

2014 DIRT Report

Version 8.0

Damage Information Reporting Tool
June 2015



orcca.com
damagereporting.org

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MESSAGE FROM THE PRESIDENT ONTARIO REGIONAL COMMON GROUND ALLIANCE



Dear Damage Prevention Stakeholders,

The Ontario Regional Common Ground Alliance (ORCGA) has collected data since 2005 to better understand the root causes that lead to these events (damages) and to develop public awareness programs to minimize the risk of future events. An ongoing challenge has been to gather data from a broader cross section of industry stakeholders within Ontario. That is beginning to improve and we expect more companies will see the value of participating in our DIRT program.

The importance of our DIRT Report to the damage prevention industry remains a key component in painting an accurate picture of where we are with respect to safety and damage prevention in Ontario. As more industry stakeholder companies submit data into DIRT, we will gain more insight and a clear view of how to enhance our public awareness programs.

For 2014 DIRT (Version 8.0), a few inconsistencies in data were experienced due to changes in stakeholder submissions. However, it continues to be seen that events (damages) are on a downward trend. It also should be noted that locate notifications have risen substantially due to the Ontario Underground Infrastructure Notification Act, 2012 (OUINA). The measure of this trend is shown in Figure 16.

While great strides have been made in reducing damages in Ontario and this trend is expected to continue, It is somewhat surprising to notice that our LOCATES vs NO LOCATES percentage has increased (Figure 3). In some ORCGA geographical areas across the Province, No Locate percentages are as low as 14% or as high as 50%, with an overall provincial average of 33%. The ORCGA continues to do an excellent job promoting the Dig Safe program; however, this data indicates that there is still a great work deal of work to be done. There should be no excuse for anyone digging without locates! This will be a key priority for the ORCGA Education Committee and our 13 geographical areas.

I sincerely encourage many more of our facility owners stakeholders become involved in the DIRT. By providing your data, we will eventually be able to gain a complete understanding of the total number of annual events there are in Ontario. You will also benefit by having a DIRT data base from which you can prepare your own statistical report showing how well you company is progressing in their damage prevention efforts.

For the 2014 DIRT report (version 8.0), our Reporting & Evaluation (R&E) Committee has included a number of impressive enhancements. These changes and the entire report are a result of the work performed by the volunteers from our R&E Committee. Led by Co-chairs Richard Durrer (Accu-Link Call Centres) & Brandon Denton (Ontario One Call), with very impressive editorial work performed by Michael Abate (Enbridge) and dedicated report coordination by Lori O'Doherty (ORCGA), the committee has produced another outstanding annual DIRT report.

On behalf of the ORCGA Board of Directors, I would like extend a sincere thank you to entire Reporting & Evaluation Committee for their excellent work.

Sincerely,

A handwritten signature in purple ink, appearing to read "Jim Douglas".

Jim Douglas
President & CEO, ORCGA



1.0 INTRODUCTION

The Ontario Regional Common Ground Alliance (ORCGA) is a non-profit organization promoting efficient and effective damage prevention for Ontario’s vital underground infrastructure. Through a unified approach and stakeholder consensus, the ORCGA fulfills its motto of “Working Together for a Safer Ontario”.

The ORCGA is a growing organization with over 490 active members and sponsors representing a wide cross section of stakeholders:

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

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)
195 King Street, Suite 105
St. Catharines, ON L2R 3J6
Tel: 1 (866) 446-4493
Fax: 1 (866) 838-6739
Email: office@orcga.com
Website: www.orcga.com

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

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 give 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, also provides the ability to monitor trends over time. The 2014 report focuses on the data gathered throughout Ontario during the three year period between 2012 and 2014. 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 wide.

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 report year as it represents only the information voluntarily submitted by industry stakeholders.

1.1 CASE STUDIES

The 2014 DIRT report features case studies of root cause investigations. Root cause investigations assess both the events leading up to the incident, the surrounding conditions, and the event outcomes or learning points. In some of the case studies presented, details may have been modified to protect the privacy of the individuals involved.

1.2 DATA

The information presented in this report is based on current information provided to the ORCGA as of December 31st, 2014.

When reviewing statistics published in this report, it is also important to note that due to retroactive submission by new DIRT users, the volume of facility events submitted by year will be changing with each report.

In 2014 inconsistencies in data exist due to changes in stakeholder submissions.

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.

As a way 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; as records with missing data were removed from the analysis.

The DIRT system compares each field within each report submitted against the fields of all other reports in DIRT, to calculate the probability that it matches an already submitted event. Based on this there is potential that the same event, may have been submitted more than once (i.e. by both the excavator and the facility owner). Repeated reporting of the same event can offer the following benefits:

- Capture of data that may be included on one submission but was omitted on another
- Insights regarding interpretation of root causes based on stakeholder group

2.0 DATA ANALYSIS

2.1 FACILITY EVENT ANALYSIS

In 2014, stakeholder submissions to the DIRT Report decreased due to staffing and organizational realignments in contributing member companies. This noted inconsistency of stakeholders submitting into DIRT has affected the total number of events reported.

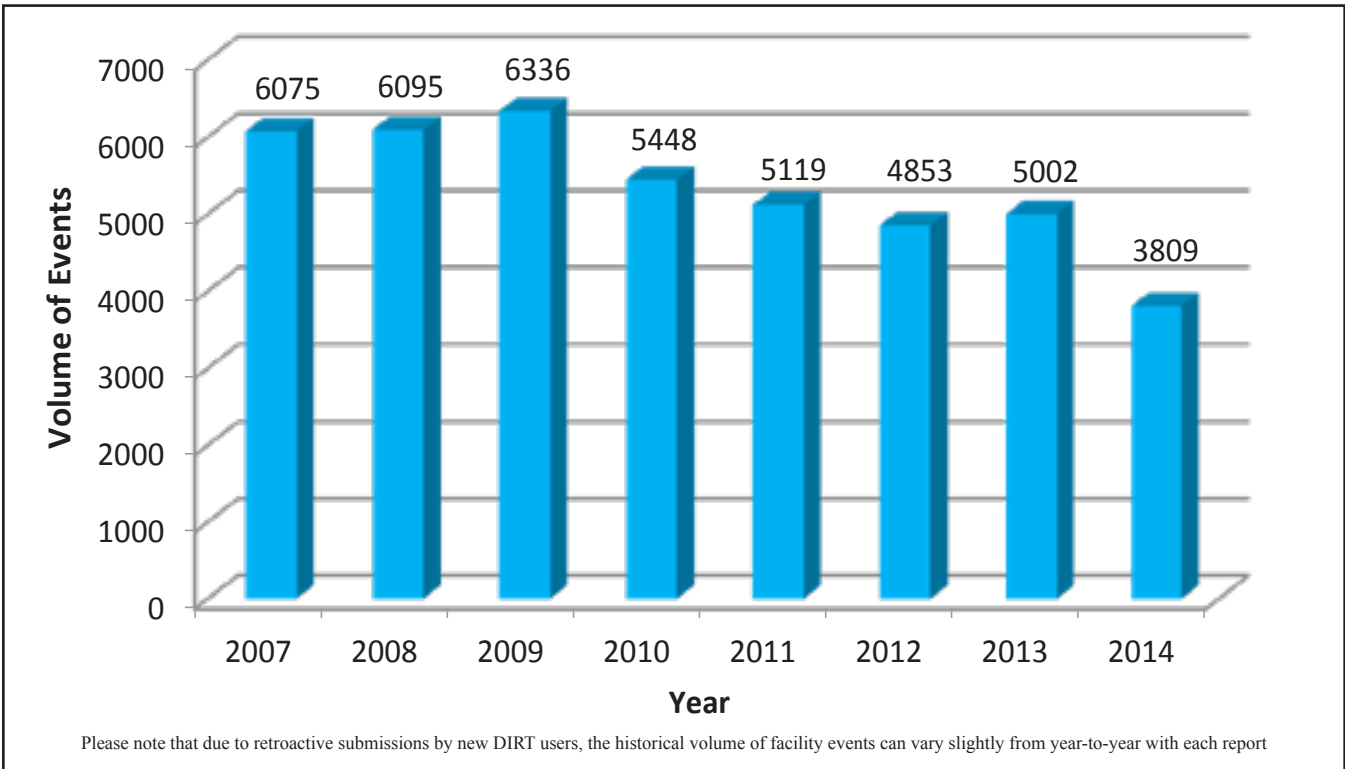


Figure 1: Facility Events Submitted by Year

OUR GOAL:

Reduce infrastructure incidents in order to increase the safety of all by identifying root causes as part of trends and metrics from Member reported data.



2.2 FACILITY EVENTS SUBMITTED ACROSS ONTARIO

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

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

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

Figure 2 illustrates the number of events for each geographical area over the past three years.

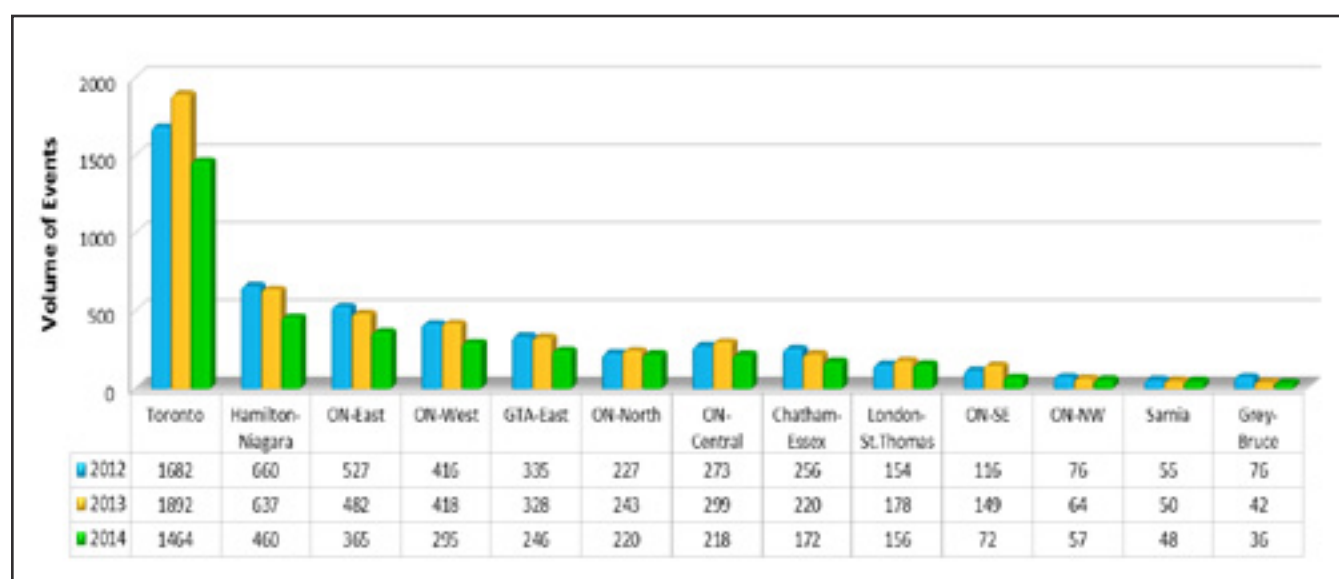


Figure 2: Volume of Events Submitted per Geographical Area

Table 2 shows the geographical breakdown of the total notifications through Ontario One Call.

Geographical Area	Notifications		
	2012	2013	2014
Chatham-Essex	161,173	194,218	232,924
Grey-Bruce	55,105	60,901	69,543
GTA-East	179,170	240,408	360,078
Hamilton-Niagara	612,699	741,467	979,111
London-St. Thomas	155,315	177,331	214,854
ON -Central	145,416	170,186	213,282
ON -East	319,315	358,468	479,021
ON -North	106,611	167,965	215,903
ON -Northwest	30,509	50,147	73,081
ON -Southeast	73,620	95,330	129,650
ON -West	297,685	410,488	497,052
Sarnia	62,083	71,364	84,160
Toronto	1,242,731	1,641,563	2,054,894
Grand Total	3,441,432	4,379,836	5,603,553



Table 2: Notifications per Geographical Council

Figure 3 illustrates a distribution by geographical area comparing the number of events in 2014 where the one call center was notified for a locate request versus not being notified for a request.

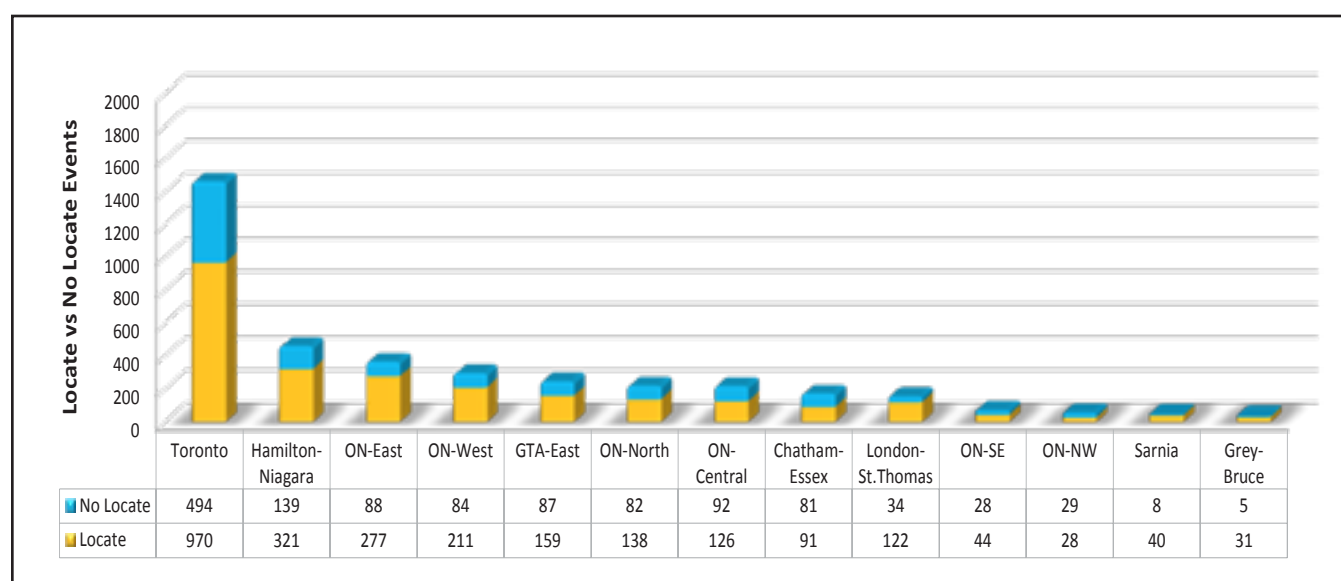


Figure 3: Locate vs. No Locate Events by Geographical Area

2.3 SUBMITTED FACILITY EVENTS BY STAKEHOLDER GROUP

Figure 4 illustrates a distribution of events by stakeholder group for the past three years. Based on the figure it can be seen that natural gas and telecommunications continue to submit the highest volumes of events. Opportunity exists for additional stakeholders to submit events which would support future trend analysis.

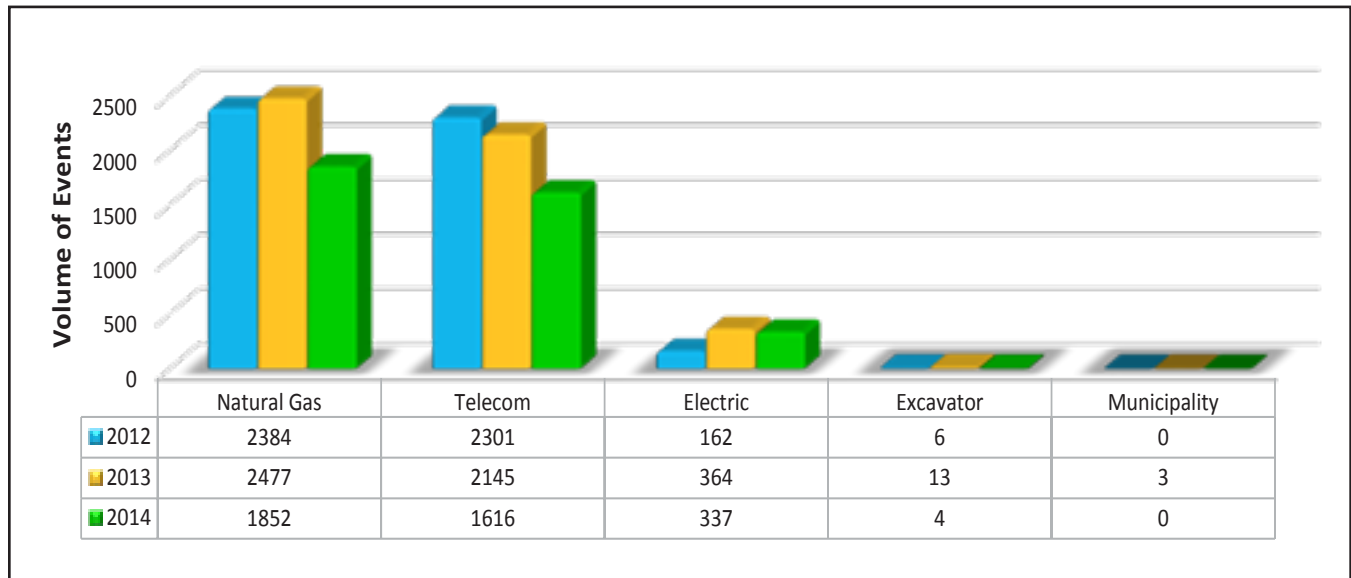


Figure 4: Facility Events Submitted By Year

2.4 SUBMITTED FACILITY EVENTS BY TYPE OF FACILITY OPERATION AFFECTED

Figure 5 illustrates that Natural Gas and Telecommunication can be seen as the primary facilities affected by events reported in DIRT. This aligns with the fact that Natural Gas and Telecommunication stakeholders continue to submit the majority of events.

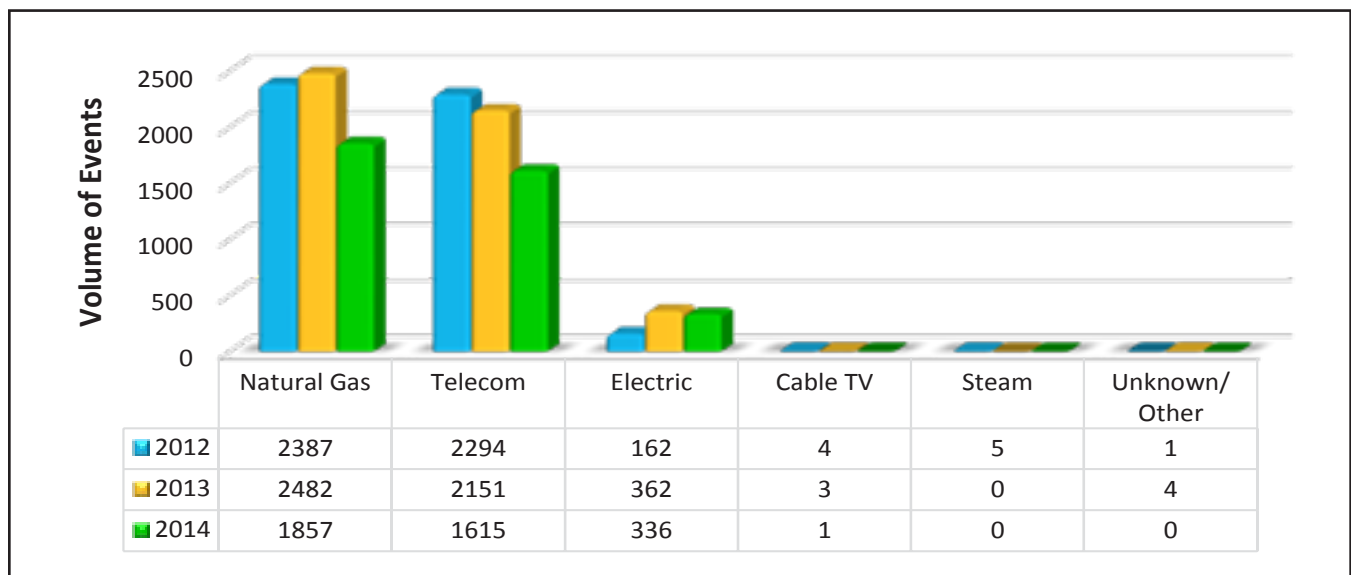


Figure 5: Submitted Facility Events by Type of Facility Affected

2.5 VOLUME OF EVENTS BY EXCAVATION EQUIPMENT GROUP

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

Group	Excavation Equipment Type	
Hoe/Trencher	Backhoe/Trackhoe	Trencher
Hand Tools	Hand Tools	Probing Device
Drilling	Auger Boring	Directional Drilling Drilling
Vacuum Equipment	Vacuum Equipment	
Other	Farm Equipment Grader/Scraper	Milling Equipment Vacuum Equipment

Table 3: List of Equipment Groups

Figure 6 illustrates a distribution of events caused by various groups of excavation equipment. In 2014 vacuum excavation equipment is being reported as its own excavation equipment group within the DIRT Report for the first time. In 2014 the Hoe/Trencher group continued to account for the largest volume of events due to a shift to other excavation methods. Efforts should be made by reporting groups to minimize listing equipment as Other in order to improve the completeness of data.

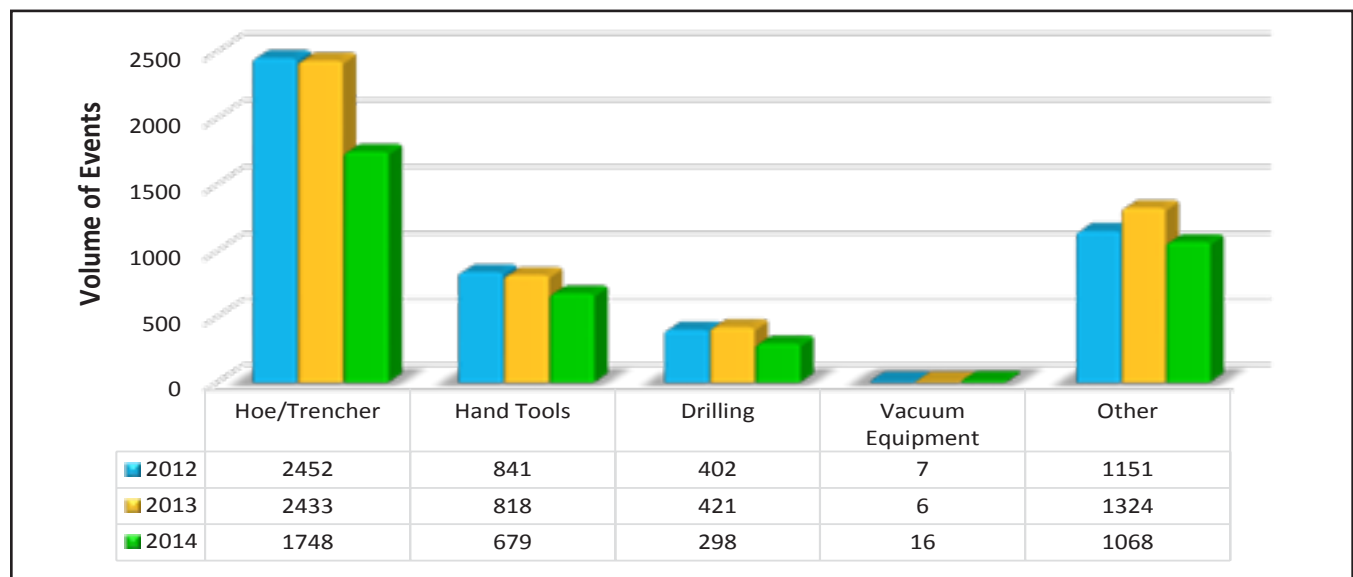


Figure 6: Submitted Facility Events by Excavation Equipment Group



The DIRT reporting tool is simple to use and provides us with valuable statistical information for bench marking how we measure up to industry standards.
EnWin Utilities

CASE STUDY NO. 1

Damage Prevention Through Collaboration

2.0

Over the past four years, a small GTA town in collaboration with their local transit provider has been completing a transit project for a 2.6km stretch of a highly populated major road. The project is a road widening and beautification to include dedicated rapid transit bus lanes and stations along the center. It was awarded through a design/ build contract in 2011 with major construction occurring over the course of 2012 to 2014 and final surface activities to be completed in 2015.

Throughout this project multiple construction contractors and utility providers have been operating in a collaborative manner to relocate existing buried infrastructure out of conflict without disrupting utility services to the populated area while navigating multiple challenges.

Utility providers were engaged early in the design phase to outline plans and coordinated what utility assets had to be moved and/or protected during the construction phase. This early engagement and schedule forecasting provided certain utility providers opportunities to relocate and/or upgrade utility asset layouts to increase network robustness and remove buried utility road crossings.

Once construction was underway there were up to seven sub-contractors at a given time in addition to utility companies working over the entire construction site. Activities were scattered over the entire construction site in non-geographic sequence and were related to moving utility assets, new sewer installations, road work, and associated bridge and river crossings. Over the course of the entire construction phase, traffic laneways and public walkways had to constantly be reconstructed to maintain public safety and 24/7 access to the road which is the only point of access to the local hospital.

The abundance of work being conducted by multiple parties over a short period of time in reoccurring areas created construction challenges. Challenges were related to the mandatory separation by time and/or space of construction parties, maintaining locate markings, and providing locates to be able to work safely in the vicinity of buried utilities.

The challenges related to providing locates were from the fact that due to the abundance of activity in the area, there were time constraints to create new records and update records systems between initially moving certain utility assets and subsequent relocations of the same asset being required or there being activity by another party in the vicinity. These challenges were compounded by the facts that landmark offset points along the surface kept changing thereby making existing records ineffective for locating in addition to surface work degrading locate markings on a regular basis. This meant that when some utilities were unearthed during ground disturbance activities there was a requirement to positively confirm if utility assets were abandoned.

In order to overcome challenges regarding locates, two locators were assigned to the jobsite to have all associated locate requests completed as a priority. This allowed for multiple utility asset types to be located by dedicated personnel that provided continuity of operations while ensuring that locates were up to date.

In addition to having dedicated locators, damage prevention inspectors and personnel from various utility providers were onsite regularly and available as necessary to all parties conducting work to; confirm abandoned utility assets, ensure crews are following safe excavation practices, and to provide support/ consultation as necessary. These individuals managed multiple requests daily that were able to prevent utility damages which prevented the unnecessary dispatch of repair crews and ultimately prevented delays in the overall project.

By engaging all associated parties (consultants, contractors, constructors, utility owners, etc.) early and consistently in a collaborative manner from the initial design onwards while continuously utilizing safe ground disturbance practices, the project was successfully completed. This resulted in the project being completed on schedule, while maintaining a high standard of safety.



2.6 FACILITY EVENTS BY ROOT CAUSE

Table 4 details the Root Cause subcategories included in each main category. Refer to the Root Cause Tip Card (Appendix A) for a more detailed breakdown of the meaning of each root cause subcategory. Depending upon which reporting stakeholder submitted the data for a facility event, root cause volumes can vary significantly.

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

Table 4: Root Cause Category and Subcategory

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 further understand the most common reasons for facility events, the distribution of root cause subcategories should be examined.

Figure 7 illustrates the distribution of events by root cause category. It can be seen the most common cause of events was a result of Excavation Practices Not Sufficient. Emphasis should be made to reduce events due to Notification Not Made and to provide targeted outreach / educational information to excavators to reduce events attributed to Excavation Practices Not Sufficient.

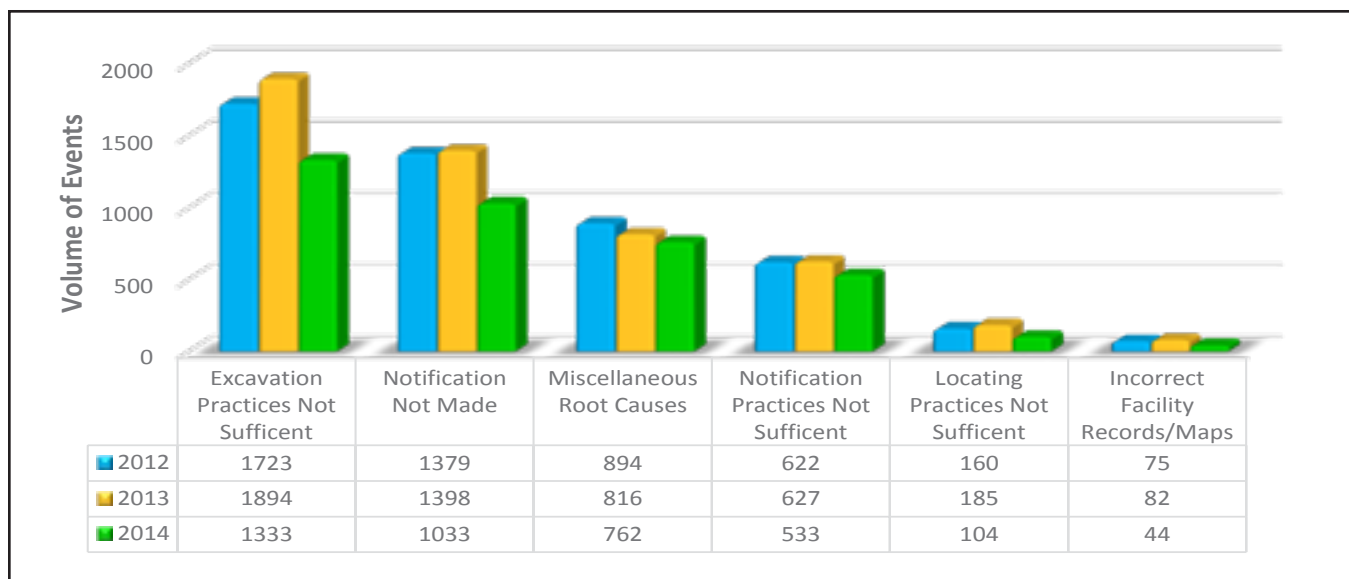


Figure 7: Facility Events by Root Cause Category

Figure 8 illustrates a breakdown of the root cause subcategories for the Other Insufficient Excavation Practices root cause category for the past three years. The most prevalent root cause is Other Insufficient Excavation Practices. 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 the Excavation Practices Not Sufficient.

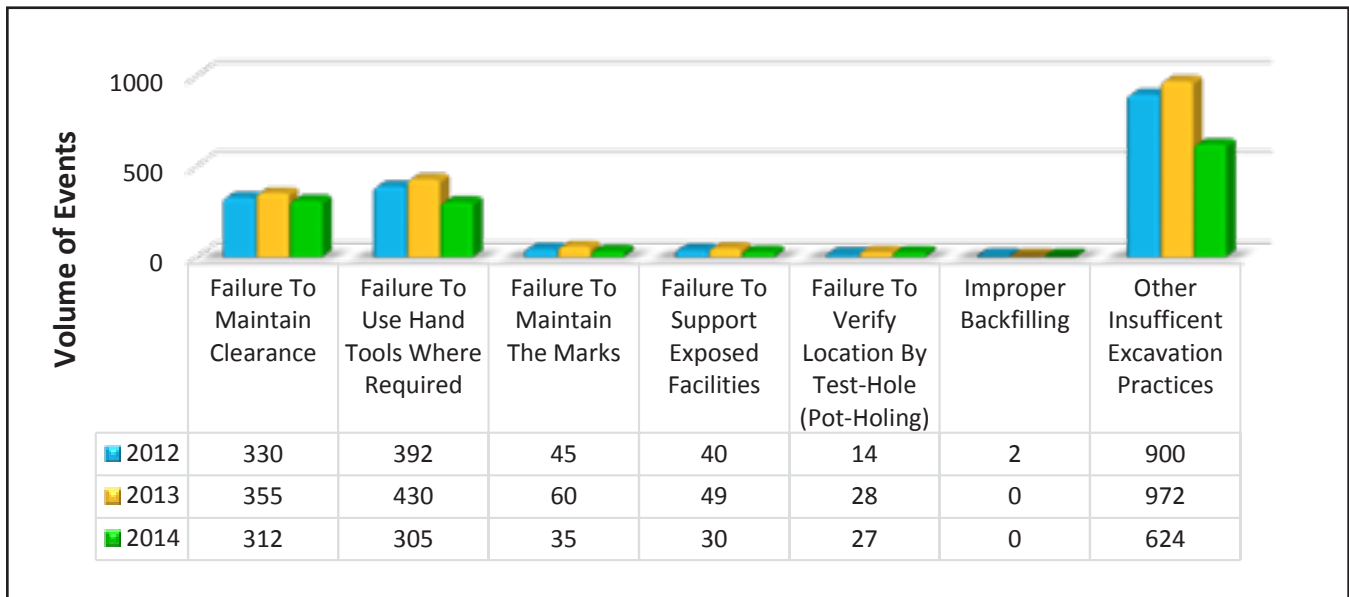


Figure 8: Facility Events by Excavation Practices Not Sufficient

Figure 9 illustrates a breakdown of the root cause subcategories for the Locating Practices Not Sufficient for the past three years. The most prevalent root cause subcategory is Facility Marking Or Location Not Sufficient. Refer to Root Tip Card (Pg. 22) for examples of Facility Marking Or Location Not Sufficient events.

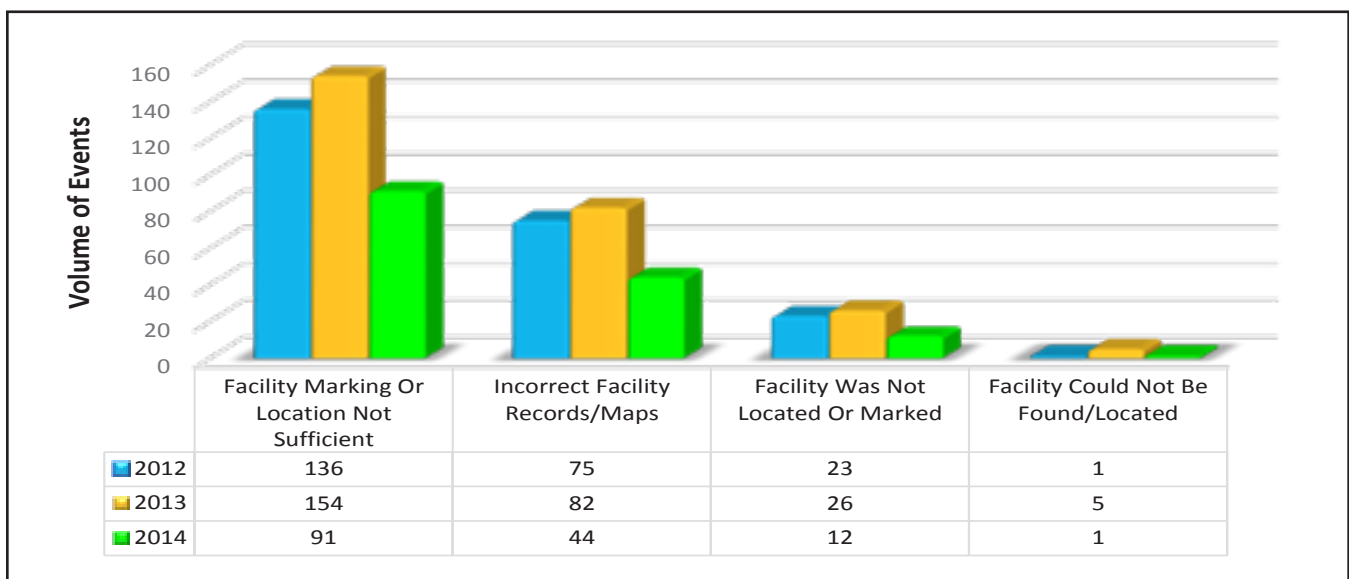


Figure 9: Facility Events by Locating Practices Not Sufficient

Figure 10 illustrates a breakdown of the root cause subcategories for the Notification Practices Not Sufficient root cause category for the past three years. This figure illustrates the need for the locate requestor to provide more complete and accurate data. Insufficient Notification To The One-Call Centre accounts for the greatest volume of events submitted under this root cause. This subcategory includes instances such as inadequate information or lead times for a locate request.

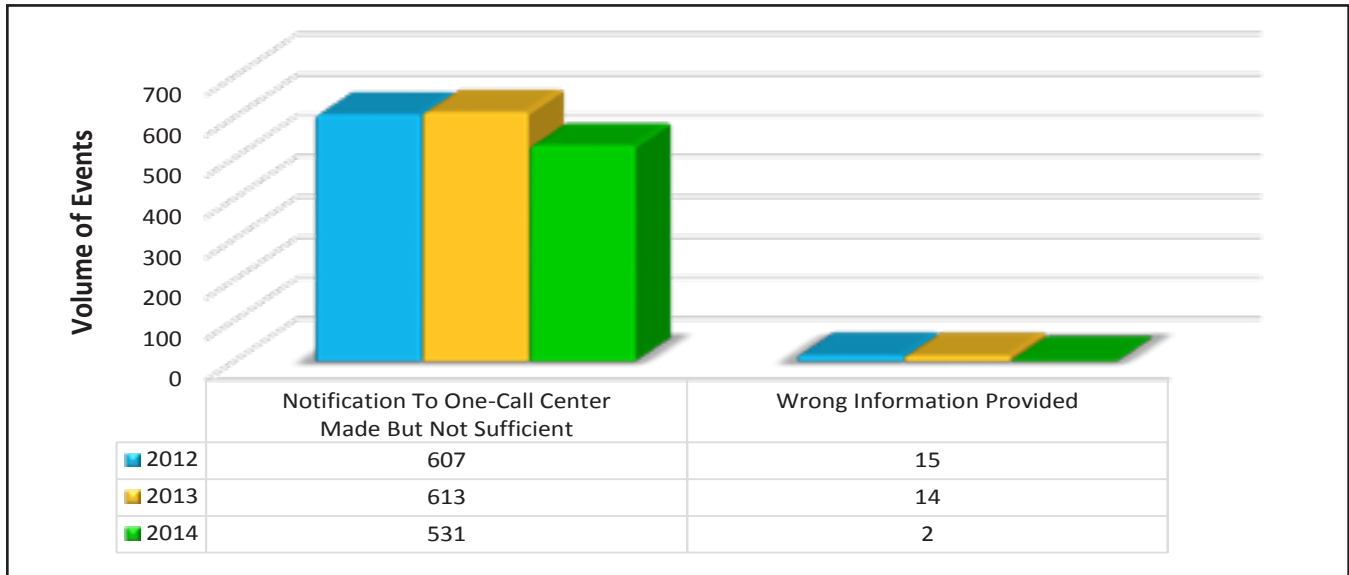


Figure 10: Facility Events by Notification Practices Not Sufficient

Figure 11 illustrates a breakdown of the Root Cause subcategories for the Facility Events by Miscellaneous root cause for the past three years. This figure illustrates the need for stakeholders to complete the Root Cause field. The Data Not Collected subcategory accounts for 16.7% of the total events for all Root Causes, and is a measure of all events where a root cause was not selected. Further efforts must be applied to categorize each event.

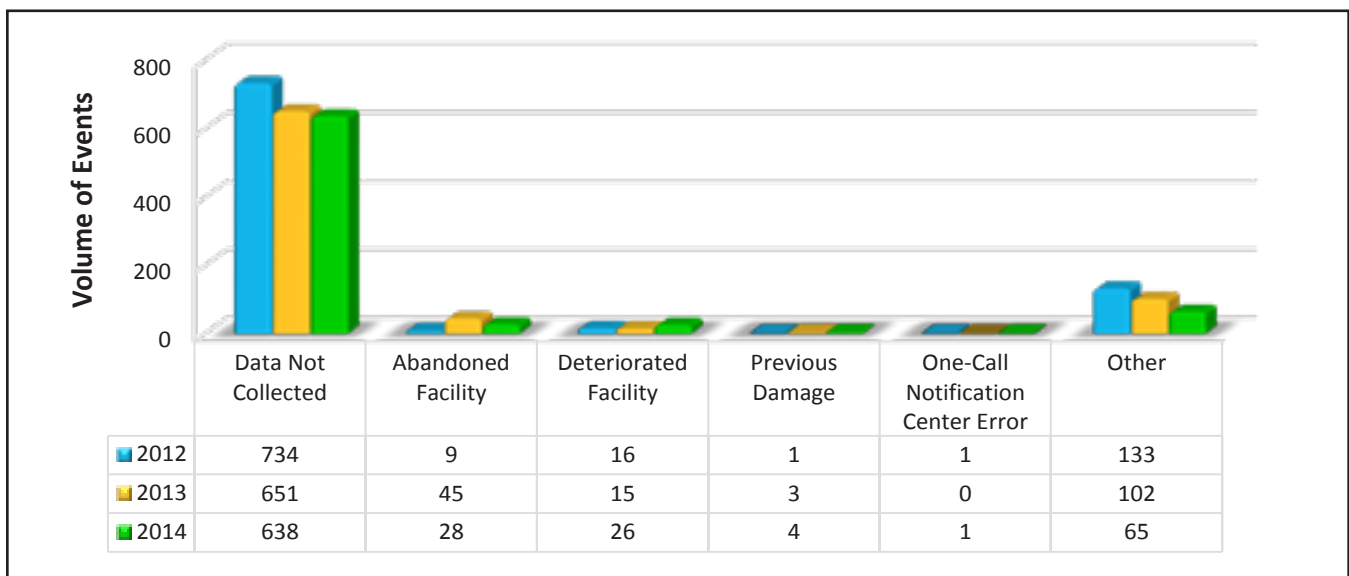


Figure 11: Facility Events by Miscellaneous Root Cause

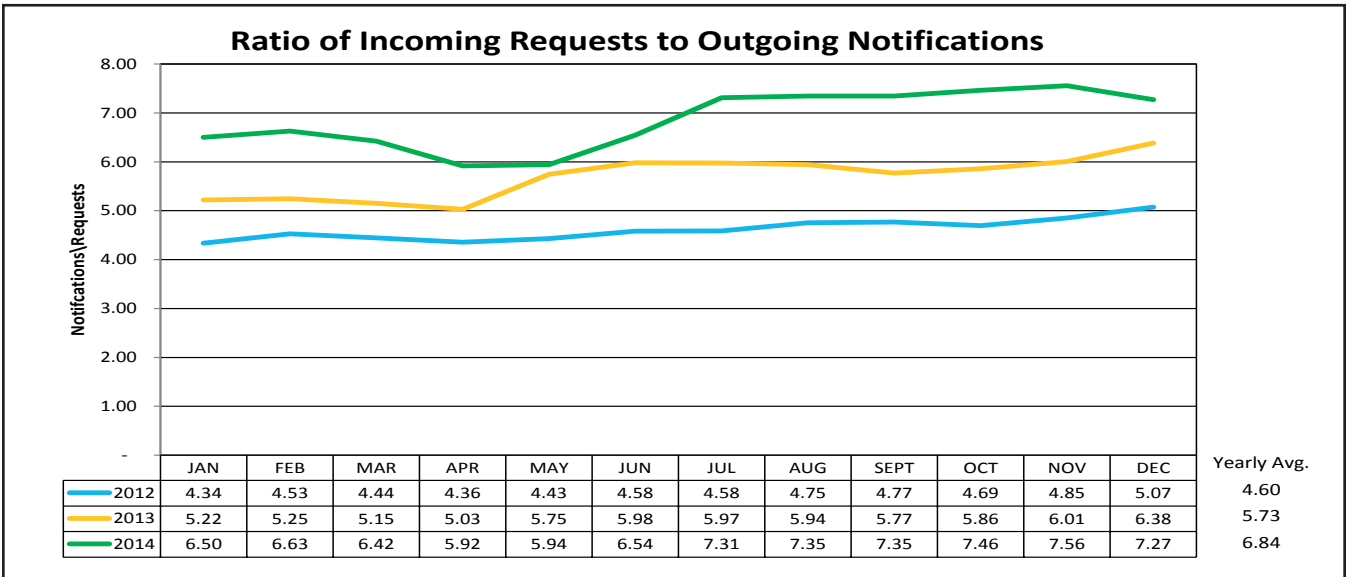
LOCATE REQUESTS VERSUS NOTIFICATIONS

When a requester contacts Ontario One Call, the request is analyzed and then notifications are sent to the appropriate members near your ground disturbance/work site. The request can generate multiple notifications which in turn result in a completed locate response.

For example in Toronto, if you were to submit a request for digging in Toronto on Yonge St. between Dundas Sq. and Shuter St., Ontario One-Call would send approximately 19 notifications, which in turn generate 19 responses from buried infrastructure owners.

The figure below outlines the historical ratio of facility notifications per locate request in Ontario by month for the last three years. It can be seen that the ratio continues to increase on a yearly basis with spike occurring in the summer months.

The ratio of notifications per request varies based on geography and the amount of buried infrastructure present. In Ontario the average request generates seven notifications to facility owners.



Locate Requests Versus Notifications



D.I.R.T is a valuable reporting tool in capturing and tracking damage trends to our infrastructure.
Enersource



CASE STUDY NO. 2

Guideline for Excavation in Vicinity of Utility Lines not Followed

2.0

A contractor operating a large excavator struck and damaged a service tee located on a six inch- high pressure gas main. Due to the blowing gas Police and Fire officials ordered an evacuation of the area including a nearby school. In order to safely access the site and make the necessary repairs to the line the Utility had to isolate it by closing an upstream valve. The line was one-way feed serving a town of approximately 4,000 residential, commercial and industrial customers. Subsequently all customers in the town had their gas service interrupted until the repairs to the line could be completed.

Prior to the incident the contractor had called the Ontario One Call center for a line locate. The locate was provided and due to the gas main's importance, the locate indicated that any excavation in the vicinity of the line required Third Party Observation. Third Party Observation is a process wherein the Utility will provide an onsite representative to observe the excavation taking place to insure the line is not impacted. The obligation is on the contractor to call the Utility to arrange for the Third Party Observation prior to excavating in the vicinity of the line. However in this instance the contractor did not contact the Utility. Rather the contractor dug test holes in two locations approximately 50 feet apart to determine the depth of the six inch-main. The contractor proceeded to excavate directly above the pipeline between the test holes when they struck the service tee which was protruding six inches above the main.

In this scenario the contractor failed to undertake two important steps that could have prevented the incident. First the contractor should have followed the expressed instructions on the locate and requested Third Party Observation. Secondly the contractor should not have been operating the large excavator in close proximity to the gas main. Section 8.0 (Excavating After Tests Holes Are Completed) as set out in the Guideline for Excavating in the Vicinity of Utility Lines dictates that mechanical excavation must not be used within one foot of gas main.

As a result of the break the contractor was faced with a substantial invoice for the costs incurred to repair the line, the shut down and relight costs to the 4,000 customers as well as numerous business interruption losses from the impacted businesses. In addition the Technical Standards and Safety Authority (TSSA) investigated the incident and charged the contractor under the TSSA Act.

2.7 FACILITY EVENTS BY EXCAVATOR GROUP

Figure 12 illustrates the distribution of events by Type Of Excavator showing that Contractor/Developer continues to be involved in the majority of the reported events. 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 group is provided within the Multiple Field Analysis section of this report on pages 17-18.

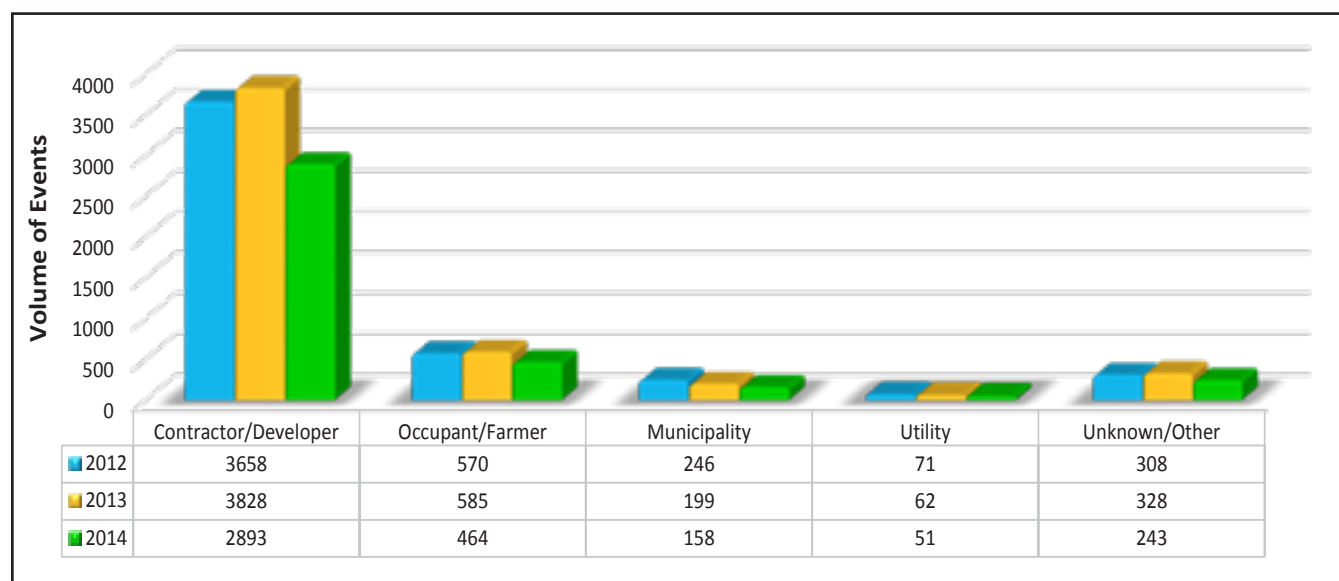


Figure 12: Facility Events by Type of Excavator



DIRT is a tool that allows utility owners to efficiently track important damage information and develop metrics.
Enbridge Gas Distribution Inc.

NOTES

2.8 FACILITY EVENTS BY TYPE OF WORK PERFORMED

Table 5 illustrates a distribution of Events By Type Of Work. It is seen that the Sewer & Water and Utility work type group continues to be involved in the majority of events submitted. Emphasis should be placed by groups submitting events to reduce the amount listed as unknown/Other in order to improve data completeness and accuracy.

In order to develop useful educational tools to improve the damage prevention performance in Ontario, it is important to examine the common Types Of Work associated with causing events.



Group	Type of Work Performed	2012	2013	2014
Construction	Bldg. Construction	451	484	380
	Bldg. Demolition	13	11	17
	Driveway	133	115	105
	Grading	29	31	16
	Site Development	37	59	40
Green	Agriculture	1	3	4
	Fencing	390	424	256
	Irrigation	5	1	2
	Landscaping	369	334	254
	Waterway Improvement	24	28	34
Sewer & Water	Drainage	141	133	126
	Sewer (Sanitary/Storm)	290	265	226
	Storm Drain/Culvert	35	35	29
	Water	844	937	678
Street & Road	Curb/Sidewalk	149	128	111
	Milling	0	0	0
	Public Transit Authority	2	5	9
	Railroad Maintenance	3	2	2
	Road Work	277	243	184
	Street Light	9	2	10
	Traffic Sign	13	16	8
	Traffic Signal	4	4	3
Utility	Cable TV	80	57	24
	Electric	282	308	249
	Liquid Pipeline	0	0	1
	Natural Gas	139	166	146
	Petroleum Pipeline	0	0	0
	Pole	21	25	28
	Steam	5	0	0
	Telecommunications	253	276	241
Unknown/ Other	Data Not Collected	1	1	1
	Engineering/Surveying	1	3	2
	Unknown/Other	857	906	623

Table 5: List of Work Included in each Work Group

3.0 MULTI-FIELD ANALYSIS

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 Sewer & Water, Green, Construction, Utility, Street & Road Work and Unknown/Other for the years 2013 and 2014.

Figure 14 illustrates that the Excavation Practices Not Sufficient is the largest root cause in 2014.

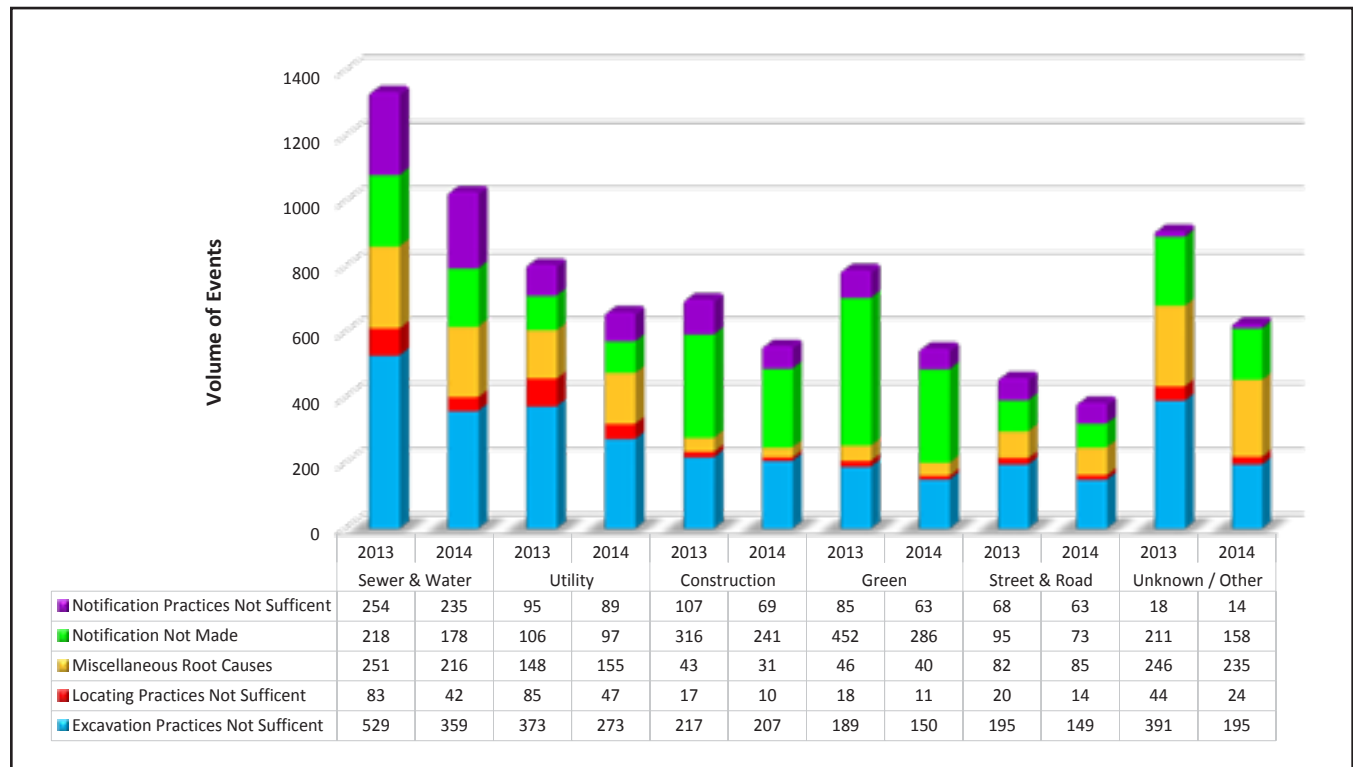


Figure 14: Facility Events by Root Cause Group and Industry



D.I.R.T. paints the whole damage picture. It identifies trends, which allow us to better tailor our safe excavation awareness programs to help decrease damages to our plant.

Union Gas Limited

Figure 15 illustrates that the Contractor/Developer excavator type still represents the majority of events submitted under the Excavation Practices Not Sufficient.

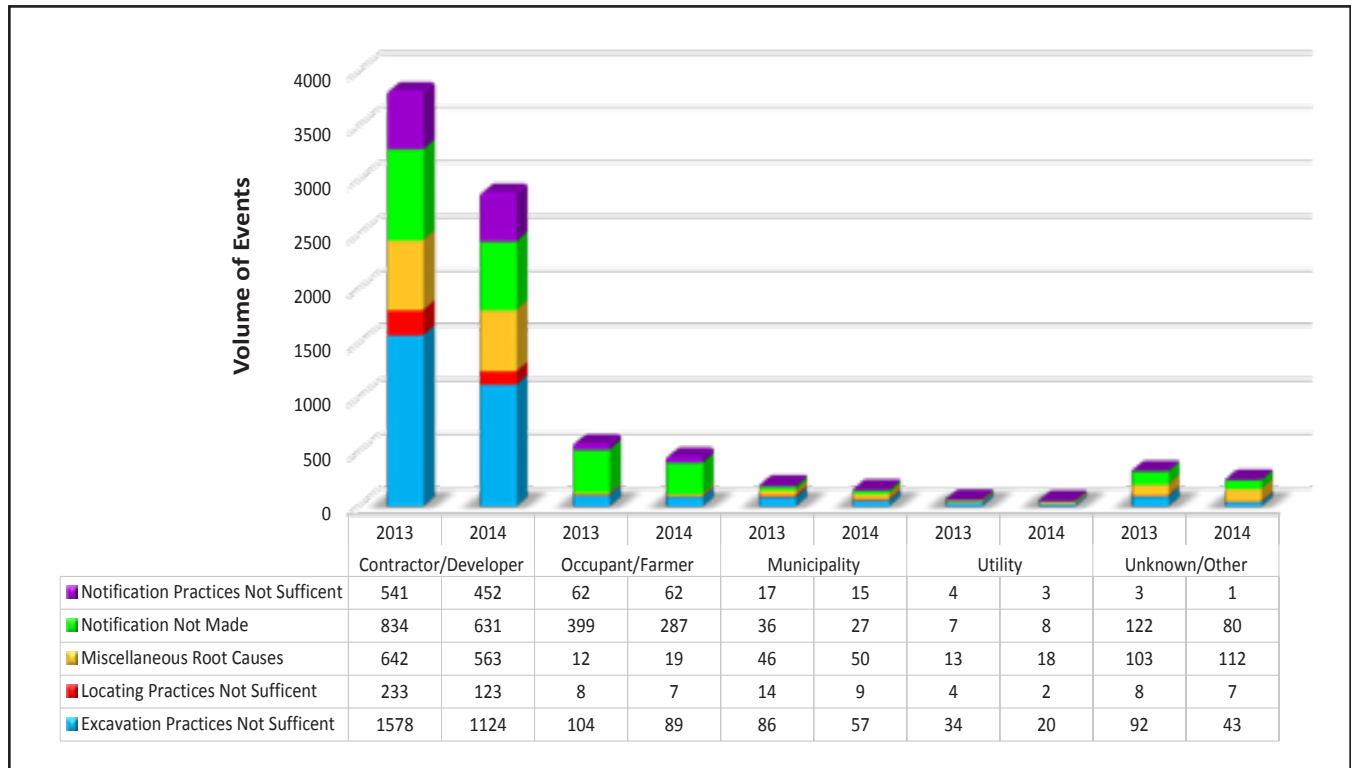
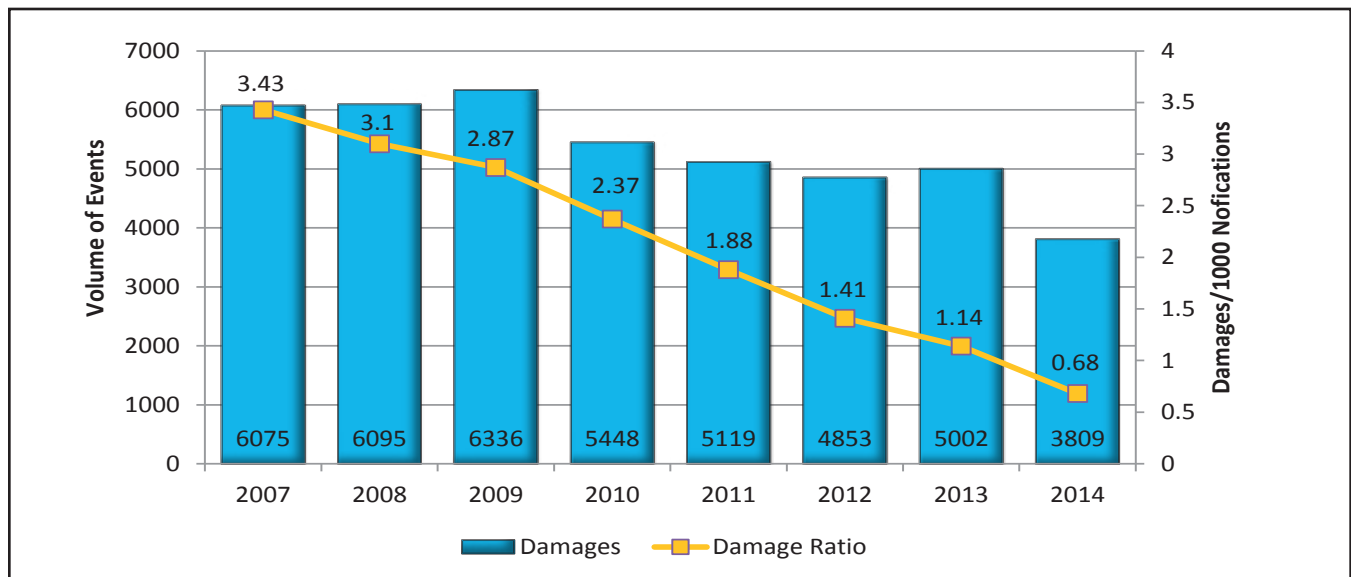


Figure 15: Facility Events by Root Cause Category and Excavator Type

Figure 16 illustrates that the damage ratio relative to the volume of events over the past eight years. Industry practice is to measure damage prevention performance by the volume of damages per thousand notifications.



Mandatory Legislation has increased notification base

Figure 16: Damage Ratio - Damages/1000 Notifications

4.0 REPORT FINDINGS

4.1 DATA QUALITY INDEX INDICATIONS

Table 10 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 73.8%.

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 “2014 DQI” column in the table below represents the average of all 3809 submitted events in the 2014 dataset.

DIRT Parts	Relative Weight	2012 DQI	2013 DQI	2014 DQI
A: Who is submitting this information?	5%	100.0	100.0	100.0
B: Date and Location of the event	12%	76.2	78.9	78.9
C: Affected Facility Information	12%	92.2	92.1	89.7
D: Excavation Information	14%	84.2	83.0	82.6
E&F: Notification, Locating, Marking	12%	90.1	90.4	89.9
G: Excavator Downtime	6%	13.4	12.8	13.2
H: Description of Damage	14%	33.9	31.8	35.8
I: Description of the Root Cause	25%	82.5	85.0	81.6
Total Weighted DQI	100%	74.1	74.5	73.8

Table 10: DIRT Submission Parts and DQI

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. The DQI for Part I: Description Of The Root Cause has slightly decreased between 2013 and 2014.

4.2 RECOMMENDATIONS

The ORCGA makes the following observations and recommendations to Damage Prevention stakeholders based on the analysis of the 2014 DIRT report. These are intended to enhance industry efforts to reduce events and standardize the data collection process. Based on the results of the 2014 DIRT report the Reporting and Evaluation committee have identified the following recommendations:

1) No Locates remains a significant issue as there has been an observed increase in the number of No Locate events. This must be addressed as a primary focus of ORCGA education efforts within 2015 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 geographical areas which show above average percentages of No Locate events (Figure 3).

2) The total number of events continues to decline. While there is missing data in 2014 from members for 2014 that have contributed to DIRT in previous years, the amount missing is not equivalent to 1200 events which is the decline currently observed (Figure 2.1). This is a very encouraging trend as there is an increase in members submitting to DIRT which corresponds to increasing the percentage of total events that are captured. Emphasis should continue to be placed in increasing the number of DIRT submissions so as to provide a more accurate representation of all events within Ontario for a given year.

3) There is a need to ensure that the Root Causes field is assigned appropriately as 638 of events (Figure 11) do not have a root cause assigned. Additionally it is noticed that in many instances when a major root cause is assigned the sub-category is often left as Other Insufficient Excavation Practices (Figure 8). Root cause data is the determining factor in where the ORCGA and stakeholders should focus efforts in damage prevention and worker safety with specific educational materials and best practices.

4) Emphasis needs to be placed on growing the use of DIRT by underground infrastructure owners. While the majority of submissions are by Ontario's Telecommunication, and Natural Gas stakeholders, there is a significantly lesser amount of by Electrical, Excavator, and Municipal stakeholders. DIRT is a free damage reporting tool that can be used to track and report on events. Increased participation would also help increase the amount of data shared to stakeholders and the ORCGA.

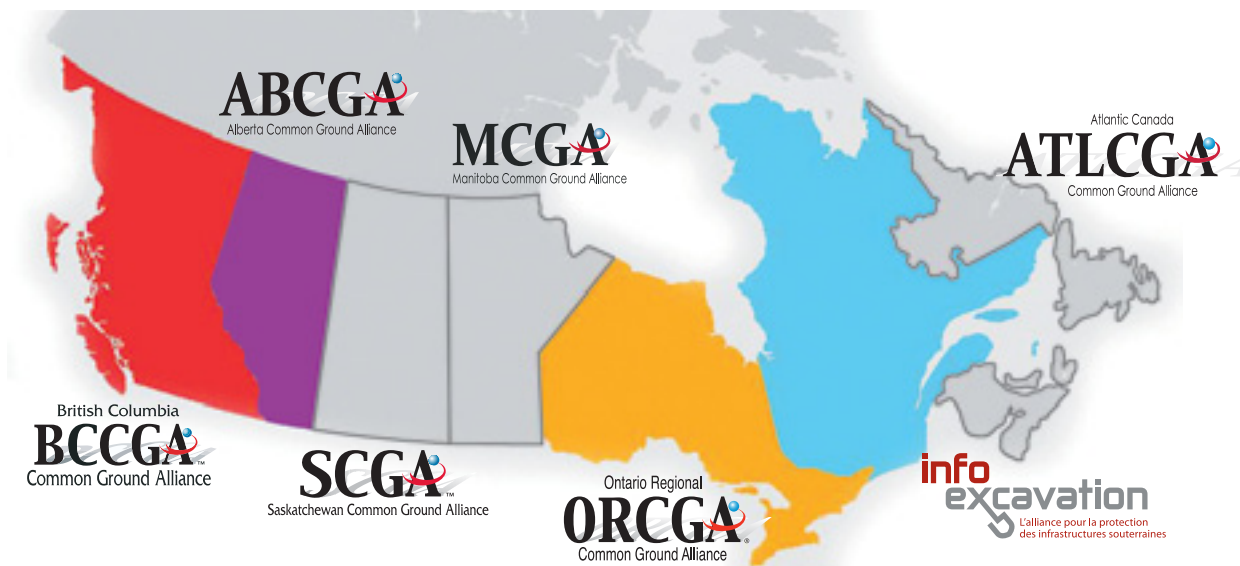
5) Over the past years there has been observed increase in the number of notifications. This is a direct result of legislation that has culminated in all stakeholders being a part of the Ontario One Call Centre with the last spike of influx members being in June of 2014. It is therefore expected to begin seeing a reduction in the growth rate of notifications from the addition of stakeholders to Ontario One Call. Over the next three years the notification growth rate should be moderately consistent with the amount of Excavator education and/or the overall economic growth in the Province.

5.0 REGIONAL PARTNER DATA

The following information was provided by four Canadian Common Ground Alliance (CCGA) Regional partners. This data reflects the volume of events submitted by their members from 2012-2014.

Since 2003, DIRT has been the North American standard for data collection and reporting of underground damage information. The Alberta Common Ground Alliance (ABCGA) began reporting into DIRT in 2012. The British Columbia Common Ground Alliance (BCCGA) joined the DIRT reporting community in 2011, releasing their first DIRT Report in September 2012. The Quebec Common Ground Alliance (QCCGA) joined DIRT in 2010, with their first report being released the same year.

Regional Common Ground Alliances have also been established for Saskatchewan, Manitoba and Atlantic Canada (Newfoundland & Labrador, New Brunswick, Nova Scotia, and Prince Edward Island) with DIRT reporting expected to commence in the upcoming years.



6.0 EXCAVATOR OF THE YEAR

The Excavator of the Year distinction is presented to an excavator with the best-in-class safe digging practices. Each year a subset of the R&E Committee, consisting of representatives of each of the utilities, is tasked with reviewing each contractor’s individual damage ratio. The damage ratio is dependent on the volume of locates, of which each excavator must have a minimum of 500, measured against the number of digging related damages to the underground structure. The recipient of the award is the excavator with the lowest damage ratio who best reflects the type of work in each category represented.

6.0

Telecommunication



Dyna-co Construction

Gas



T.W. Johnstone Contractors Co. Ltd.

Sewer & Water



WM. Groves Ltd.

Landscape



Loki Trees Reforestation Ltd.:
Member of the Brinkman Group of Companies

Homebuilder



Thomas Cavanach Construction Ltd.



Roadbuilder



Brennan Paving

Electric



El-Con Construction

Most Improved



Bradley Kelly Construction

APPENDIX A: ROOT CAUSE TIP CARD

Root Cause Tip Card

LOCATING PRACTICES NOT SUFFICIENT

Facility could not be found or located

Type of facility or lack of records prevented locating of facility.

Example: Plastic pipelines installed without tracer wire.

Facility marking or location not sufficient

Includes all areas where marking was insufficient.

Example: Locator marked the work zone, but missed a service.

Locator misread the ticket and did not locate the entire work zone.

Locator did not use records or interpreted the records incorrectly.

Locator did not tone correctly.

Facility was outside the tolerance zone.

Facility was not located or marked

No locating or marking was completed prior to excavation activities.

Example: The company received a valid ticket but did not mark, locate, or communicate with the excavator prior to start of work.

Incorrect facility records/maps

Incorrect facility records or maps led to an incorrect locate.

Example: Records show the facility located on the wrong side of the street and ticket was cleared.

Records do not accurately reflect current plant status.

ONE-CALL NOTIFICATION PRACTICES NOT SUFFICIENT

No Notification made to the One-Call Centre

Excavator did not call the one-call centre.

Notification to one-call centre made, but not sufficient

The Excavator contacted the notification centre, but did not provide sufficient information, or the excavator did not provide sufficient notification time according to requirements and guidelines.

Example: Excavator did not wait for the locate to be completed prior to digging.

Excavator was excavating with an expired locate.

Excavator was excavating outside of the located area.

Excavator was excavating without the locate onsite.

Wrong information Provided to the one-call centre

Damage occurred because an excavator provided the wrong excavation information to the notification centre.

Example: Excavator indicated the wrong dig site.

After speaking with the excavator, the locator incorrectly cleared a ticket.

EXCAVATION PRACTICES NOT SUFFICIENT

Failure to maintain marks	The marks deteriorated or were lost and the excavator failed to request that they be restored/refreshed.
Failure to support exposed facilities	Facility damage due to lack of support in accordance with generally accepted engineering practices or guidelines.
Failure to use hand tools where required	
Failure to test-hole (pot-hole)	Failure to verify physical location of the facility when working within tolerance zone as defined by accepted practices or guidelines.
Improper backfilling practices	Damage caused by improper materials (ex. Large/sharp rocks) in the backfill or improper compaction of the backfill.
Failure to maintain clearance	Excavator failed to maintain clearance (defined by applicable guidelines, law, and facility owners) from underground facilities when using power/mechanical equipment.
Other insufficient excavation practices	Excavator errors that do not fall under one of the above.

MISCELLANEOUS ROOT CAUSES

One-Call Centre Error	<p>Includes all issues related to the centre such as incorrectly entered data, ticket transmission failures, et al.</p> <p><i>Example:</i> This would include damages that occurred because the centre's database registry had not been updated to reflect correct location of underground facilities. The one-call centre system crashed and failed to deliver the ticket.</p>
Abandoned Facility	<p>Damage related to abandoned facilities.</p> <p><i>Example:</i> The abandoned facility may have been located, instead of the active facility. This does NOT include when an abandoned facility is thought to have been located, but it is found to be active after the excavation exposed the facility or damaged it.</p>
Deteriorated Facility	Those situations in which an excavation disrupts the soil around the facility resulting in damage, failure or interruption of service. However, the deterioration and not the excavation caused the facility damage.
Previous Damage	<p>Damage occurred during previous excavation.</p> <p><i>Example:</i> Pipe coating was damaged during a previous excavation and was not reported. Subsequently, a corrosion leak occurred, or subsequent excavation at the site revealed the damage to the pipe.</p>
Data Not Collected	<p>Damage occurred, but Root Cause was not identified.</p> <p><i>Example:</i> Damage Investigator did not indicate a Root Cause.</p>

APPENDIX B: DAMAGE INFORMATION REPORTING FIELD FORM

Rev: 2/1/2012

*** indicates a Required Field

Damage Information Reporting Tool (DIRT) - Field Form

Part A – Who is Submitting This Information

Who is providing the information?			<input type="checkbox"/> Electric	<input type="checkbox"/> Engineer/Design	<input type="checkbox"/> Equipment Manufacturer
<input type="checkbox"/> Excavator	<input type="checkbox"/> Insurance	<input type="checkbox"/> Liquid Pipeline	<input type="checkbox"/> Locator	<input type="checkbox"/> Natural Gas	<input type="checkbox"/> Railroad
<input type="checkbox"/> One-Call Center	<input type="checkbox"/> Private Water		<input type="checkbox"/> Public Works	<input type="checkbox"/> Unknown/Other	
<input type="checkbox"/> Road Builders	<input type="checkbox"/> State Regulator		<input type="checkbox"/> Telecommunications		

Name of the person providing the information:

Part B - Date and Location of Event

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

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

Street address **Nearest Intersection**

***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 ☐ Data not collected ☐ Unknown/Other

Part C – Affected Facility Information

***What type of facility operation was affected?**

☐ Cable Television ☐ Electric ☐ Natural Gas ☐ Liquid Pipeline ☐ Sewer (Sanitary 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?

☐ Unknown ☐ Yes ☐ No

Was the facility owner a member of One-Call Center?

☐ Unknown ☐ Yes ☐ No

Part D – Excavation Information

***Type of Excavator**

☐ Contractor ☐ County ☐ Developer ☐ Farmer ☐ Municipality ☐ Occupant

☐ Railroad ☐ State ☐ Utility ☐ Data not collected ☐ Unknown/Other

***Type of Excavation Equipment**

☐ Auger ☐ Backhoe/Trackhoe ☐ Boring ☐ Drilling ☐ Directional Drilling

☐ Explosives ☐ Farm Equipment ☐ Grader/Scraper ☐ Hand Tools ☐ Milling Equipment

☐ Probing Device ☐ Trencher ☐ Vacuum Equipment ☐ Data Not Collected ☐ Unknown/Other

***Type of Work Performed**

☐ Agriculture ☐ Cable Television ☐ Curb/Sidewalk ☐ Bldg. Construction ☐ Bldg. Demolition

☐ Drainage ☐ Driveway ☐ Electric ☐ Engineering/Survey ☐ Fencing

☐ Grading ☐ Irrigation ☐ Landscaping ☐ Liquid Pipeline ☐ Milling

☐ Natural Gas ☐ Pole ☐ Public Transit Auth. ☐ Railroad Maint. ☐ Road Work

☐ Sewer (San/Storm) ☐ Site Development ☐ Steam ☐ Storm Drain/Culvert ☐ Street Light

☐ Telecommunication ☐ Traffic Signal ☐ Traffic Sign ☐ Water ☐ Waterway Improvement

☐ Data Not Collected ☐ Unknown/Other

Part E – Notification

***Was the One-Call Center notified?**

☐ Yes (If Yes, Part F is required) ☐ No (If No, Skip Part F)

If Yes, which One-Call Center?

If Yes, please provide the ticket number

Part F - Locating and Marking

***Type of Locator**

☐ Utility Owner ☐ Contract Locator ☐ Data Not Collected ☐ Unknown/Other

***Were facility marks visible in the area of excavation?**

☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

***Were facilities marked correctly?**

☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other

Part G – Excavator Downtime**Did Excavator incur down time?**
☐ Yes ☐ No
If yes, how much time?
☐ Unknown ☐ Less than 1 hour ☐ 1 hour ☐ 2 hours ☐ 3 or more hours Exact Value _____
Estimated cost of down time?
☐ Unknown ☐ \$0 ☐ \$1 to 500 ☐ \$501 to 1,000 ☐ \$1,001 to 2,500 ☐ \$2,501 to 5,000
☐ \$5,001 to 25,000 ☐ \$25,001 to 50,000 ☐ \$50,001 and over Exact Value _____
Part H – Description of Damage***Was there damage to a facility?**
☐ Yes ☐ No (i.e. near miss)
***Did the damage cause an interruption in service?**
☐ Yes ☐ No ☐ Data Not Collected ☐ Unknown/Other
If yes, duration of interruption
☐ Unknown ☐ Less than 1 hour ☐ 1 to 2 hrs ☐ 2 to 4 hrs ☐ 4 to 8 hrs ☐ 8 to 12 hrs ☐ 12 to 24 hrs
☐ 1 to 2 days ☐ 2 to 3 days ☐ 3 or more days ☐ Data Not Collected Exact Value _____
Approximately how many customers were affected?
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 10 ☐ 11 to 50 ☐ 51 or more Exact Value _____
Estimated cost of damage / repair/restoration
☐ Unknown ☐ \$0 ☐ \$1 to 500 ☐ \$501 to 1,000 ☐ \$1,001 to 2,500 ☐ \$2,501 to 5,000
☐ \$5,001 to 25,000 ☐ \$25,001 to 50,000 ☐ \$50,001 and over Exact Value _____
Number of people injured
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____
Number of fatalities
☐ Unknown ☐ 0 ☐ 1 ☐ 2 to 9 ☐ 10 to 19 ☐ 20 to 49 ☐ 50 to 99
☐ 100 or more Exact Value _____
Part I – Description of the Root Cause *Please choose one*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 to One Call Center

Excavation Practices Not Sufficient

- ☐ Failure to maintain marks
☐ Failure to support exposed facilities
☐ Failure to use hand tools where required
☐ Failure to test-hole (pot-hole)
☐ Improper backfilling practices
☐ Failure to maintain clearance
☐ Other insufficient excavation practices

Locating Practices Not Sufficient

- ☐ Facility could not be found or located
☐ Facility marking or location not sufficient
☐ Facility was not located or marked
☐ Incorrect facility records/maps

Miscellaneous Root Causes

- ☐ One-Call Center error
☐ Abandoned facility
☐ Deteriorated facility
☐ Previous damage
☐ Data Not Collected
☐ Other

Part J – Additional CommentsVisit DIRT at www.cga-dirt.com

APPENDIX C: GLOSSARY OF TERMS

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

Backfill: To fill the void created by excavating.

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.

Damage: Any impact 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.

Demolition Work: The 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: Any operation using non-mechanized or mechanized equipment, demolition or explosives in the movement of earth, rock or other material below existing grade.

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

Facility: An underground or submerged conductor, pipe or structure used in providing electric or communications service (including, but not limited to, traffic control loops and similar underground or submerged devices), or an underground or submerged pipe used in carrying, providing, or gathering gas, oil or oil product, sewage, storm drainage, water, or other liquid service (including, but not limited to, irrigation systems), and appurtenances thereto.

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: The surface of the earth (i.e., ground level) upon which a structure is built or prepared.

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 one call centre personnel 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.

Notification: Ticket data transmitted to underground infrastructure owner by the One Call Centre.

One Call Center: A system through which a person can with only one phone call or other communications, notify multiple facility owners/operators of proposed excavations.

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

Ticket: All the data required from an excavator by the One Call Centre to transmit a valid Notification to the buried infrastructure owner (Member).

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.

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

GOLD



SILVER



BRONZE

