic costs for the province of Ontario totaled $670M+, and the average cost per incident totaled $136K.

The Ontario Regional Common Ground Alliance (ORCGA) has been collecting underground damage data since 2005 to better understand the root causes that lead to these events and to develop and target public awareness plans to minimize the risk of future events.

The overall number of damages in 2019 decreased from 2018 by approximately 8%, bringing the number of recorded damages below 5,000 to 4,940. There was a 4% increase in locate requests and a corresponding increase in One Call notifications of 2%.

Substantial reductions in damages were observed in the high construction activity areas including Toronto (283 less damages or 14%) and London-St. Thomas (52 less damages or 20%). Conversely, increases in damages were realized in Grey- Bruce (29 more damages or 38%) and Ontario North-West (5 more damages or 11%).

In addition, the trend of increasing numbers of damages where no locate was requested rose to 39% or 1937 of 4940 damages (37% in 2018).

To prevent such incidents, it is critical to first understand the possible causes and practices in place.

The most prevalent root cause for incidents resulting in underground utility damages is related to Excavation Practices not being sufficient, similar to previous years, although there has been a 15% reduction in damages due to excavation practices from 2018. While trends for the specific reasons behind improper excavation practices are not apparent from the data submitted, the primary excavation equipment causing damages is hoe/trencher. Conversely, notification issues causing underground utility damages has been increasing since 2017, mostly due to no call being made to Ontario One Call prior to excavation activity (39% of damages).

With ORCGA's recent focus and efforts to identify and resolve the issue of late locates in Ontario, it is apparent that excavators are quite likely digging without locates.

Clearly, there is much work ahead to educate excavators on safe digging practices and the need to Call or Click before you dig.

The 2019 DIRT Report is the result of the dedicated volunteers on the ORCGA Reporting and Evaluation Committee, led by Co-Chair Richard Durrer of Ontario One Call.

On behalf of the ORCGA Board of Directors, I would like to extend a sincere thank you to the Reporting and Evaluation Committee for ensuring that the 2019 DIRT Report was accessible on the ORCGA website, as well as being distributed to all members before April 1st, the start of the 2020 Dig Season.

The Ontario Regional Common Ground Alliance (ORCGA) is a non-profit organization that is working towards effectively eliminating damages to underground infrastructure through influential advocacy, meaningful education and impactful engagement and is also leading Ontario to enhance safety through the collaborative prevention of damage to underground infrastructure.

The ORCGA is a growing organization with over 500 active members and sponsors representing a wide cross section of stakeholders:

Electrical Distribution
Electrical Transmission
Engineering Equipment & Suppliers
Excavator
Homebuilder
Insurance
Land Surveying
Landscape/Fencing
Locator
Municipal & Public Works
Oil & Gas Distribution
One Call
Railways
Regulator
Road Builders Safety Organization
Telecommunications Transmission
Pipeline

The ORCGA works to foster an environment of safety throughout Ontario for all workers and the public. This is accomplished by offering practical tools while promoting public awareness and compliance of best practices in regards to underground infrastructure and ground disturbance practices.

The ORCGA welcomes open participation and new members on its various committees. In order to submit a suggestion, or to join a meeting, please visit www.orcga.com to learn about the scope of the various committees.

General inquiries about the ORCGA can be made to:

Ontario Regional Common Ground Alliance (ORCGA)
545 North Rivermede Road, Unit 102
Concord, ON L4K 4H1
Telephone: (905) 532-9836
Toll Free: (866) 446-4493
Email: office@ORCGA.com

To learn more about the ORCGA's Dig Safe Program, visit www.digsafe.ca.

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1.1 Reporting and Evaluation Committee Recommendations

#1 Excavation Practices Not Sufficient

Excavation Practices Not Sufficient continues to be a large cause of the events. This is when the Excavator notified the One Call centre to have underground utilities marked, but an event still occurred due to the lack of careful excavation practices, such as:

- Excavator failed to maintain clearance after verifying marks
- Marks faded or not maintained
- Excavator dug prior to verifying marks by test-hole (pot-hole)
- Excavator failed to protect/shore/support facilities
- Failure to use hand tools where required

Although 2019 has a seen a decrease in this category overall, emphasis should be made to reduce events due to Excavation Practices Not Sufficient. Targeted outreach and educational information should be provided to excavators to reduce events resulting from this root cause. A particular focus should be placed on the Construction Industry due to the continuous increase in their events.

#2 No Notification to One Call Centre

No Locates remains a significant issue as there has been an observed increase in the number of No Locate events in the last 4 years.

This must be addressed as a primary focus of ORCGA education efforts within 2020 and subsequent future campaigns. Successes in this area have occurred from Dig Safe efforts but these efforts need to be reinforced and strengthened.

Particular focus should be placed on Dig Safe messaging to geographic areas which show abnormally high percentages of No Locate events (Figure 3).

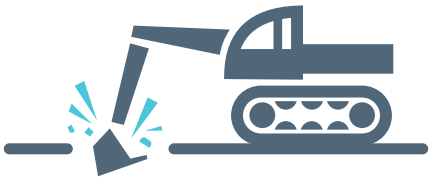
Did You Know?

There were 4940 reported damages in 2019?

There were **20** damages per working day in Ontario.

The cost of damages is estimated to be over **$1B** per year in Ontario.

41% of damages are due to improper excavation practices?



Amount of damages with and without locates:

✓ **64%**
× **36%**

At peak in 2019, **186K** notifications per week were sent to members for locating.

1.2 Data

The Damage Information Reporting Tool (DIRT) is the result of the efforts made by the ORCGA to gather meaningful data about the occurrence of facility events. An "event" is defined by the DIRT User's Guide as "the occurrence of downtime, damages, and near misses." Gathering information about these types of events gives the ORCGA the opportunity to analyze the contributing factors and recurring trends. This allows the ORCGA to identify potential educational opportunities to meet our overall goals of reducing damages and increasing safety for all stakeholders.

The annual DIRT Report provides a summary and analysis of the known events submitted during the prior year, and as additional years of data are collected, it also provides the ability to monitor trends over time. The 2019 report focuses on the data gathered throughout Ontario during the three-year period between 2017 and 2019. This data can be helpful for all stakeholders to use as a benchmark for their damage prevention performance. It identifies current issues facing the industry, region and province.

Data Analysis Disclaimer: Industry stakeholders have voluntarily submitted their underground facility event data into DIRT. The data submitted is not inclusive of all facility events that occurred during the reporting year as it represents only the information voluntarily submitted by industry stakeholders.

The information presented in this report is based on current information provided to the ORCGA for events that occurred, or were updated, in 2019.

When reviewing statistics published in this report, it is important to note that contributors do retroactive submissions for the three year period. This will cause the volume of facility events submitted by year to change in each report. **It is also important to note as of January 1st, 2018, a new data standard for the DIRT Form was implemented alongside the current. 2018 data could be submitted under the new standard, but was not required. Due to the variances between the 2018 format and the legacy formats, we have moved forward and standardized to the 2018 while mapping legacy to the 2018 standard root causes and sub causes. This will continue until the 2020 DIRT Report, at which time, the legacy data will no longer be used.**

In addition to the number of events submitted, an important factor is the completion of the associated information which allows for better overall analysis of the contributing factors. Each submitted record contains numerous data elements that are vital to understanding and interpreting the incidents reported in DIRT. It is important that stakeholders align their data collection and reporting practices with those found on the DIRT Field Form.

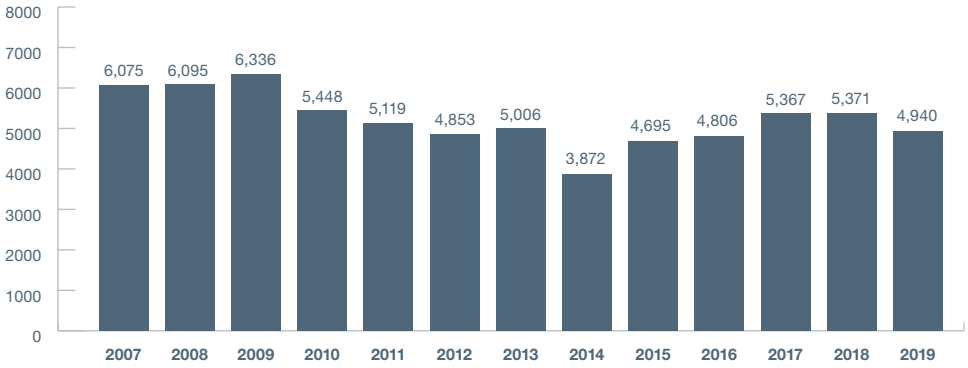
To gauge the overall level of completion of records submitted, the Data Quality Index (DQI) was implemented in 2009. This provides DIRT contributors a way to review the quality of the facility event records they submit.

When reviewing the statistics published in this report, it is important to note that only events with complete data were included; records with missing data were removed from the analysis.

2.1 Facility Event Analysis

In 2019, facility events saw an overall decrease of 8% over 2018. We will break out incidents to gain insight on where attention and efforts are to be made to continue reducing damages in the future.

Figure 1: Facility Events Submitted by Year



Underground infrastructure damages have societal costs that go well beyond the direct cost of repairs.

Direct Costs arise from repairing the damage and are related to the:

- Costs of replacement materials used; and,
- Labour and administrative costs.

Indirect Costs arise from the damage and its economic assessment of all resulting disruptions. They are varied and can cover a wide range of areas, such as:

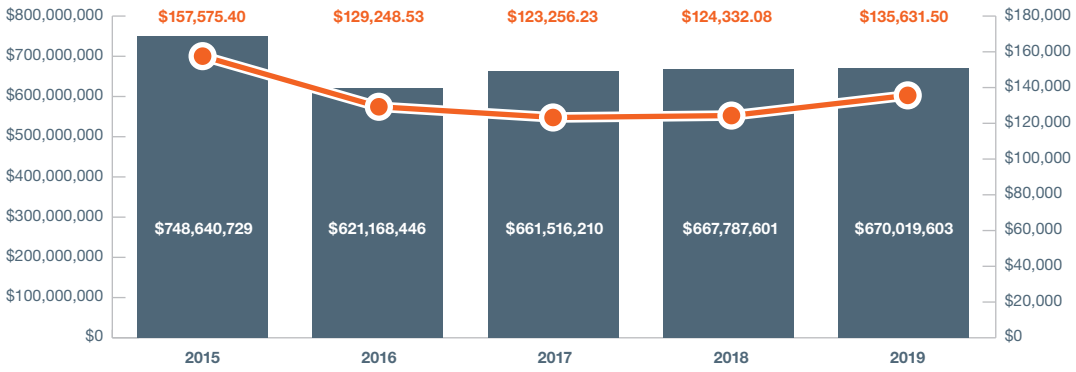
- Service disruption following damages to infrastructure;
- Intervention of emergency services;
- Economic impact on businesses and companies;
- Work delays;
- Traffic disturbances; and,
- And many more.

Indirect costs are difficult to quantify and rarely considered when making decisions related to excavation work or damage prevention.

This figure shows Ontario data only and is extremely understated and may only be 10-15% of actual costs.

In 2019, Socio-Economic cost the province of Ontario a total $670M+, and the average cost per incident totalled $135K.

Figure 2: Socio-Economic Cost of Incidents



CIRANO, Socio-Economic Costs Assessment Tool Regarding Damages To Underground Infrastructure, Feb. 14 ,2020, https://cirano.shinyapps.io/shiny/

■ Socio-Economic Cost / ■ Avg. cost per incident

2.2 Facility Events Submitted Across Ontario

Table 1 outlines the ORCGA geographic areas and the constituent municipalities/cities.

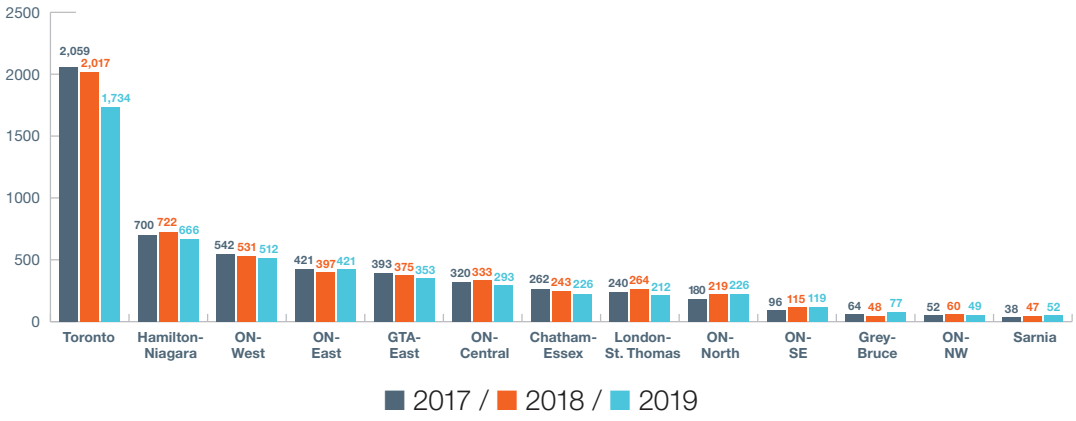
Table 1: Geographic Area Breakdown by Region/Municipality/City

Geographic Area	Cities
Chatham-Essex	Chatham-Kent, Essex
Grey-Bruce	Bruce, Grey
GTA-East	Durham, Kawartha Lakes, Northumberland, Peterborough
Hamilton-Niagara	Haldimand, Halton, Hamilton-Wentworth, Niagara, Norfolk
London-St. Thomas	Elgin, Middlesex
ON-Central	Dufferin, Simcoe
ON-East	Akwesasne, Lanark, Ottawa, Prescott & Russell, Renfrew, Stormant, Dundas & Glengarry
ON-North	Algoma, Cochrane, Greater Sudbury, Haliburton, Manitoulin, Muskoka, Nipissing, Sudbury, Temiscamingue, Timiskaming
ON-Northwest	Kenora, Rainy River, Thunder Bay
ON-Southeast	Frontenac, Hastings, Leeds & Grenville, Lennox & Addington, Prince Edward
ON-West	Brant, Huron, Oxford, Perth, Waterloo, Wellington
Sarnia	Lambton
Toronto	Peel, Toronto, York

Figure 3 illustrates the number of events for each geographic area over the past three years.

While there have been fluctuations, the majority of Geographic Councils are seeing a downward trend in events. On a positive note, Toronto's incidents continue to show a downward trend by 14%. The increase in the ON North area could be attributed to increased capital projects for pipeline and Fibre to the Home.

Figure 3: Volume of Events Submitted Per Geographic Area



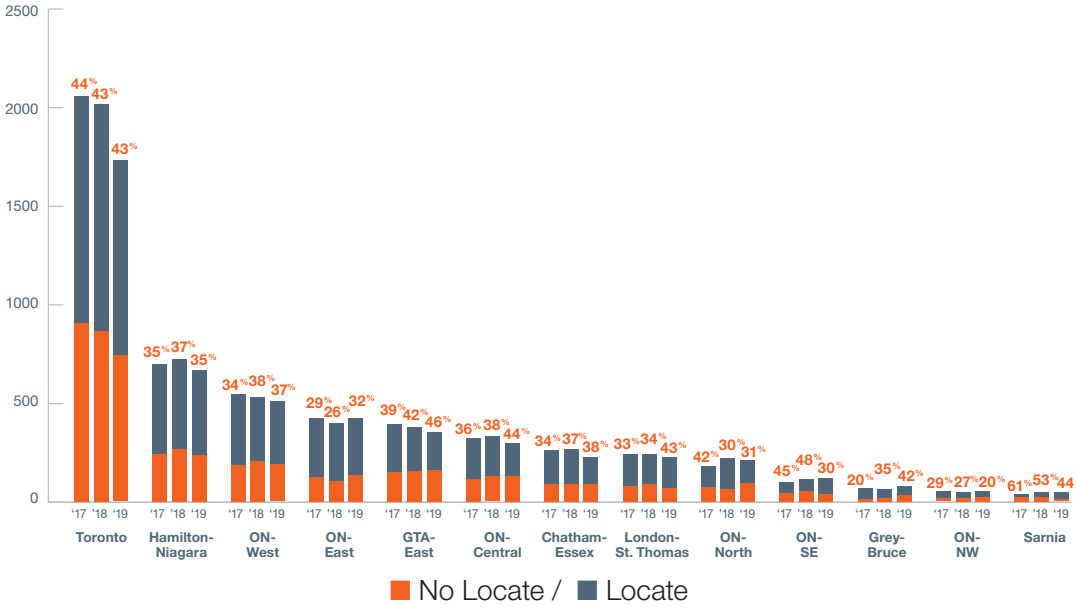
Notifications increased by 2% in 2019 due to economic activity.

Table 2: Notifications Per Geographic Council

Geographical Area	2017	2018	2019
Central	260,003	232,900	238,444
Chatham-Essex	295,231	279,196	294,729
East	620,086	628,130	655,543
Grey-Bruce	73,940	64,692	68,326
GTA-East	432,933	409,834	466,214
Hamilton-Niagara	1,025,378	886,727	924,656
London-St. Thomas	260,871	236,992	255,974
North	228,432	207,652	218,310
Northwest	74,359	68,907	71,846
Sarnia	98,112	83,041	84,192
Southeast	129,913	130,370	135,031
Toronto	2,705,414	2,356,341	2,266,423
West	573,568	516,517	547,539
GRAND TOTAL	**6,778,240**	**6,101,299**	**6,227,227**

Figure 4 illustrates the number of events in 2019 where Ontario One Call was notified for a locate request versus not being notified for a locate request, broken down by geographic area.

Figure 4: Locate Versus No Locate Events by Geographic Area

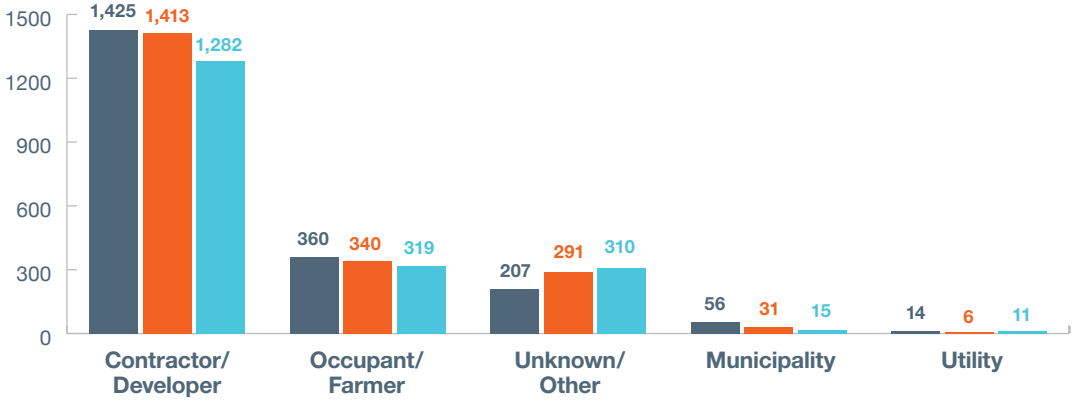


No Locate Damages by Excavator Type

Figure 5 provides further analysis on the categories of excavators that are not submitting locate requests.

Increased education should be targeted towards the Contractor/Developer who were responsible for 66% of the no locate damages in 2019.

Figure 5: No Locate Damages by Excavator Type | 2017 / 2018 / 2019



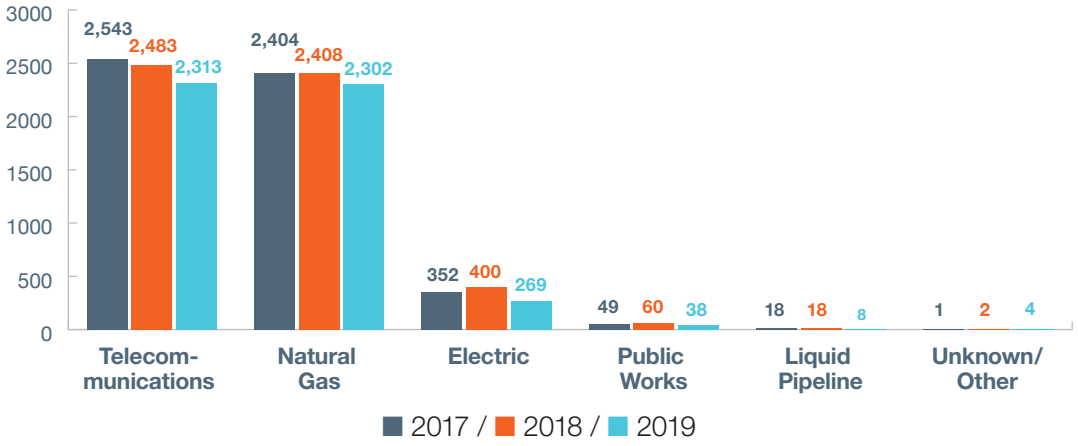
2.3 Submitted Facility Events by Stakeholder Group

Figure 6 illustrates a distribution of events by stakeholder group for the past three years.

Telecommunications and Natural Gas continue to submit the highest volume of events.

In order to support future trend analysis, additional stakeholders are encouraged to submit their events into DIRT.

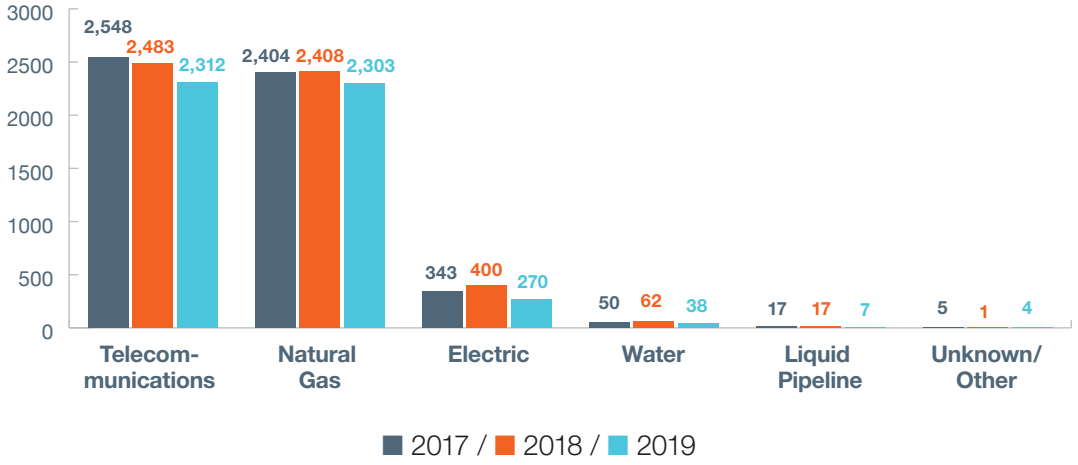
Figure 6: Facility Events Submitted by Stakeholder Group



2.4 Submitted Facility Events by Type of Facility Operation Affected

Figure 7 illustrates that Telecommunications and Natural Gas continue to be the primary facilities affected by events reported in DIRT. This aligns with the high volume of events that the Stakeholders continue to submit.

Figure 7: Submitted Facility Events by Type of Facility Affected



2.5 Volume of Events by Excavation Equipment Group

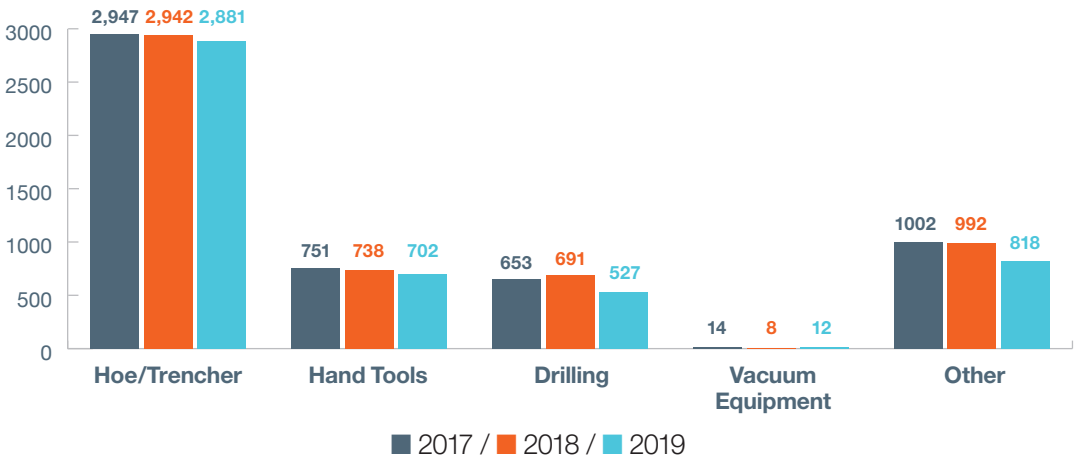
Table 3 outlines the types of excavation equipment included in each equipment group.

Table 3: List of Equipment Groups

Group	Excavation Equipment Type	
Hoe/Trencher	Backhoe/Trackhoe	Trencher
Hand Tools	Hand Tools	Probing Device
Drilling	Auger	Directional Drilling
	Boring	Drilling
Vacuum Equipment	Vacuum Equipment	
Other	Bulldozer	Grader/Scraper
	Data Not Collected	Milling Equipment
	Explosives	Other
	Farm Equipment	

Figure 8 illustrates a distribution of events caused by various groups of excavation equipment. In 2019 the Hoe/Trencher group continued to account for the largest volume of events. Submitters are encouraged to minimize listing equipment as 'other' in order to improve data accuracy.

Figure 8: Submitted Facility Events by Excavation Equipment Group



2.6 Facility Events By Root Cause

Table 4a details the Root Cause subcategories included in each main category.

Table 4a: Legacy Root Cause Category and Subcategory

Root Cause Category	Root Cause Subcategory	
Excavation Practices Not Sufficient	Failure to maintain the marks*	Failure to support exposed facilities*
	Failure to use hand tools where required***	Failure to verify location by test-hole (pot-holing)*
	Improper backfilling*	Other insufficient excavation practices*
	Failure to maintain clearance	
Locating Practices Not Sufficient*	Facility could not be found/located*	Facility marking or location not sufficient
	Facility was not located or marked	Incorrect facility records/maps***
Miscellaneous Root Causes	Abandoned facility**	Data Not Collected***
	Deteriorated facility*	One-Call center error***
	One-Call notification center error*	Other***
	Previous damage*	
One Call Notification Practices Not Sufficient*	"No notification made to the one-call center*"	Notification to one-call center made but not sufficient
	Wrong information provided*	

* indicates Category\Subcategory change in 2018; ** Moved to Locating Issue; *** Deleted from Report

Table 4b denotes the new data standard for the 2018 DIRT Form which has been implemented alongside Table 4a.

Table 4b: 2018 Root Cause Category and Subcategory

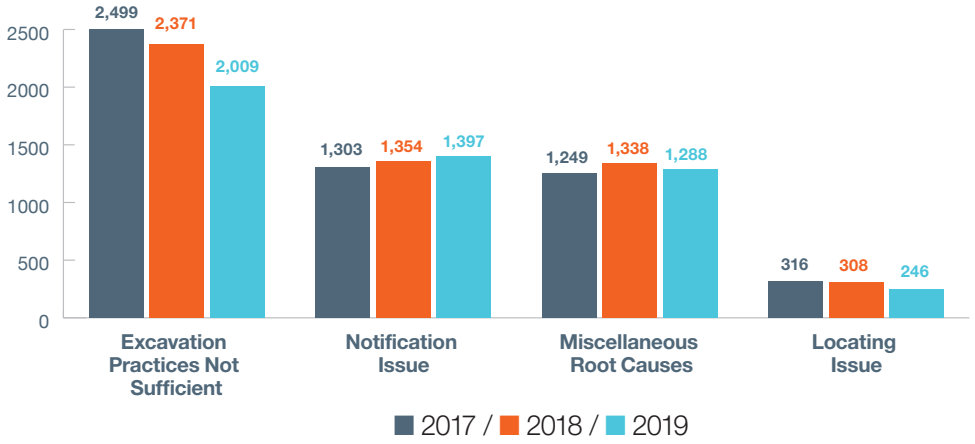
Root Cause Category	Root Cause Subcategory	
Excavation Practices Not Sufficient	Marks faded or not maintained	Excavator failed to protect/shore facilities
	Improper backfilling practices	Excavator dug prior to verifying marks by test-hole (pothole)
	Failure to maintain clearance	Improper excavation practice not listed above
Locating Issue	Facility not marked due to : Abandoned Facility	Facility not marked due to : Unlocatable Facility
	Facility not marked due to : Incorrect Facility records/maps	Facility marked inaccurately due to: Abandoned facility
	Facility not marked due to : Locator error+	Facility marked inaccurately due to: Incorrect facility records/maps
	Facility not marked due to : No response from Operator/contract locator+	Facility marked inaccurately due to: Locator error
	Facility not marked due to : Tracer wire issue+	Facility marked inaccurately due to: Tracer wire issue
Miscellaneous Root Causes	Deteriorated facility	Previous damage
	One-Call notification center error	Root Cause not listed (comment required)+
Notification Issue	No notification made to the one-call center/811	Excavator dug outside area described on ticket+
	Excavator provided incorrect notification information	Excavator dug prior to valid start date/time+
		Excavator dug after valid ticket expired+

+ New Category/Subcategory

As of 2018, these are the root causes and subcategories we will be using. In order to develop useful educational tools to improve the damage prevention performance in Ontario, it is important to examine the causes of reported events. To understand the most common reasons for facility events, the distribution of Root Cause subcategories will be examined on the following pages.

Figure 9 illustrates the distribution of events by Root Cause category. The most common causes of events are a result of Excavation Practices Not Sufficient. Although there has been a significant decrease in this category, emphasis should be made to continue to reduce events by providing targeted outreach and education to the excavator community.

Figure 9: Facility Events by Root Cause Category

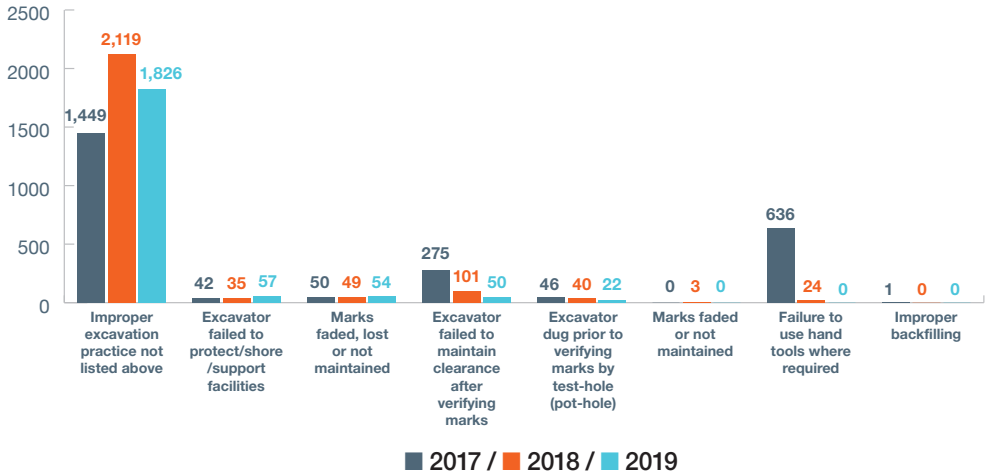


Due to the change from the Legacy to the 2018 standard, graphs may show fluctuations of incidents reported by Root Cause.

Figure 10 illustrates a 3 year breakdown of the Root Cause subcategories for Excavation Practices Not Sufficient. As seen below, Improper Excavation Practice Not Listed Above continues to be one of main issues. This Root Cause subcategory is defined as any other excavator error, which cannot be classified as one of the other six Root Cause subcategories within Excavation Practices Not Sufficient.

The next highest Root Cause subcategory is the failure to Protect/Shore/Support Facilities.

Figure 10: Facility Events by Excavation Practices Not Sufficient



Due to the change from the Legacy to the 2018 standard, graphs may show fluctuations of incidents reported by Root Cause.

Figure 11 illustrates a three year breakdown of the Root Cause subcategories for Notification Issues.

This figure illustrates the need to continuously increase excavator and general public awareness about requesting a locate before digging starts, as this number continues to increase.

Figure 11: Facility Events by Notification Issues

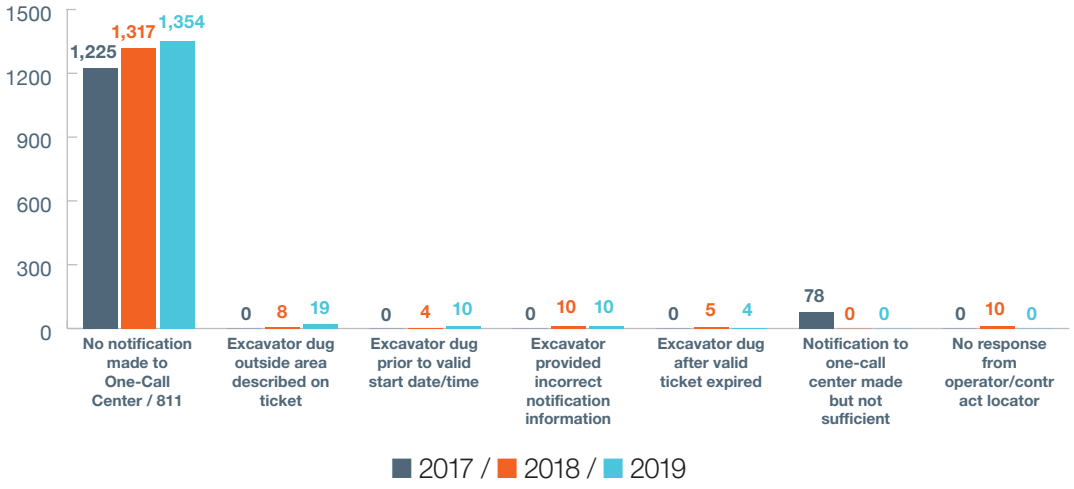


Figure 12 illustrates a three year breakdown of the Root Cause subcategories for Miscellaneous Root Causes.

The most prevalent Root Cause subcategory is Root Cause Not Listed Above, which in previous years was listed as Data Not Collected. Data Not Collected is not an option in the new DIRT data format.

Figure 12: Facility Events by Miscellaneous Root Causes

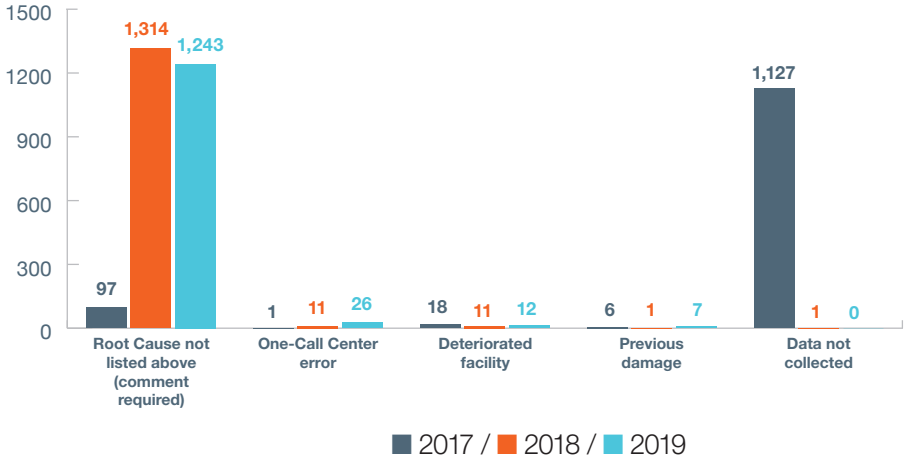
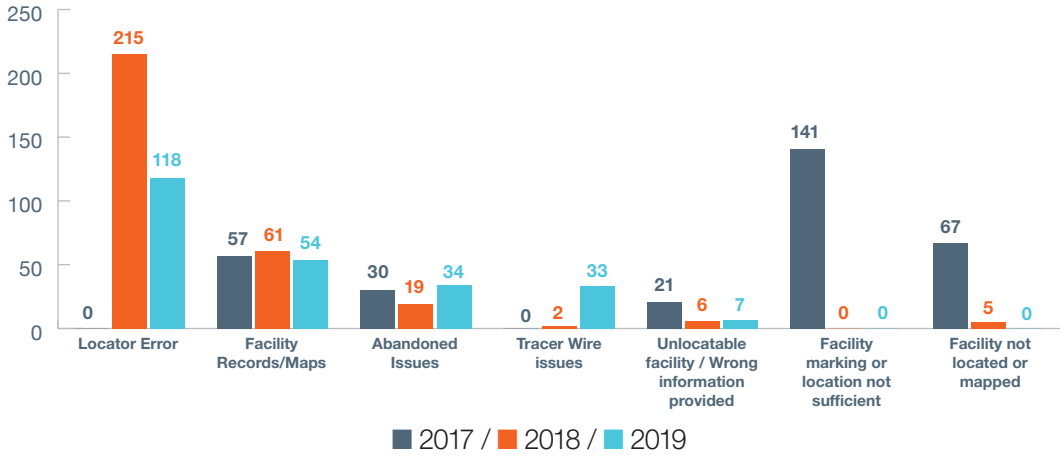


Figure 13 illustrates a three year breakdown of the Root Cause subcategories for Facility Events by Locating Issues. These subcategories were the most affected in the 2018 update of the DIRT Report with new subcategories added, as well as drill down of the old categories.

Figure 13: Facility Events by Locating Issues

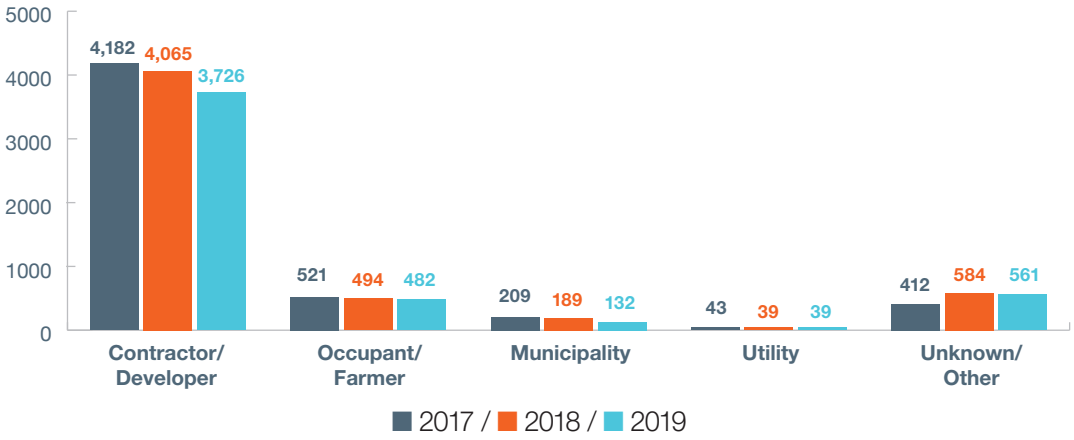


2.7 Facility Events by Excavator Group

Figure 14 illustrates the distribution of events by Type of Excavator showing that Contractor/Developer continues to be involved in the majority of reported events, although there has been a downward trend since 2017.

In order to develop useful educational tools to improve the damage prevention performance in Ontario, it is important to examine the parties causing reported events. Additional analysis of these groups is provided in the 3.0 Multi-Field Analysis section of this report.

Figure 14: Facility Events by Type of Excavator



2.8 Facility Events by Type of Work Performed

Figure 15 illustrates a distribution of events by Type of Work Performed. Construction continues to be a concern as the volume of events have shown a significant increase for the past two years. Construction has now become the primary type of work causing events. Sewer and Water has seen a significant reduction from 2017 to 2019.

Sewer & Water and Utility continue to be involved in the majority of events submitted but have seen a downward trend since 2017.

In order to improve data accuracy, submitters are encouraged to reduce the use of the Unknown/Other category.

Figure 15: Facility Events by Type of Work Performed

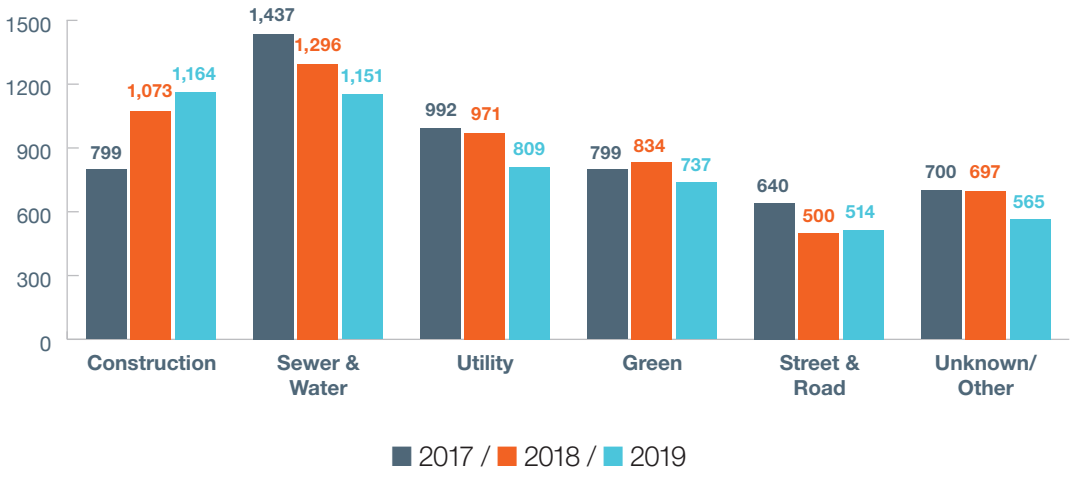


Table 5 illustrates a three year breakdown of the most common types of work performed. When broken down into identifiable sub groups, Building Construction has the highest volume of events in 2019 with 886 events, followed by with Water 715, followed by Fencing with 376 events. These work types take into account over one third of events and would provide the greatest impact in being reduced. Unknown/Other has the third highest volume of events in 2019; however it is not identified.

Table 5: List of Work Included in Each Work Group

GROUP & TYPE OF WORK	2017	2018	2019
Construction			
Bldg. Construction	545	831	886
Driveway	137	129	150
Site development	63	55	74
Grading	42	37	38
Bldg. Demolition	12	21	15
Green			
Fencing	437	483	376
Landscaping	344	341	345
Irrigation	12	8	7
Waterway Improvement	2	1	5
Agriculture	4	1	4
Sewer & Water			
Water	935	832	715
Sewer	337	284	248
Drainage	165	179	186
Sewer (Sanitary/Storm)		1	
Street & Road			
Road work	343	291	294
Storm Drain/Culvert	108	85	94
Curb/Sidewalk	116	82	73
Pole	34	11	26
Traffic Sign	16	6	10
Street light	16	9	8
Public Transit Authority	1	9	5
Traffic Signal	6	7	3
Utility			
Telecommunications	545	515	357
Electric	289	282	276
Cable TV	45	69	87
Natural Gas	113	105	82
Liquid Pipeline			5
Unknown / Other			
Unknown/Other	682	697	563
Engineering/Surveying	1		2
Data Not Collected	17		

3.1 Analysis of Root Cause and Facilities Affected by Types of Work

The following charts illustrate the known Root Causes of events for the six work groups of Construction, Sewer and Water, Utility, Green, Unknown/Other and Street & Road Work for 2017, 2018 and 2019.

Figure 16: Facility Events by Root Cause Group and Industry

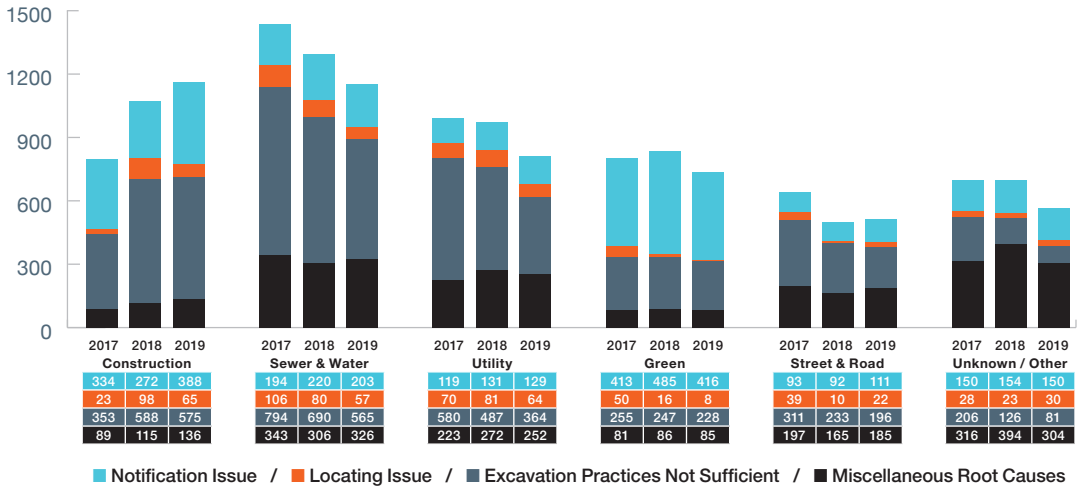


Figure 17 illustrates that the Contractor/Developer excavator type continues to represent the majority of events submitted under the Excavation Practices Not Sufficient category, and has seen a decrease in 2019.

Figure 17: Facility Events by Root Cause Category and Excavator Type

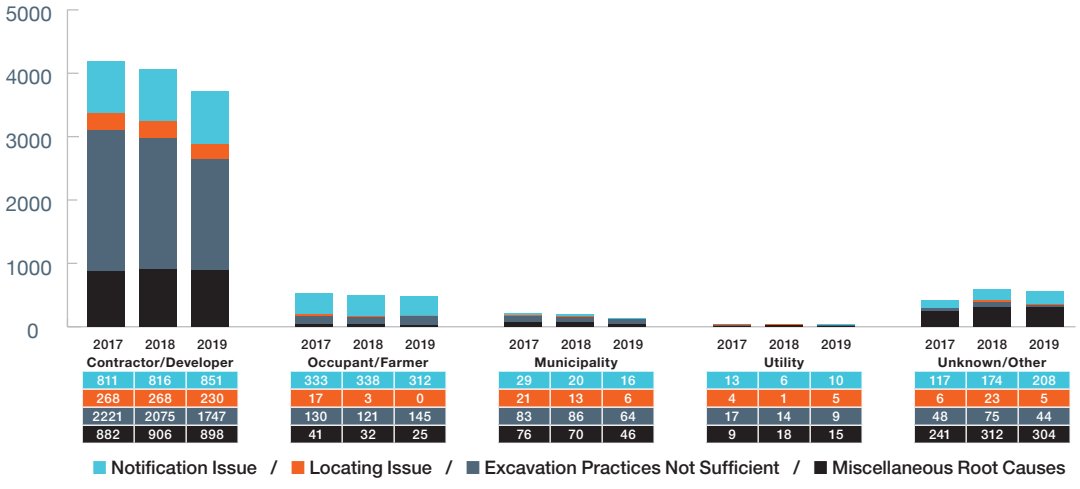
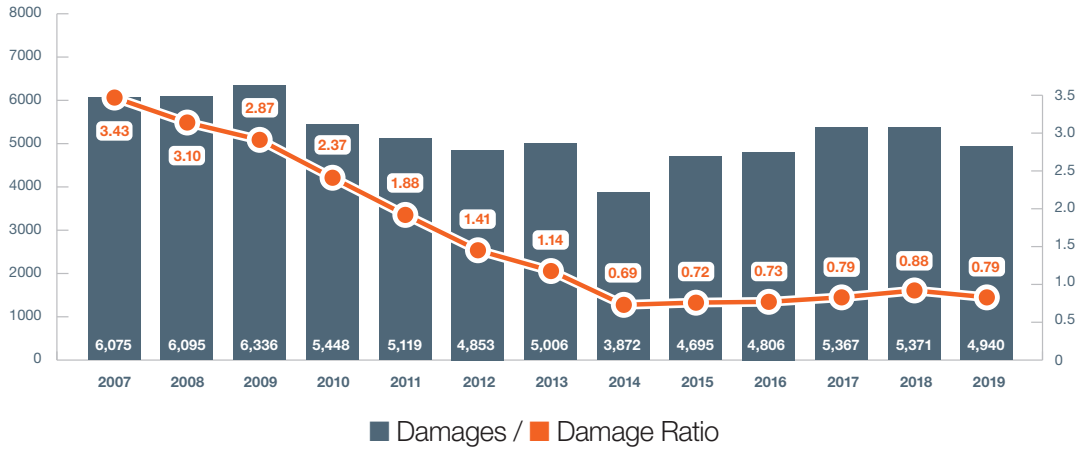


Figure 18 illustrates the damage ratio relative to the volume of events over the past 13 years. Industry practice is to measure damage prevention performance by the volume of damages per thousand notifications.

Due to a change in Ontario One Call process in 2018, notifications have decreased which negatively affects the Damage Ratio.

Figure 18: Damage Ratio - Damages/1000 Notifications



In response to the Ontario One Call process changes, this new chart was created to show damages per 1000 requests as this has remained consistent and is driven by either public awareness or economic events.

Figure 19 illustrates that the 2018 Damage to Request ratio saw a decrease, reversing an upward trend from 2014. This trend continues in 2019.

Figure 19: Damages/1000 Requests

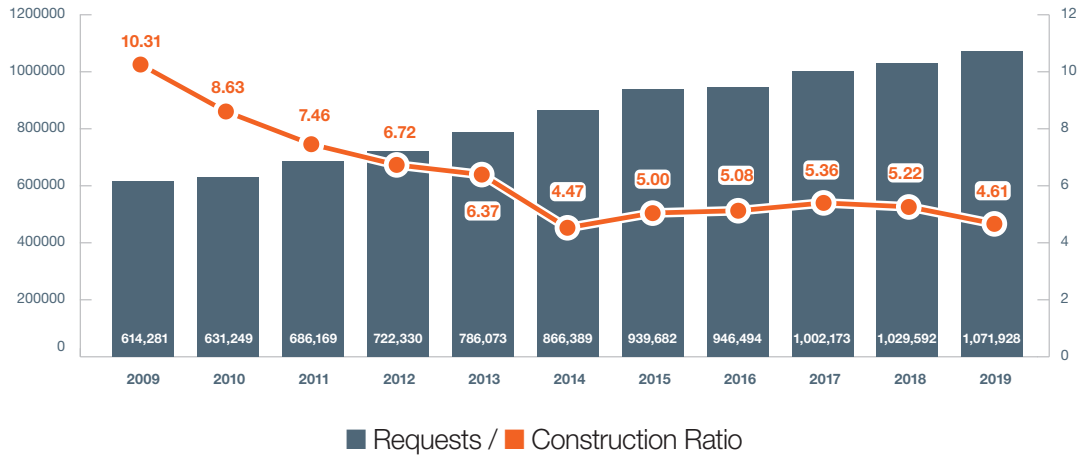


Figure 20 shows that although the peak of locate requests happen in May, the peak of damage incidents occur in August.

Figure 20: Damages by Month

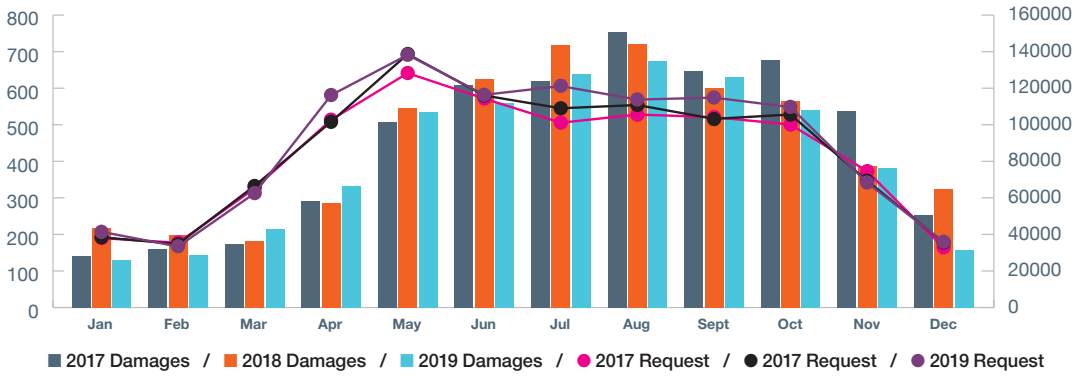
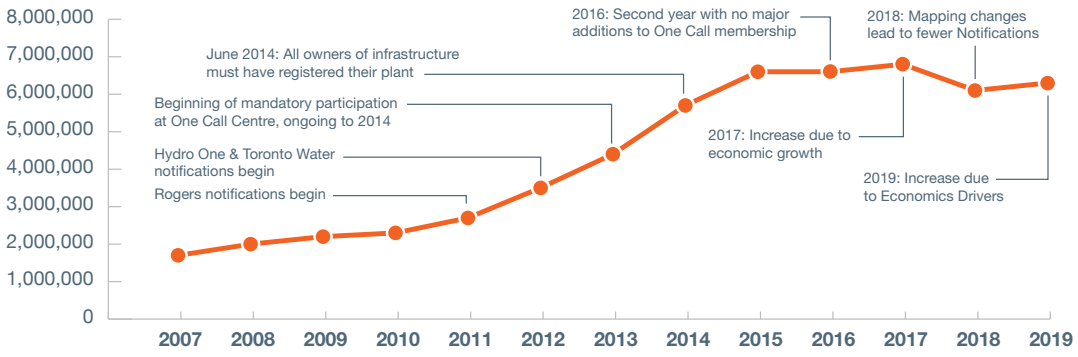


Figure 21 demonstrates that up until 2015, notifications rose significantly as major stakeholders became members of Ontario One Call.

Any further changes would be due to outside economic events.

Figure 21: History of Notifications



In 2018, the number of damages reported via DIRT for Canada totalled 11,693, which is 2.6% more than 2017.

Table 1 presents a summary of key performance indicators related to damages by province/region.

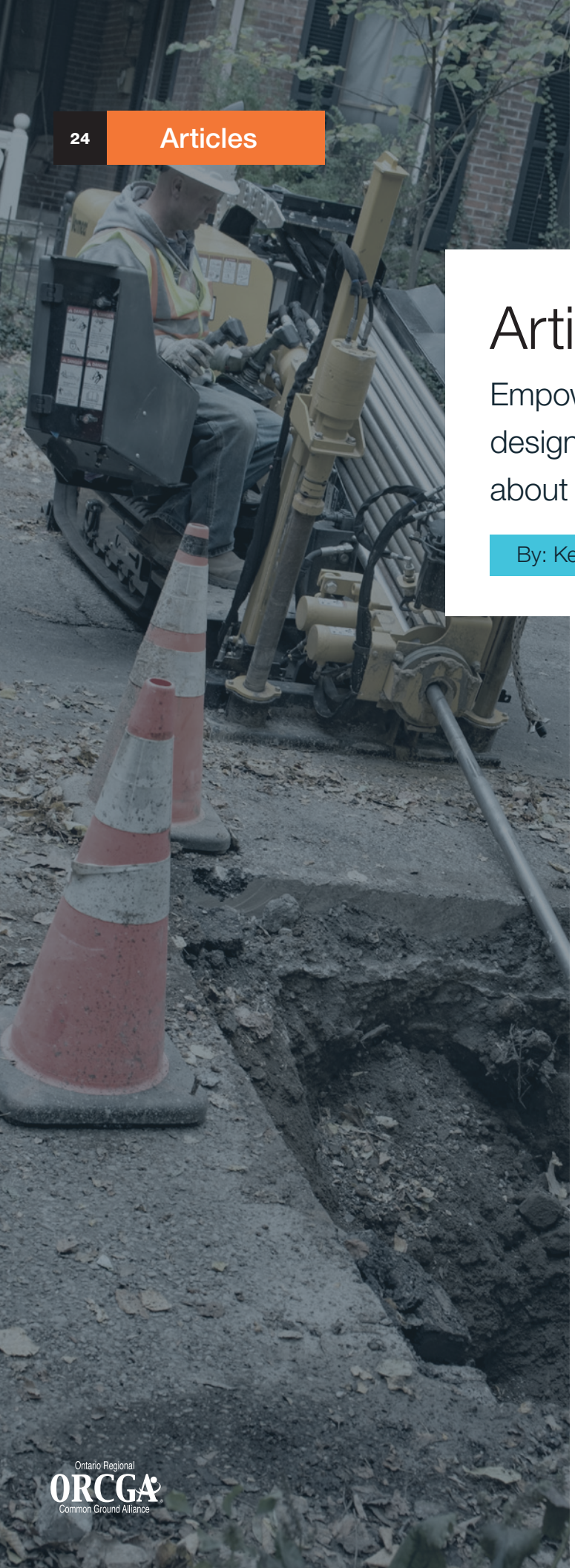
Canada-wide, there were on average 47 damages per work day (assuming 254 work days per year).

Table 1 - Damages, requests, notifications, by province/region, 2018

PROVINCE/ REGION	Damages	Damages per Work Day	Damage Ratio per 1,000 Locate Requests*	Damage Ratio per 1,000 Notifications**
British Columbia	1,414	6	9	2
Alberta	3,194	13	7	2
Saskatchewan	478	2	4	1
Manitoba	222	1	5	1
Ontario	5,077	20	5	2
Quebec	1,262	5	3	1
Atlantic	46	0.3	1	1
Canada	**11,693**	**47**	**5**	**1**

* Locate request is defined as 'communication between an excavator and a staff member of a One-Call Centre in which a request for locating underground facilities is processed.

** Notifications take place when a One-Call Centre transmits locate requests to their member facility operators. Each incoming notice of intent to excavate will generate several notifications to the electric, gas, water, sewer, cable TV, telecommunications, etc.



Article 1

Empowering safe construction and sound design – here's what you need to know about Subsurface Utility Engineering (SUE)

By: Kevin Vine, President, multiVIEW Locates Inc.

2018 brought with it a demanding construction season, and contractors across the province expect to grind out even more work this year, according to the Ontario Construction Secretariat's 2019 Contractor Survey. More than 30 per cent of non-residential contractors forecast a busier 2019 compared to last year, combined with population gains, reduced trade uncertainty and infrastructure spending.

More and more, medium-large scale construction projects are implementing the practice of Subsurface Utility Engineering (SUE) at the design phase to reduce risk and save on long term costs. Subsurface Utility Engineering (SUE) is an engineering practice that makes it possible to more accurately establish the location of buried utilities within a project area. This provides a foundation for decision-making around construction design, allowing a designer to make important decisions related to utility coordination, utility accommodation and utility relocation at the outset.

How does SUE reduce risk and prevent damage to underground infrastructure?

There are a number of ways that Subsurface Utility Engineering cuts project risk, minimizes damage to underground infrastructure and eliminates surprises at later stages of a project, and these significant

gains have been affirmed by several studies. For example, the Ontario Sewer and Watermain Contractors Association, in collaboration with the University of Toronto, commissioned a study that determined for each dollar spent on Subsurface Utility Engineering (SUE) for construction projects, $3.41 was saved.

A Subsurface Utility Engineering program provides a mechanism to accurately map both the horizontal and vertical position of buried underground assets, providing the information necessary to avoid utility strikes. When Subsurface Utility Engineering is applied prior to construction, the need for field verification diminishes as both the horizontal and vertical component of a buried utility is provided to the contractor or engineer by the SUE provider. In addition to avoiding utility strikes, this enables informed decision making so that unexpected utility coordination and relocation activities can be avoided at later stages of the project.

Furthermore, where utility records exist for a project area, they may be outdated or contain inconsistencies, and there's always a risk of additional utilities existing in the area that do not appear on the records. Carrying out the four quality levels of a Subsurface Utility Engineering program provides a mechanism to fill in data gaps in utility records so there are no surprises. Once a SUE investigation is complete, a utility conflict matrix is created that highlights any data inconsistencies and calls for further investigation where required.

What exactly comprises a SUE program?

SUE is based on the CI/ASCE 38-02 Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, which provides a framework for evaluating the integrity of data based on four Quality Levels:

Quality Level D (QL-D): Information derived from existing records or oral recollections.

Quality Level C (QL-C): Information obtained by surveying and plotting visible above-ground utility features and using professional judgment to correlate this information with the results of QL-D.

Quality Level B (QL-B): The application of surface geophysical methods to determine the existence and horizontal position of subsurface utilities within a project's limits. Non-destructive technologies including Ground Penetrating Radar (GPR) and Electromagnetic (EM) tools are leveraged at this stage to accurately detect conductive and non-conductive underground assets.

Quality Level A (QL-A): Also known as daylighting, QL-A provides the precise horizontal and vertical location of utilities along with type, size, condition and material, obtained by exposing the utility, usually through vacuum excavation.

Do I need to apply all four Quality Levels?

Where a topographic survey exists that was recently completed by an engineer or Ontario Land Surveyor (OLS), QL-C can typically be considered complete as surface utility data is captured during the topographic survey. Topographic surveys and base plans should always be supplied to the SUE service provider at the project kick off meeting. The service provider will then correlate the topographic survey with information collected at the QL-D stage, to develop a starting point for the field investigation. Insights gleaned from combining these two datasets will allow the investigation to be targeted and precise.

What is most important is that Quality Levels be carried out in their prescribed order – QL-D, QL-C, QL-B, QL-A. This is the most effective strategy for minimizing risk and avoiding rework. QL-D and QL-C should be applied to the entire project area including areas not expected to be affected by future construction, (e.g., temporary staging areas) whereas QL-B can be targeted to the impacted area. QL-A investigations are required when depth data or precise horizontal location must be obtained to achieve project goals. QL-A should

also be considered when the results of a QL-B investigation appear to be conflicting with existing utility records in key project areas.

How do I customize a SUE program for my specific requirements?

The SUE scope of work can vary greatly from project to project, and there are some key considerations for defining the scope of work. Ask these questions at the outset, and you'll be able to tailor a SUE program to your project-specific requirements.

1. What are the potential project risks associated with utility location information? Will utilities be involved directly or indirectly with the project?
2. What level of utility information should be obtained to adequately manage risks such as project cost overruns, construction and design delays, stakeholder impact, etc.?
3. At a project level, is there evidence to suggest the presence of buried objects or subsurface infrastructure?
4. Do the existing records contain inconsistencies? Is there evidence of additional utilities or buried structures not on record?
5. If utilities are not in the exact location as shown on the records, what risk might this pose to the project?
6. Will the project involve excavation and if so, what is the depth?
7. Is information on the vertical position (depth) of subsurface utilities or buried structures required to minimize risk or will information on the horizontal position suffice?
8. Is the project high risk for utility conflicts with existing or future utilities? e.g., new bridge construction or bridge widenings where footings are placed; projects involving daylighted utilities that will clearly conflict and require rework; excavation projects, particularly tunnel/grade separations where there is a conflict.

What should I think about in terms of schedule?

There are several factors that can affect the SUE schedule which should be considered in relation to your project's overall timeline. Examples of these factors include:

- Requesting data acquisition activities that reside outside the scope of SUE which may result in project delays. For example, chamber investigations may require traffic control, night work, special permits and on-duty police scheduling and fees.
- Other activities occurring on the project site, for example, topographical surveying, geotechnical or environmental assessments. Be sure to assess subcontractor project schedules for potential site access conflicts.
- The location of the SUE investigation. If the investigation occurs within a rail or congested vehicle corridor, traffic control and closures may be required. If, however, the investigation is related to a boulevard or private construction land, there will be far fewer time constraints.
- The time required to review QL-B data, and schedule test pits. Determining the necessity, quantity and location of test pits usually occurs after reviewing the completed QL-B investigation and subsequent CAD utility drawing.

What technology should be applied?

The CI/ASCE 38-02 Standard stipulates that "appropriate geophysical methods" be leveraged to carry out the Quality Level B aspect of a SUE program. As this is a generic statement, there is room for interpretation. The geophysical method that is primarily leveraged to carry out the Quality Level B aspect of a SUE program is Electromagnetic (EM) Induction – otherwise known as pipe and cable locating. This technique is

extremely effective at locating utilities comprised of electrically conductive material or those that contain an intact tracer wire.

When data collected at the QL-D and QL-C stages of a SUE program reveals a likeliness that non-conductive utilities reside on the project site, such as concrete or plastic pipes, buried trunk sewers, etc., other methods can be leveraged to supplement the SUE scope of work such as Ground Penetrating Radar (GPR) which is highly effective at locating non-conductive buried assets.

What deliverables should I expect?

SUE deliverable formats can vary greatly based on project specifications. Municipalities, for example, each have their own CAD standards, and CAD drawings are submitted through the municipality's quality checker: a software tool that scans the submitted drawings to ensure they comply with the requirements of these standards.

Considerations for deliverables will include: whether data is to be reflected on separate layers or a single layer, labelling conventions, CAD software format (MicroStation or AutoCAD), digital submissions vs. hard copy, colour conventions, etc. The SUE report format may also vary based on whether the Project Manager desires photographs of test pits, test pit sketches, field sketches of utility locations, etc. When it comes to SUE deliverables, there's a lot of room for customization to meet the unique needs of the project. Having said that, deliverables should always be overseen and stamped by a Professional Engineer.

What should I look for in a SUE service provider?

The right certifications. SUE service providers must have a Certificate of Authorization from the Association of Professional Engineers of Ontario (PEO). As SUE involves geophysical activities, it is recommended, but not mandatory, that the service provider also have a Certificate of Authorization from the Association of Professional Geoscientists of Ontario (APGO). A Professional Engineer is required to approve, sign and seal SUE deliverables and a Professional Geoscientist oversees geophysical activities that comprise the SUE scope of work, for example, the application of Ground Penetrating Radar (GPR) and subsequent analysis of GPR data.

Relevant experience. SUE service providers should have experience locating all utility types required within the impacted area and also have verifiable experience completing projects of similar size and scope. Expertise in a range of technologies is required – Electromagnetic Induction, Ground Penetrating Radar (GPR), sonding, surveying, Global Positioning Systems (GPS), Geographic Information Systems (GIS), etc. Certifications to look out for include Damage Prevention Technician (DPT) certification, and relevant safety certifications including First Aid, WHMIS, Confined Space Entry (CSE), Confined Space Rescue, and Working at Heights, to name a few.

Advanced experience with Ground Penetrating Radar and related technologies. Where non-conductive utilities and features are believed to be within the project area, such as plastic, fiber optic, cable TV lines, water and concrete sewer lines, foundations, ducts and chambers, expertise in the application of Ground Penetrating Radar is key. GPR data can yield a cross section of subsurface utilities and can also be depicted three dimensionally, providing data on the actual depth of utilities.

The ability to innovate when challenges arise. As SUE projects vary greatly in size and scope, unique and unexpected challenges can arise. Many variables can affect the ability to collect data such as broken tracer wires, soil conductivity, or the presence of water that makes it difficult to achieve a signal. It's important to partner with a service provider that has experienced these challenges before and can innovate to overcome them.

Article 2

The Consequences of an Insurance Claim on an Excavating Contractor

Contractors that perform any type of excavating or underground services, large or small, have likely felt the sting of increased rates imposed by their Insurance Company. What makes this class of construction *that much riskier* to Insurers than others?

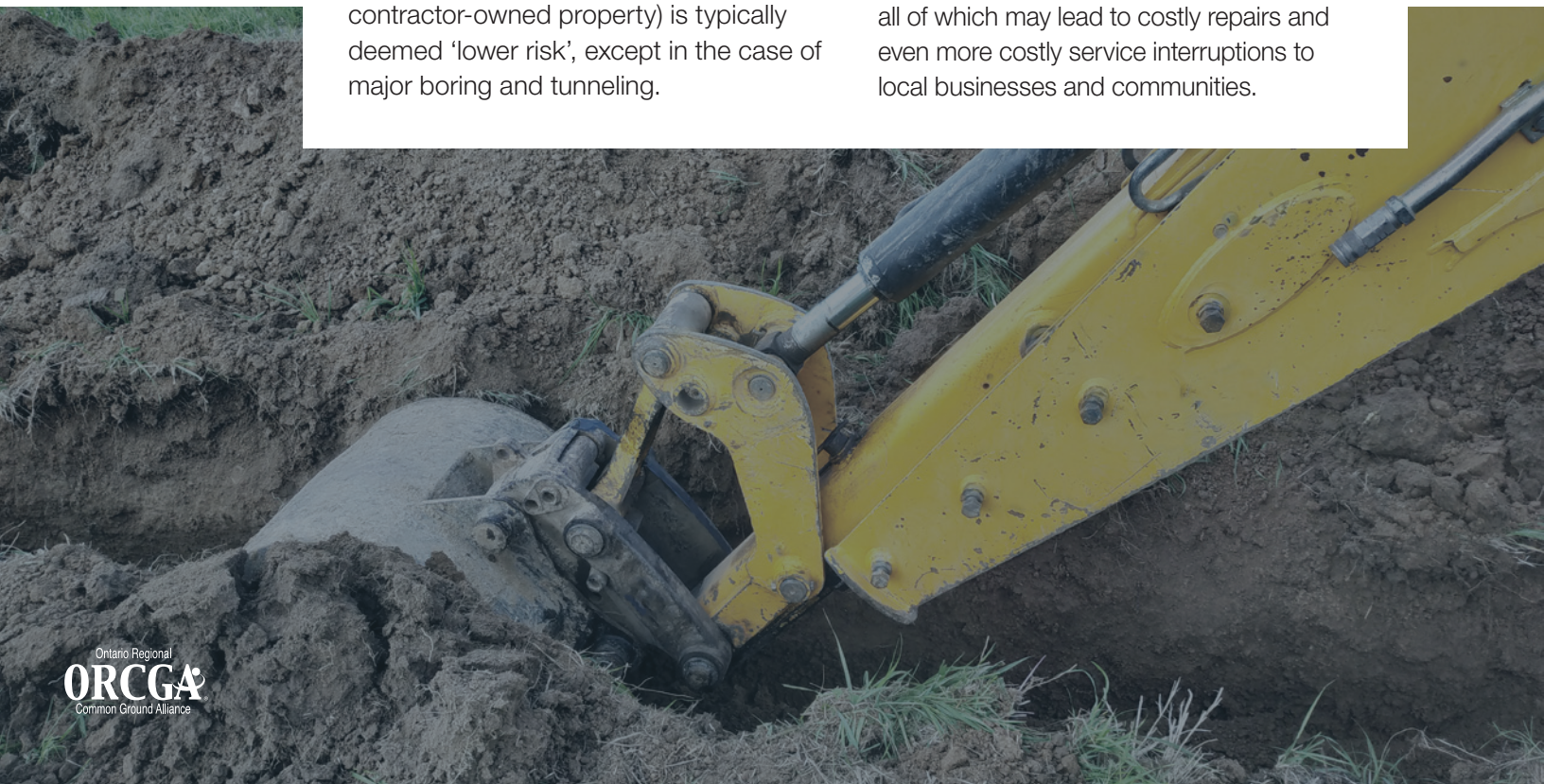
There are two major risks arising from underground and excavation work that contribute to higher risk exposures, and consequently higher insurance rates:

(1) First Party Bodily Injury and Property Damage ('BI & PD') and

(2) Third Party BI & PD.

The risk to the Insurer of First Party BI & PD is limited, since the former (i.e. injury to a worker) is attended to under provincial workers compensation acts, and the potential for the latter (i.e. damage to contractor-owned property) is typically deemed 'lower risk', except in the case of major boring and tunneling.

To the Insurer, the riskier aspect of any excavating-related work lies in liability for Third Party BI & PD. Aside from the common 'slip, trip, or fall' claim that might arise on a contractor's jobsite (the probability of which increases on urban jobsites), contractors face a host of increased third party exposures, such as injuring pedestrians, causing damage to adjacent neighbouring properties (such as sewer backup or water damage or cracked foundations), and striking utility lines (including electricity, sewer, water, gas, phone, fibre optic lines), all of which may lead to costly repairs and even more costly service interruptions to local businesses and communities.



How Does an Insurance Claim Affect such Contractors?

Take for example, a contractor, who makes an insurance claim after hitting an underground utility. This claim may cause damage to the contractor's reputation, and their rating with the municipality. It will likely cause delays that hinder the contractor's ability to meet the schedule, impacting the project profitability. The contractor will also inevitably become involved in the process of rectifying the damage, with their Insurance Company having to pay the better part of the bill.

Once the claim is settled, depending on its severity, the Insurer may have a list of recommendations for the contractor in order to minimize the probability of a similar claim arising in the future. In some cases, the insurer may deem the contractor's operations higher risk then originally underwritten, and respond by increase the rates, or restricting coverage, or refusing to offer renewal.

Availability of Insurance for Excavating, Directional Drilling & Sewer & Watermain Contractors

After witnessing the increased frequency and severity of claims that occur within the industry, the insurance market has become wary of the potential consequences related to insuring contractors that perform these services. Some insurers have gone a step further and elected to shy away from this class of construction altogether.

When the supply of Insurance Companies offering coverage decreases, and the demand for insurance coverage from excavating contractors either remains constant (or increases, as new participants enter the industry) insurance rates are pushed up, to reflect these circumstances.

The reduced supply of Insurers offering coverage also means Insurance Companies can use this market dynamic to justify a more thorough examination of prospective clients, as well as existing ones. Typically, they will use this opportunity to probe for additional information related to the contractor's operations, as a means of providing them with a level of comfort to insure the risk.

What Do Insurance Companies Want to Know?

Given the inherent 'on-site' risks that come with excavating, insurers have attempted to underwrite and understand the causes of their claims and identify the most effective ways in which to mitigate them. Among the most cited concerns voiced by insurers relating to the underground contracting class are:

1. **Site Management:** safety around the worksites, including construction site barriers, signage, and other safety measures, such as directing the flow of traffic for both vehicles and pedestrians.
2. **Methods of Completion:** How is excavating performed? Hydro vac (preferred) or hand-digging, hard cuts, other methods.
3. **Type of Work: Retrofitting vs. New Installation** – particularly for sewer and watermain contractors, Insurance Companies surcharge work that involves retrofitting, or repairing existing infrastructure, due to their higher exposure compared to new, greenfield sites.
4. **Directional Drilling:** smaller scale boring under a roadway is distinguished from major tunnelling.
5. **Location of Work:** rural sites provide less third party exposure than those in urban areas other than first party losses, such as tool/equipment theft, which may be more susceptible.
6. **Locates:** understanding the responsibility of the locate company / municipality and contractor.
7. **Insurance experience:** 5-year loss history - history is a good indicator of the future.

8. **Experience of the Contractor:** industry reputation, number of years in business, list of previous projects completed enhances their credibility in the eyes of the underwriter.

The Recipe to Minimize the Chance of Loss:

The best way for contractors to minimize their likelihood of incurring a loss include:

1. Constructing an extensive site planning.
2. Holding pre-excavation meetings with experienced personnel and all field workers.
3. Ensuring that employees are properly trained about company rules and safety guidelines prior to commencing work.
4. Crafting and following an excavation safety plan.
5. Acquiring and maintaining valid locates prior to digging (as per legal requirements).
6. Conducting continuous site inspections to address hazards and provide necessary corrective action.
7. Using proper excavation equipment that is being regularly maintained, and using hydro-vac, or hand-digging, whenever possible.
8. Contacting the utility company immediately if contact has been made with any utility.
9. Safely storing equipment and ensuring site is closed off/protected.

Who Holds the Cards?

There is no way to absolutely remove the risk of a jobsite claim. However, the best way to get Insurance Companies best terms is to provide them with the confidence that they currently maintain systems in place to reduce the probability of incurring a loss.

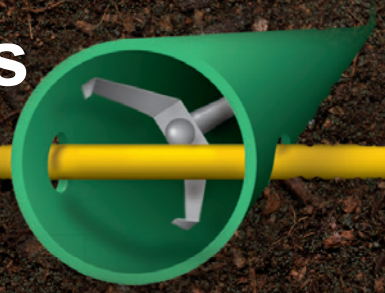
The next step for contractors who have good insurance terms already is to demonstrate that, not only do they employ best practices and have lower than average losses, but they are continuously working to develop new processes to identify risks and mitigate future losses.

In the current hard insurance market environment, the Insurers hold the cards, as diluted competition and increased losses across the board has resulted in coverages becoming more limited and pricing less competitive.

Any excavating contractor seeking comprehensive insurance coverage, or more competitive rates, can put themselves in a more favourable position if they have a competent insurance partner that is effective in demonstrating their competency within the field, and prove that they share the same interests with their insurer: to minimize the risk (i.e. claims) that arise from this class of construction. “It’s not about the cards you’re dealt, but how you play the hand”.

Petrela, Winter and Associates is a specialized insurance brokerage that has focused exclusively on providing surety bond, insurance and risk management services to the construction and development industries for over 40 years. Our singular focus on construction gives us a uniquely better understanding of the needs of contractors and enables us to deliver better solutions for our clients.

Natural Gas Sewer Safety Inspections



Natural gas pipelines installed using trenchless practices may have inadvertently penetrated sewer service lines.

Using motorized or water-jetting equipment to clear the sewer line can damage a natural gas line resulting in a gas leak, fire or explosion.

Before clearing a blocked sewer beyond the outside of a building, take the necessary precautions to protect yourself and others.

Always call Ontario One Call at 1-800-400-2255 to request a free Natural Gas Sewer Safety Inspection.

Enbridge Gas
Damage Prevention Department
1-866-922-3622
enbridgegas.com/sewersafety

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Article 3

Moving Towards Dig Safe in the Landscape Industry

Historically, the Landscape industry has been challenged when it comes to working around underground utility infrastructure.

Sean James, Chair of Landscape Ontario's Environmental Stewardship Committee, recently spoke with several Landscapers asking them to share their past damage stories and lessons learned from Landscapers performing excavation work during Dig Season.

Randy Tumber from Tumber International Landscape Training shared this story:

Years ago, prior to excavation on a residential property, I obtained utility locates, as required.

I then had a natural gas line strike. I was removing a basketball net mounting post by wrapping a chain around the post and using a hydraulic lift to extract the post in a straight lift-up. No problem, right? Wrong! It turns out that whoever originally installed the post must have stopped the auger right on the plastic gas line without compromising it. Then, when they poured the sono-tube full of concrete to install the post, the concrete encased the gas line. Consequently, when we extracted the basketball mount, it tore the gas line in half.

Thankfully, there were no worker injuries, equipment or property damages.

Overall, it was an expensive learning experience as the utility company billed me a substantial sum. As a result, we always hand dig within the tolerance distance indicated on the locate report, on either side of the utility locate markings.

Chris Clayton of Clayton Landscape Architects shared this story:

The landscaping company I worked for at the time, excavated a residential parking spot in the morning. A gas line was damaged, resulting in a leak.

The homeowners then returned home in the evening. Upon opening the front door, they could smell gas inside the home. Fortunately, the homeowners did not enter the home, as an explosion could have ignited from the many types of electrical appliances within the home, or even static electricity from their clothing! The homeowners shut the door and immediately called 911.

As a result of this damage, the homeowners spent two nights in the King Edward Hotel at my boss' expense!

Chris Clayton also recalled this story:

A Landscaper, performing excavation work, damaged a Bell fibre optic cable that cut off service to several home offices, home security alarms, and a babysitter's access to a landline phone.

Although this utility damage was serious, the contractor had done their due diligence and was able to produce a valid locate showing that the buried fibre optic cable was marked in the wrong place! The contractor avoided a $96,000 repair bill.

Chris Mace of Gelderman Landscape Services recounts:

Our company hit a residential gas line a couple of years ago. Fortunately, our staff on site were well trained and knew what to do in the event of a buried facility strike. Our crew leader contacted the gas utility owner and informed them of the damage.

Our crew leader then contacted his project manager, making sure that the workers, homeowner, and pedestrians were kept away from the damaged gas line. The homeowner was both understanding and calm, as the crew leader was knowledgeable in explaining the correct safety procedures.

Emergency services and the utility companies arrived on site, shut off the service and repaired the damaged gas line. Our company had to pay for the cost of the repair, approximately $5000.00.

Our Landscape company takes pride on being a professional organization and always acquiring utility locates prior to any excavation work. We wondered whether our reputation might have also taken a 'hit", with the homeowner. Fortunately, the homeowner was very understanding, as they knew we had all our safety procedures in place and did obtain a valid locate ahead of time.

Lastly, Chris recommended that all Landscape contractors should consider that:

- Work contracts should stipulate that the landscape contractor is responsible for getting all underground utility infrastructure located;
- Contractors must have liability insurance should any damages occur; and,
- Landscape designs may have to be modified to avoid facility damages.

EXCAVATOR OF THE YEAR AWARDS

ORCGA recognizes ongoing achievement in our industry through our Awards Program.

These awards recognize excavators with the best in-class safe digging practices. Excavator of the Year is determined by each contractor's individual damage rate. A damage rate is a calculation dependent on the volume of locates requests, measured against the number of digging related damages to underground infrastructure. Input from infrastructure owners is also used in the determination. To qualify, excavators must have a minimum of 500 locate requests to Ontario One Call.

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Appendix A:
Report Findings: Data Quality Index Indications

Table 6 indicates the Data Quality Index (DQI) for each individual part of the DIRT Field Form. The DQI is a measure of data quality and consists of the evaluation of each organization that submitted records, in addition to the evaluation of each record submitted to DIRT. The overall average DQI is 74.1%.

The weight assigned to the various DIRT parts varies based upon its value in analyzing the event for damage prevention purposes, with Root Cause receiving the largest weight. The overall DQI for a set of records can be obtained by averaging the individual DQI of each record. The "2019 DQI" column in the table below represents the average of all 4940 submitted events in the 2019 dataset.

Table 6: DIRT Submission Parts and DQI

DIRT Parts	Relative Weight	2017 DQI	2018 DQI	2019 DQI
A: Who is submitting this information?	5%	100.0	100.0	100.0
B: Date and Location of the event	12%	79.8	82.6	82.5
C: Affected Facility Information	12%	91.2	76.8	77.3
D: Excavation Information	14%	87.5	86.4	87.4
E&F: Notification, Locating, Marking	12%	90.6	78.6	80.8
G: Excavator Downtime	6%	17.6	31.7	32.3
H: Description of Damage	14%	35.1	47.9	49.0
I: Description of the Root Cause	25%	77.4	75.6	74.8
Total Weighted DQI	**100%**	**74.0**	**76.5**	**76.8**

Of the various parts of the damage report, Parts G: Excavator Downtime and H: Description of Damage are often not included, as most of the organizations inputting data into DIRT do not track this information.

FRESH DIRT (beginning 2018) Rev: 11/7/2017

'*' indicates a Required Field

Damage Information Reporting Tool (DIRT) - Field Form

Part A – Original Source of Event Information

Who is providing the information? ☐ Electric ☐ Engineer/Design ☐ Equipment Manufacturer
☐ Excavator ☐ Liquid Pipeline ☐ Locator ☐ Natural Gas ☐ Private Water
☐ Public Works ☐ Railroad ☐ Road Builders ☐ Federal / State Regulator
☐ Telecommunications ☐ Unknown/Other

Name of person providing the information:

Part B – Type, Date, and Location of Event

Type of Event: DIRT Event ☐ Underground Damage ☐ Underground Near Miss
Non-DIRT Event ☐ Above Grade ☐ Aerial ☐ Natural Cause ☐ Submarine

***Date of Event:** (MM/DD/YYYY)

***Country** ***State** ***County** **City**

Street address: **Nearest Intersection:**

Latitude/Longitude: Lat: Lon ☐ Decimal Degrees ☐ D M S

***Right-of-Way where event occurred**

Public: ☐ City Street ☐ State Highway ☐ County Road ☐ Interstate Highway ☐ Public-Other
Private: ☐ Private Business ☐ Private Land Owner ☐ Private Easement
☐ Pipeline ☐ Power /Transmission Line ☐ Dedicated Public Utility Easement
☐ Federal Land ☐ Railroad ☐ Unknown/Other

Part C – Affected Facility Information

***What type of facility operation was affected?** ☐ Cable Television ☐ Electric ☐ Liquid Pipeline
☐ Natural Gas ☐ Sewer ☐ Steam ☐ Telecommunications ☐ Water ☐ Unknown/Other

***What type of facility was affected?** ☐ Distribution ☐ Gathering ☐ Service/Drop ☐ Transmission ☐ Unknown/Other
Was the facility part of a joint trench? ☐ Yes ☐ No ☐ Unknown
Did this event involve a Cross Bore? ☐ Yes ☐ No
Was facility owner One Call Center member? ☐ Yes ☐ No ☐ Unknown
If No, is facility owner exempt from One Call Center membership? ☐ Yes ☐ No ☐ Unknown
Measured Depth From Grade ☐ Embedded in concrete/asphalt pavement ☐ <18" / 46 cm ☐ 18" – 36" / 46 - 91 cm ☐ >36" / 91 cm Measured depth from grade _____in/cm

Part D – Excavation Information

***Type of Excavator** ☐ Contractor ☐ County ☐ Developer ☐ Farmer ☐ Municipality
☐ Occupant ☐ Railroad ☐ State ☐ Utility ☐ Unknown/Other

***Type of Excavation Equipment** ☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Bulldozer
☐ Drilling ☐ Directional Drilling ☐ Explosives ☐ Farm Equipment ☐ Grader/Scraper ☐ Hand Tools
☐ Milling Equipment ☐ Probing Device ☐ Trencher ☐ Vacuum Equipment ☐ Unknown/Other

***Type of Work Performed** ☐ Agriculture ☐ Bldg. Construction ☐ Bldg. Demolition ☐ Cable Television
☐ Curb/Sidewalk ☐ Drainage ☐ Driveway ☐ Electric ☐ Engineering/Survey
☐ Fencing ☐ Grading ☐ Irrigation ☐ Landscaping ☐ Liquid Pipeline ☐ Milling
☐ Natural Gas ☐ Pole ☐ Public Transit Auth. ☐ Railroad ☐ Road Work ☐ Sewer
☐ Site Development ☐ Steam ☐ Storm Drain/Culvert ☐ Street Light ☐ Telecommunication
☐ Traffic Signal ☐ Traffic Sign ☐ Water ☐ Waterway Improvement ☐ Unknown/Other

Part E – Notification and Locating

***Was the One-Call Center notified?** ☐ Yes ☐ No Ticket Number

If Yes, type of locator ☐ Facility Owner ☐ Contract Locator ☐ Unknown/Other

If No, is excavation activity and/or excavator type exempt from notification? ☐ Yes ☐ No ☐ Unknown
Was work area white-lined? ☐ Yes ☐ No ☐ Unknown

Part F – Intentionally left blank

FRESH DIRT (beginning 2018)

Rev: 11/7/2017
'*' indicates a Required Field

Part G – Excavator Downtime

Did Excavator incur down time? ☐ Yes ☐ No

If yes, how much time? ☐ < 1 hr ☐ 1 -<2 hrs ☐ 2-<3 hrs ☐ 3+ hrs Exact Value _____ ☐ Unknown

Estimated cost of down time? ☐ $0 ☐ $1 -1000 ☐ $1,001 - 5,000 ☐ $5,001 - 25,000
☐ $25,001 - 50,000 ☐ >$50,000 Exact Value _____ ☐ Unknown

Part H – Interruption and Restoration

***Did the damage cause an interruption in service?** ☐ Yes ☐ No ☐ Unknown

If yes, duration of interruption ☐ < 1 hr ☐ 1 - <6 hrs ☐ 6 - <12 hrs ☐ 12 - <24 hrs ☐ 24 - <48 hrs
☐ 48+ hrs Exact Value _____hrs ☐ Unknown

Approximately how many customers were affected?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 - 10 ☐ 11 - 50 ☐ 51+ Exact Value _____

Estimated cost of damage / repair/restoration: ☐ $0 ☐ $1 - 1,000 ☐ $1,001- 5,000 ☐ $5,001 - 25,000
☐ $25,001 - 50,000 ☐ > $50,000 Exact Value _____ ☐ Unknown

*Part I – Root Cause Select only one

Notification Issue
- ☐ No notification made to One Call Center/ 811
- ☐ Excavator dug outside area described on ticket
- ☐ Excavator dug prior to valid start date/time
- ☐ Excavator dug after valid ticket expired
- ☐ Excavator provided incorrect notification information

Excavation Issue
- ☐ Excavator dug prior to verifying marks by test-hole (pothole)
- ☐ Excavator failed to maintain clearance after verifying marks
- ☐ Excavator failed to protect/shore support facilities
- ☐ Improper backfilling practices
- ☐ Marks faded or not maintained
- ☐ Improper excavation practice not listed above

Locating Issue

Facility not marked due to:
- ☐ Abandoned facility
- ☐ Incorrect facility records/maps
- ☐ Locator error
- ☐ No response from operator/contract locator
- ☐ Tracer wire issue
- ☐ Unlocatable Facility

Facility marked inaccurately due to
- ☐ Abandoned facility
- ☐ Incorrect facility records/maps
- ☐ Locator error
- ☐ Tracer wire issue

Miscellaneous Root Causes
- ☐ Deteriorated facility
- ☐ One Call Center Error
- ☐ Previous damage
- ☐ Root Cause not listed (comment required)

Part J – Additional Comments

Part Z – Images and Attachments: List the file names of any images and attachments to submit with this report

Appendix C: Glossary of Terms

Abandoned Line or Facility: Any underground or submerged line or facility no longer in use.

Alternate Locate Agreement (ALA): A contractual agreement between a facility owner and an excavator that allows the excavator to proceed with their excavation work without receiving a traditional field locate.

Backfill: The act of filling the void created by excavating or the material used to fill the void.

CCGA: The Canadian Common Ground Alliance's (CCGA) primary role is to manage damage prevention issues of national interest that Regional Partners consider best addressed through a single voice.

CGA: The Common Ground Alliance (CGA) is a member-driven association dedicated to ensuring public safety, environmental protection, and the integrity of services by promoting effective damage prevention practices.

Compliance: Adherence to acts and regulations.

Damage: Any impact, stress and/or exposure that results in the need to repair an underground facility due to a weakening or the partial or complete destruction of the facility, including, but not limited to, the protective coating, lateral support, cathodic protection or the housing for the line, device or facility.

Daylighting: The exposure of underground utility infrastructure by minimally intrusive excavation practices to ascertain precise horizontal and vertical position or other attributes. (Note: may also be referred to as "potholing" or "test pitting".)

Demolition Work: The intentional, partial or complete destruction by any means of a structure served by, or adjacent, to an underground line or facility.

DIRT: Damage Information Reporting Tool.

Downtime: Lost time reported by a stakeholder on the Damage Information Reporting Tool (DIRT) field form for an excavation project due to failure of one or more stakeholders to comply with applicable damage prevention regulations.

DQI: The Data Quality Index (DQI) is a measure of data quality and consists of the evaluation of each organization that submitted records, in addition to the evaluation of each record submitted to DIRT.

Event: The occurrence of an underground infrastructure damage, near miss, or downtime.

Excavate or Excavation: An operation using equipment or explosives to move earth, rock or other material below existing grade. (Note: Excavation can include augering, blasting, boring, coring, digging, ditching, dredging, drilling, driving-in, grading, plowing-in, pulling-in, ripping, scraping, trenching and vacuuming).

Excavator: Any person proposing to or engaging in excavation or demolition work for themselves or for another person.

Facility: See Utility Infrastructure.

Facility Owner/Operator: Any person, utility, municipality, authority, political subdivision, or other person or entity who owns, operates, or controls the operation of an underground line/facility.

Grade (noun): The surface elevation.

Grade (verb): The act of changing the surface elevation.

Joint Trench: A trench containing two or more underground infrastructures that are buried together by design or agreement.

Locate (noun): The provision of location information by an underground facility owner (or their agent) in the form of ground surface markings and/or facility location documentation, such as drawings, mapping, numeric description or other written documentation.

Locate (verb): The process of an underground plant owner/operator or their agent providing information to an excavator which enables them to determine the location of a facility.

Locate Request: A communication between an excavator and the facility owner/operator or their agent (usually the One Call Centre) in which a request for locating underground facilities is processed.

Locator: A person whose job is to locate underground infrastructure.

Near Miss: An event where damage did not occur, but a clear potential for damage was identified.

Notifications: Ticket data transmitted to underground infrastructure owners.

One Call Centre: A system which provides a single point of contact to notify facility owners/operators of proposed excavation activities.

ORCGA: The Ontario Regional Common Ground Alliance (ORCGA) is a Regional Partner of both the Common Ground Alliance (CGA) and the Canadian Common Ground Alliance (CCGA). It is a non-profit organization promoting efficient and effective damage prevention for Ontario's vital underground infrastructure.

Person: Any individual or legal entity, public or private.

Public: The general population or community at large.

Root Cause: The primary reason an event occurred.

Test Hole(s): Exposure of a facility by safe excavation practices used to ascertain the precise horizontal and vertical position of underground lines or facilities.

Ticket: All data required from an excavator to transmit a valid notification to the underground infrastructure owner.

Ticket number: A unique identification number assigned by the one call center to each locate request.

Tolerance Zone: The space in which a line or facility is located and in which special care is to be taken.

Underground: Beneath the ground surface or submerged, including where exposed by temporary excavation.

Utility Infrastructure: a cable, line, pipe, conduit, or structure used to gather, store, or convey products or services. (Note: may also be referred to as “facility” or “plant”.)

Vacuum Excavation: A means of soil extraction through vacuum where water or air jet devices are commonly used for breaking the ground.

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