Ontario Regional
ORCGA
Common Ground Alliance

DIG SAFE

2024 DIRT REPORT

Ver 18.0

Blocked sewer?

Always call before you clear.

Sewer drain emergencies and flooded basements can be stressful. But before you or a plumber attempt to clear a blocked sewer or septic line, be sure to call **Ontario One Call** toll free at **1-800-400-2255** for a free sewer safety inspection.

Resolve clogs quickly and safely

- Blockages in pipes that run inside your home typically can be cleared safely on your own.
- If the clog is in sewer or septic pipes that run outside the walls of your home, call **Ontario One Call** before you or a plumber attempt to clear it.
- Never use motorized or water-jetting equipment to clear a blocked sewer line without an inspection.

What is a cross bore?

In rare cases, underground natural gas pipelines could unintentionally run through sewer or septic pipes—this is called a cross bore. Left undisturbed, cross bores aren't an immediate safety risk. However, using motorized or water-jetting equipment to clear a blocked sewer line could damage the natural gas line, resulting in a real and immediate risk to public safety, including a gas leak, fire or explosion.

Smell gas? Act fast!

Natural gas smells like rotten eggs or sulphur. If you smell gas or think you have a gas leak, leave the area immediately and call Enbridge Gas at 1-866-763-5427 or 911 from a safe distance (like a neighbour's home).

To request an inspection, contact Ontario One Call at 1-800-400-2255. These inspections are available 24/7 and are treated as emergencies. If a cross bore is found, the sewer line will be fixed at no cost to you.

ENBRIDGE
Life Takes Energy®

Visit **enbridgegas.com/sewersafety** for more safety information and videos.

Douglas Lapp,
President & CEO

Underground infrastructure provides crucial essential services to homes, businesses, public institutions, and communities. Whether it is delivery of natural gas for heating, electric power for lighting, high speed fibre for communications, or water supply; these are all critical for both business and day to day living. The risk of disruption to the delivery of these services through this vital infrastructure exists every day, and at every excavation job site.

2024 marked a year where construction activity dropped off as indicated by the drop in locate requests, and in particular during the construction season as seen by the decreased trending of locate requests in May through to August. Declines in construction activity in the Telecom and Gas Distribution sectors during 2024 certainly contributed to this trend.

To provide the best defence against underground strikes, the understanding and analysis of infrastructure damages or events and drilling down into their root causes will help to determine which aspects of the excavation process should be targeted for awareness, training, and oversight to reduce the frequency and consequences of these events. To continually improve this analysis, the ORCGA, with the help of its' members must actively encourage the ongoing collection of data from a broader cross section of industry stakeholders, particularly municipal infrastructure owners of water, sewer and street lighting as well as local electrical utility distribution companies (LDCs).

The overall number of damages in 2024 decreased from 2023 by approximately 7.5%, bringing the number of recorded damages to 3,933, the lowest annual number of damages in over 10 years!

Of note were the decrease of 3.2% for inbound locate requests overall, and a corresponding decrease in One Call outbound notifications of 6.9%. These results show an improvement in the Damages/1,000 Requests ratio of 6.6%, with the Damages/1,000 Notifications ratio unchanged at 0.74, likely due to improved mapping and concerted efforts for office clears. Decreases in damage events were noted in most areas across Ontario, with sizable decreases in the London-St. Thomas area of over 40% and Niagara-Hamilton at 15.4%.

The most prevalent root cause for underground utility damages continues to be Excavation Issues, however, with an improvement over 2023 of 9.4%! Notification Issues remained fairly steady compared with 2023 but continue to be a concern as they accounted for 31.5% of all damages.

Clearly, there continues to be ongoing work ahead to educate and be vigilant on safe digging practices and the need to Click Before You Dig.

For this 2024 DIRT Report several enhancements have been made by the ORCGA Reporting & Evaluation Committee (R&E) including an analysis of root cause trending for the past 5 years and a Geographic Area map to more easily identify which areas correspond to the various regions, municipalities and cities. A new Root Cause Determination flow chart is now available to better determine the most accurate root cause for damages and is included as Appendix A.

The 2024 DIRT Report is the result of the dedicated volunteers on the R&E Committee, led by Co-Chairs Leah Villada, Hydro One and Amanda Gillis, GTel.

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 2024 DIRT Report was accessible on the ORCGA website, as well as being distributed to all members by April 1st, the start of the 2025 Dig Season.

Ontario Regional
ORCGA
Common Ground Alliance

Reporting & Evaluation Committee Members

The Reporting & Evaluation (R&E) Committee is a group of diverse stakeholders who are responsible for analyzing the data submitted into the Damage Information Reporting Tool (DIRT), identifying trends, making recommendations based on the data, and ensuring that the annual DIRT Report is created and published in a timely manner. The R&E Committee also determines the ORCGA Excavator of the Year award winners. We welcome any new industry members to get involved; your voice matters. Contact us at **office@orcga.com** or **(866) 446-4493**.

Leah Villada, Co-Chair
Programs Process Specialist
Hydro One

Amanda Gillis, Co-Chair
Coordinator, Claims & Damage Prevention
G-Tel

Derek Mepstead
Senior Investigator
Rogers

Ashley Esseltine
Claims Analyst
Rogers

David Holden
Damage Prevention Inspector
Toronto Hydro

Richard Durrer
Consultant
Ontario One Call

Gord Campbell
Technical Trainer, OQ Evaluator
Aecon Utilities Inc.

Warren Fisher
Advisor, Damage Prevention
Enbridge Gas Inc.

Tony Millikin
Consultant

Douglas Lapp
President and CEO
ORCGA

Lori O'Doherty
Consultant
ORCGA

Tony DiPede
General Manager
North Rock Group

Raffaello Taurino
Director, Health & Safety
Clearway Group

Mike Arcuri
Regional Operations Manager
PVS Contractors

Jhenny Villagra
Sr Project & Information Mgmt Lead
Ontario One Call

Kristina Schneider
Municipality

Sean Adkins
Utility Services Manager
Milton Hydro

Gillian McFarlane, E.I.T
Project Manager, Development Engineering
Town of Caledon

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Ontario Regional ORCGA Common Ground Alliance

The Ontario Regional Common Ground Alliance (ORCGA) is a non-profit organization that is driving Safe Excavation for workers, the public and underground infrastructure through Advocacy, Education and Engagement.

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

Electrical Distribution	Insurance	Railways
Electrical Transmission	Land Surveying	Regulator
Engineering	Landscape/Fencing	Road Builders
Equipment and Supplies	Locator	Safety Organization
Excavator	Municipal & Public Works	Telecommunications
Homebuilder	Oil & Gas Distribution	Transmission Pipelines

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 on its various committees and board.

Please visit **www.orcga.com** to learn about the scope of the various committees.

Ontario Regional Common Ground Alliance (ORCGA)
3583 Sheppard Ave. E., Suite 301
Toronto, ON M1T 3K8

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**.

1.1 Reporting and Evaluation Committee Recommendations

1. Excavation Issues

Excavation Issues account for 37% of all events and continues to be the number one root cause, leading to significant safety risks and financial losses. To address this issue, we need to provide targeted outreach training, and education to excavators.

Failure to Maintain Clearance was the leading factor in Excavation related damages. We recommend referring to **CCGA Best Practice 4-19 (Excavation within the Tolerance Zone)** which describes the methods to consider when exposing any underground facility.

*See **Page 15**, Figure 9 & **Page 17**, Figure 10*

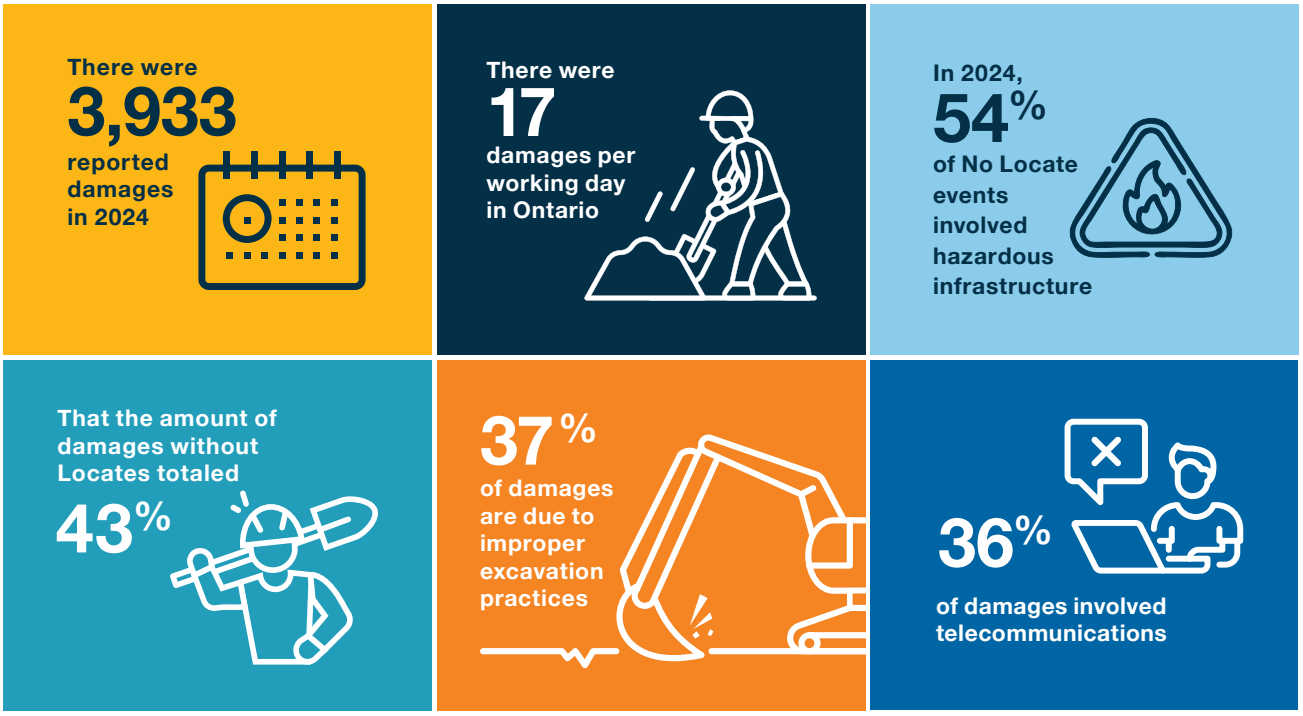
2. No Notification to One Call Centre

Despite the improvements in the 'No Notifications' root cause subcategory in 2024, it still accounts for a significant 32% of all events.

*See **Page 10**, Figure 3 & **Page 11**, Figure 5*

Dig Safe messaging is critical to preventing no locate requested damages, and it should be a top priority for the ORCGA future campaigns. By focusing on geographic areas with high percentages of No Locate Requests events, we can significantly reduce the number of no locate damages. Contractor/Developers accounted for 61% of no locate damages in 2024, reinforcing continued education on the importance of Click Before You Dig.

Did You Know?



1.2 Data Collection & Methodology

The Damage Information Reporting Tool (DIRT) is an international database in conjunction with all Provinces and States used to gather meaningful data about the occurrence of facility damages and near misses (otherwise known as events). Gathering this data allows the ORCGA to analyze the contributing factors and recurring trends in order to identify potential educational opportunities to meet our overall goals of reducing damages and increasing public and worker safety.

The annual DIRT Report provides a summary and analysis of the known events submitted during the prior year, and the ability to monitor trends over time. The 2024 report focuses on the data submitted throughout Ontario between 2020 and 2024. This data can be helpful for all stakeholders to use as a benchmark for their damage prevention performance as it identifies current issues facing the industry. It also provides Common Ground Alliance (CGA) organizations the opportunity to compare metrics against others.

The data submitted is not inclusive of all facility events that occurred during the reporting year as it represents only the events with complete data that were voluntarily submitted by industry stakeholders. The data includes both damages and near misses however, near misses account for less than 1% of reported events. Stakeholders can refer to the Data Quality Index on Page 27 which illustrates the overall level of quality of the submitted data.

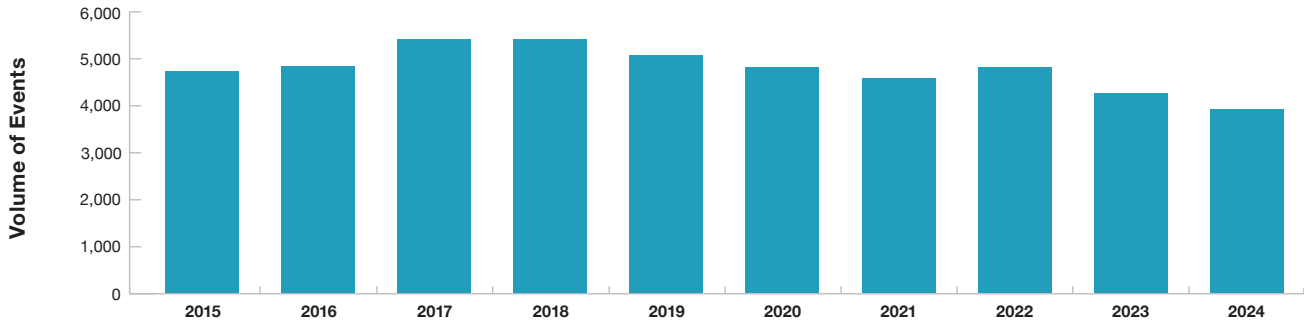
When reviewing statistics published in this report, it is important to note that some contributors complete retroactive submissions for the five-year reporting period. This can cause the volume of facility events submitted by year to differ by DIRT report.

2.0 | Data Analysis

2.1 Event Analysis

The 2024 reporting period demonstrated positive progress in damage prevention, with 3,933 facility events* representing a 7% decrease from the previous year. This marks one of the lowest totals recorded since the inception of the DIRT Report. Through detailed analysis of this data, this report identifies key trends, patterns, and opportunities to further strengthen damage prevention strategies and continue this downward trend in facility events.

Figure 1: Events Submitted by Year



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Voume of Events	4,695	4,806	5,367	5,388	5,061	4,783	4,554	4,829	4,251	3,933

***Definitions:**

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

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.

2.2 ORCGA Geographic Areas

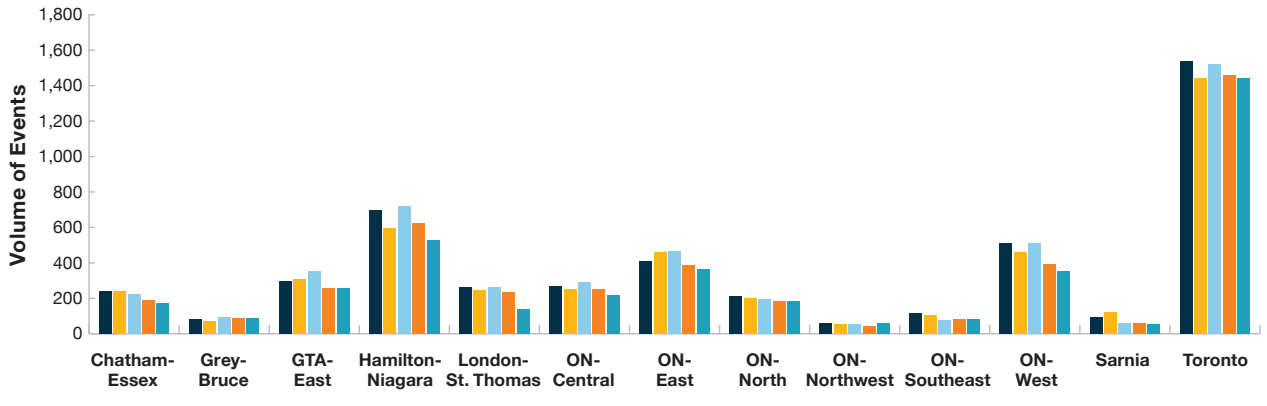
Table 1 outlines the ORCGA geographic areas and the constituent municipalities/cities.

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

Geographic Area	Region/Municipality/City
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, Stormont, 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 2 illustrates the number of events for each geographic area over the past five years. The data reveals a consistent downward trend across most geographic regions, with several areas showing notable improvements in damage prevention. This widespread reduction in events suggests that current damage prevention strategies are having a positive impact across Ontario.

Figure 2: Volume of Events by Geographic Area



	Chatham-Essex	Grey-Bruce	GTA-East	Hamilton-Niagara	London-St. Thomas	ON-Central	ON-East	ON-North	ON-Northwest	ON-Southeast	ON-West	Sarnia	Toronto
2020	237	83	299	698	260	269	410	213	57	115	510	95	1,536
2021	242	70	309	597	248	250	457	201	53	107	460	121	1,439
2022	225	95	350	722	262	293	466	197	54	74	513	58	1,520
2023	190	86	259	621	234	249	389	184	45	82	394	62	1,456
2024	171	88	255	525	140	218	363	181	59	83	353	53	1,444

Geographic Area

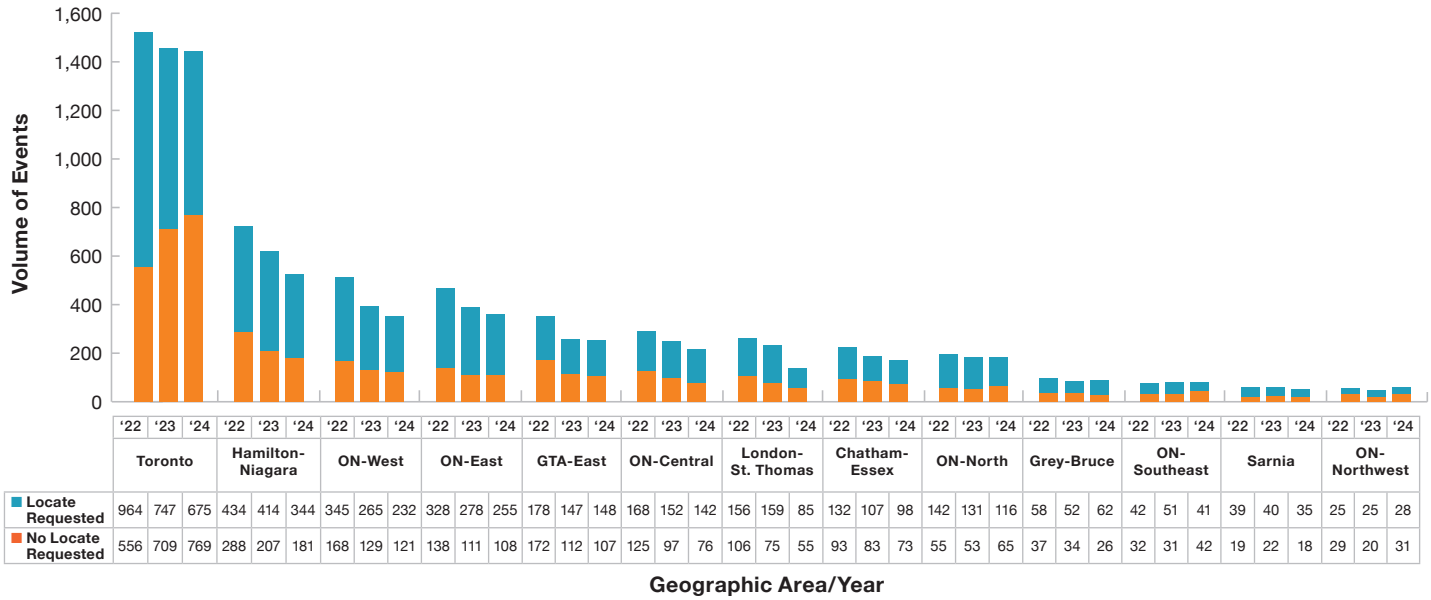
The total volume of notifications decreased by 7% in 2024, aligning with the overall reduction in construction and excavation activity across the province. Table 2 provides a detailed breakdown of notifications by geographic area, illustrating regional variations in excavation activities and locate requests. This correlation between notifications and activity levels helps provide context for the damage prevention trends observed in 2024.

Table 2: Notifications by Geographic Area

Geographical Area	2020	2021	2022	2023	2024
ON-Central	206,678	241,198	253,699	259,667	225,463
Chatham-Essex	299,473	313,816	286,483	227,905	226,862
ON-East	613,616	678,522	632,810	565,838	532,593
Grey-Bruce	87,449	103,032	110,792	106,177	91,527
GTA-East	428,078	473,380	462,862	445,433	398,779
Hamilton-Niagara	882,364	909,844	914,040	898,509	789,244
London-St. Thomas	244,691	284,812	267,477	256,234	239,254
ON-North	193,942	195,532	180,318	182,530	188,247
ON-Northwest	70,736	70,264	64,981	63,719	62,365
Sarnia	86,089	104,735	93,172	80,416	93,778
ON-Southeast	123,212	134,991	131,355	132,430	131,757
Toronto	1,970,221	2,044,766	1,978,923	2,003,031	1,891,788
ON-West	539,783	586,820	571,122	519,374	471,608
GRAND TOTAL	**5,746,332**	**6,141,712**	**5,948,034**	**5,741,263**	**5,343,265**

Figure 3 provides a three-year comparative analysis of events, where a locate request was submitted to Ontario One Call (OOC). This analysis can help identify areas where targeted education and outreach efforts may be most beneficial for improving damage prevention practices. This data is further categorized by geographic areas.

Figure 3: Locate Request Versus No Locate Request Events by Geographic Area

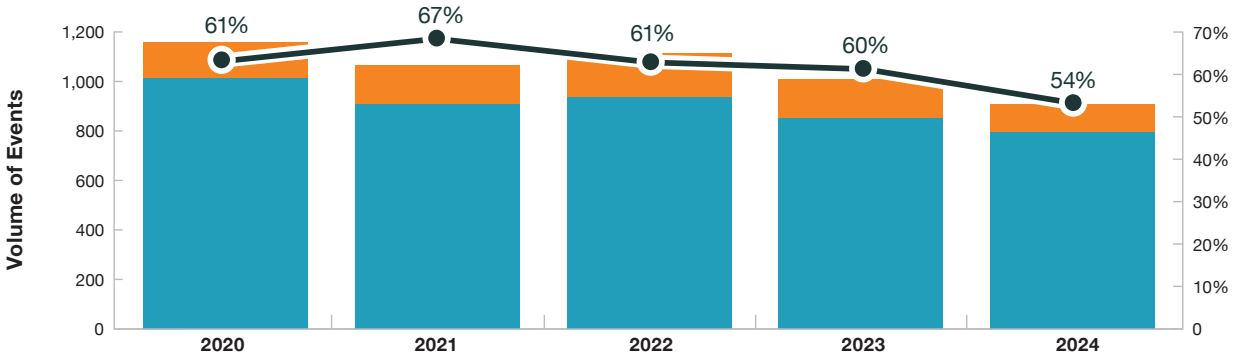


	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24	'22	'23	'24
	Toronto			Hamilton-Niagara			ON-West			ON-East			GTA-East			ON-Central			London-St. Thomas			Chatham-Essex			ON-North			Grey-Bruce			ON-Southeast			Sarnia			ON-Northwest		
Locate Requested	964	747	675	434	414	344	345	265	232	328	278	255	178	147	148	168	152	142	156	159	85	132	107	98	142	131	116	58	52	62	42	51	41	39	40	35	25	25	28
No Locate Requested	556	709	769	288	207	181	168	129	121	138	111	108	172	112	107	125	97	76	106	75	55	93	83	73	55	53	65	37	34	26	32	31	42	19	22	18	29	20	31

Analysis of events with no locate request in 2024 reveals that 54% involved hazardous infrastructure, with 793 incidents affecting Natural Gas facilities and 115 impacting Electrical infrastructure. The high percentage of incidents involving critical infrastructure underscores the importance of obtaining a complete locate package before excavation, as these events carry significant risk potential for public safety, worker safety, and essential service disruption.

CCGA Best Practice 3-14, describes a Locate Report through a Practice Statement and a Practice Description. A complete Locate package includes a Locate Report from every utility owner identified through the One Call Service, and any private locates required to complete the proposed work safely.

Figure 4: Events with No Locate Request involving Hazardous Infrastructure



	2020	2021	2022	2023	2024
Electric	147	161	180	159	115
Natural Gas	1,013	907	936	849	794
% of Events with No Locate Request involving Hazardous Infrastructure	61%	67%	61%	60%	54%

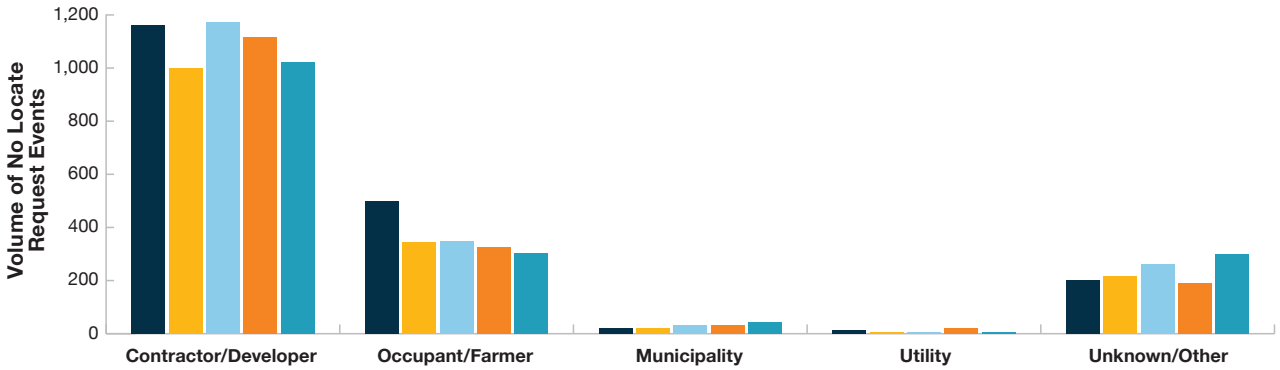
Year

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

The data shows that Contractor/Developers accounted for 61% of events where no locate request was submitted in 2024. These statistics highlight an opportunity to enhance damage prevention through increased awareness of proper procedures and the importance of obtaining a complete locate package before excavation begins.

CCGA Best Practice 2-27 establishes the fundamental requirement for excavators to contact the Notification Service before excavating. Adherence to this practice plays a crucial role in damage prevention, promoting safety, efficiency, and cost-effectiveness for all stakeholders.

Figure 5: Events with No Locate Request by Excavator Group



	Contractor/Developer	Occupant/Farmer	Municipality	Utility	Unknown/Other
2020	1,161	500	19	12	200
2021	999	343	21	7	215
2022	1,174	347	31	5	261
2023	1,115	324	32	21	191
2024	1,023	302	42	5	300

Excavator Group

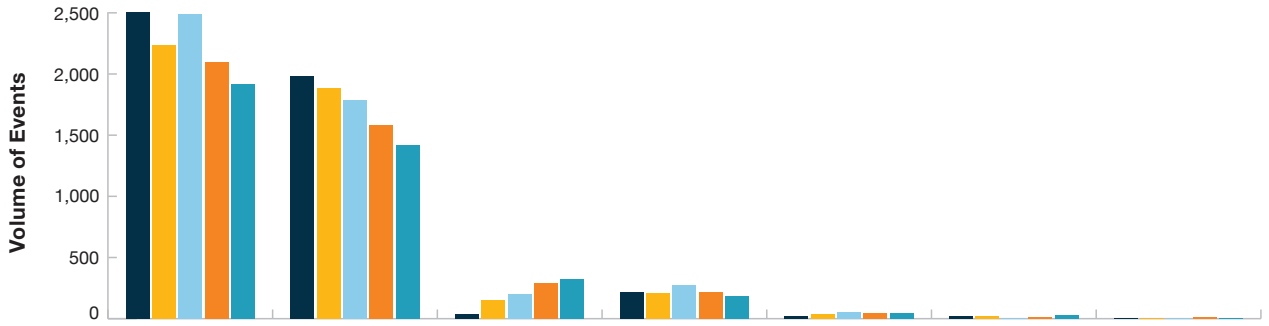
2.3 Facility Events by Stakeholder Group

Figure 6 presents a five-year analysis of events categorized by stakeholder groups, providing insight into reporting patterns and trends across different infrastructure sectors.

The data shows Natural Gas and Telecommunications stakeholders continue to be the primary reporters of events, with both sectors demonstrating significant improvements in 2024. Natural Gas events decreased by 9%, while Telecommunications events showed a 10% reduction which suggests positive outcomes from ongoing damage prevention efforts in these sectors.

Complete data from all stakeholders enables more effective identification of patterns and opportunities for improvement; broader participation in DIRT reporting from all infrastructure sectors would be valuable.

Figure 6: Facility Events by Stakeholder Group



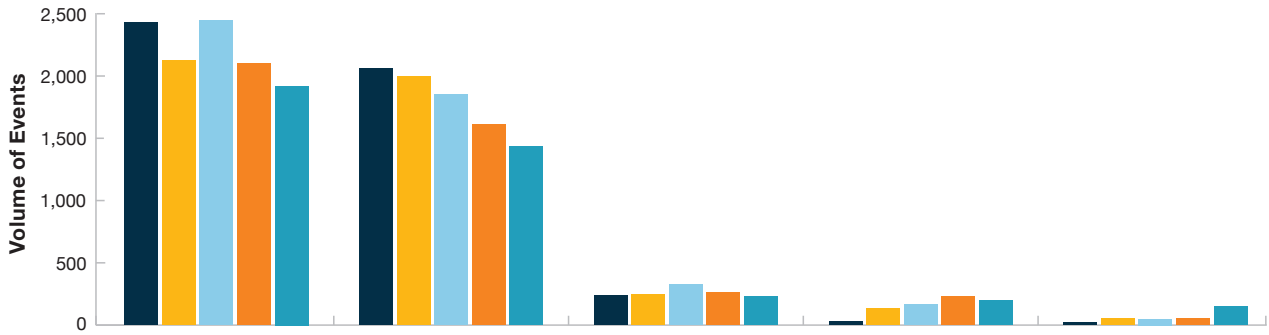
	Natural Gas	Telecommunications	Public Works	Electric	Excavator	Liquid Pipeline	Unknown/Other
2020	2,506	1,981	33	220	19	21	2
2021	2,233	1,888	150	209	40	23	11
2022	2,489	1,788	201	275	54	4	18
2023	2,097	1,585	288	215	46	11	9
2024	1,916	1,421	319	188	49	31	9

Stakeholder Group

2.4 Facility Events by Type of Facility Affected

Figure 7 demonstrates the distribution of damage events by facility type, with Natural Gas and Telecommunications infrastructure experiencing the highest frequency of reported incidents. This pattern correlates with these sectors' comprehensive reporting practices and extensive underground infrastructure networks. The consistent reporting from these two sectors provides valuable benchmark data for understanding damage prevention trends.

Figure 7: Facility Events by Type of Facility Affected



	Natural Gas	Telecommunications	Electric	Water	Unknown/Other
2020	2,428	2,062	238	31	23
2021	2,127	1,994	246	132	55
2022	2,443	1,849	323	165	49
2023	2,100	1,608	261	230	52
2024	1,920	1,435	231	199	148

Facility Affected

2.5 Excavation Equipment Group and Type

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

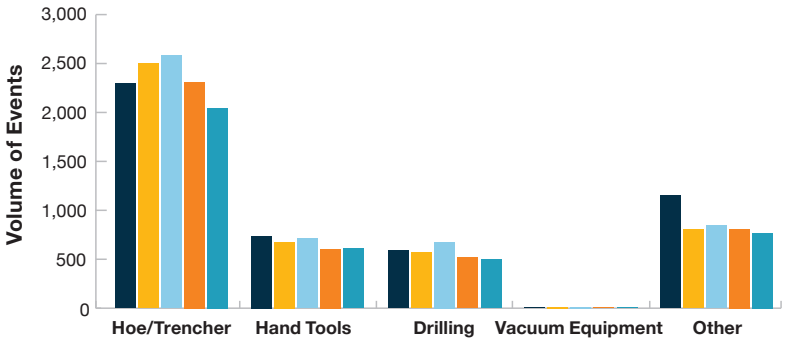
Table 3: Excavation Equipment Group and Type

Excavation Equipment 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 provides a breakdown of events triggered by different categories of excavation equipment.

The Hoe/Trencher category remained the predominant equipment group associated with damage events in 2024, through encouragingly, more equipment categories showed decreased incident rates compared to previous years.

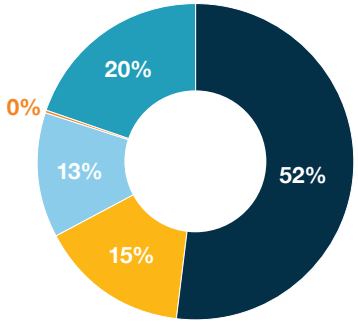
Figure 8: Facility Events by Excavation Equipment Group and Type



	Hoe/Trencher	Hand Tools	Drilling	Vacuum Equipment	Other
2020	2,296	738	589	10	1,149
2021	2,498	675	566	13	802
2022	2,583	713	677	13	843
2023	2,313	603	515	10	810
2024	2,047	607	500	9	770

Equipment Group

Figure 8a: 2024 Events by Excavation Equipment Group



Hoe/Trencher	2,047
Hand Tools	607
Drilling	500
Vacuum Equipment	9
Other	770

Table 4 presents a detailed analysis of damage events categorized by excavation equipment type, offering insights into how different excavation methods correlate with underground facility damages.

Table 4: Facility Events by Excavation Equipment Group and Type

Group & Type of Work	2020	2021	2022	2023	2024
Hoe/Trencher	**2,296**	**2,498**	**2,583**	**2,313**	**2,047**
Backhoe/Trackhoe	2,265	2,475	2,557	2,283	2,014
Trencher	31	23	26	30	33
Hand Tools	**738**	**675**	**713**	**603**	**607**
Hand Tools	727	660	691	599	601
Probing Device	11	15	22	4	6
Drilling	**589**	**566**	**677**	**515**	**500**
Auger	305	278	281	210	215
Boring	147	173	218	164	90
Directional Drilling	57	97	151	114	170
Drilling	80	18	27	27	25
Vacuum Equipment	**10**	**13**	**13**	**10**	**9**
Vacuum Equipment	10	13	13	10	9
Other	**1,149**	**802**	**843**	**810**	**770**
Bulldozer	3	4	10	3	20
Explosives	0	0	0	0	1
Farm Equipment	2	3	5	5	4
Grader/Scraper	92	78	85	94	59
Milling Equipment	0	3	2	1	5
Unknown/Other	1,052	714	741	707	681

To further enhance the value of this data analysis, more specific equipment classification in damage reports would be beneficial. The reduction of generic 'other' classifications helps identify equipment-specific trends and enables the development of more targeted damage prevention strategies.

2.6 Facility Events By Root Cause And Subcategory

Table 5 provides a comprehensive breakdown of Root Causes and their subcategories, offering critical insights into why damage events occur. This detailed categorization helps identify patterns and trends in the factors contributing to underground facility damages.

The refinement of our reporting methods has improved data consistency and reliability, enabling more accurate root cause identification.

Table 5: Root Cause and Subcategory

Root Cause	2020	2021	2022	2023	2024
Excavation Issue	**2,123**	**1,817**	**1,943**	**1,618**	**1,465**
Excavator failed to maintain clearance after verifying marks	26	56	88	753	953
Improper excavation practice not listed above	1,970	1,447	1,400	536	180
Excavator failed to protect/shore/support facilities	9	58	66	81	88
Excavator dug prior to verifying marks by test-hole (pot-hole)	29	39	60	35	79
Excavator dug after valid ticket expired	8	98	143	131	79
Excavator dug outside area described on ticket	61	82	77	69	65
Marks faded, lost or not maintained	3	11	5	6	8
Improper backfilling	3	3	2	3	8
Excavator dug prior to valid start date/time	14	23	102	4	5
Notification Issue	**1,244**	**1,239**	**1,477**	**1,265**	**1,258**
No notification made to One-Call Center / 811	1,239	1,235	1,474	1,262	1,253
Excavator provided incorrect notification information	5	4	3	3	5
Locating Issue	**255**	**348**	**340**	**297**	**269**
Marked inaccurately due to Locator error	109	101	127	106	98
Not marked due to Locator error	107	140	101	70	55
Unlocatable facility	5	34	41	53	40
Marked inaccurately due to Incorrect facility record/maps	16	35	35	3	34
Not marked due to Incorrect facility records/maps	1	9	23	21	27
Not marked due to Abandoned facility	14	5	6	10	4
Site marked but incomplete at damage location	0	6	2	5	3
Marked inaccurately due to Tracer wire issue	0	16	0	0	3
Marked inaccurately due to Abandoned Facility	3	0	1	26	3
No response from operator/contract locator	0	0	0	3	1
Not marked due to Tracer wire issue	0	2	4	0	1
Miscellaneous Root Causes	**1,160**	**1,150**	**1,069**	**1,071**	**941**
Root Cause not listed above (comment required)	1,150	1,147	1,061	1,068	939
Deteriorated facility	8	1	3	2	1
One-Call Center error	2	1	1	0	1
Previous damage	0	1	4	1	0

Figure 9 analyzes the distribution of damage events by Root Cause, revealing that Excavation Issues and Notification Issues remain the primary contributing factors to underground facility damages. This analysis highlights two key areas where enhanced damage prevention efforts could have the most significant impact:

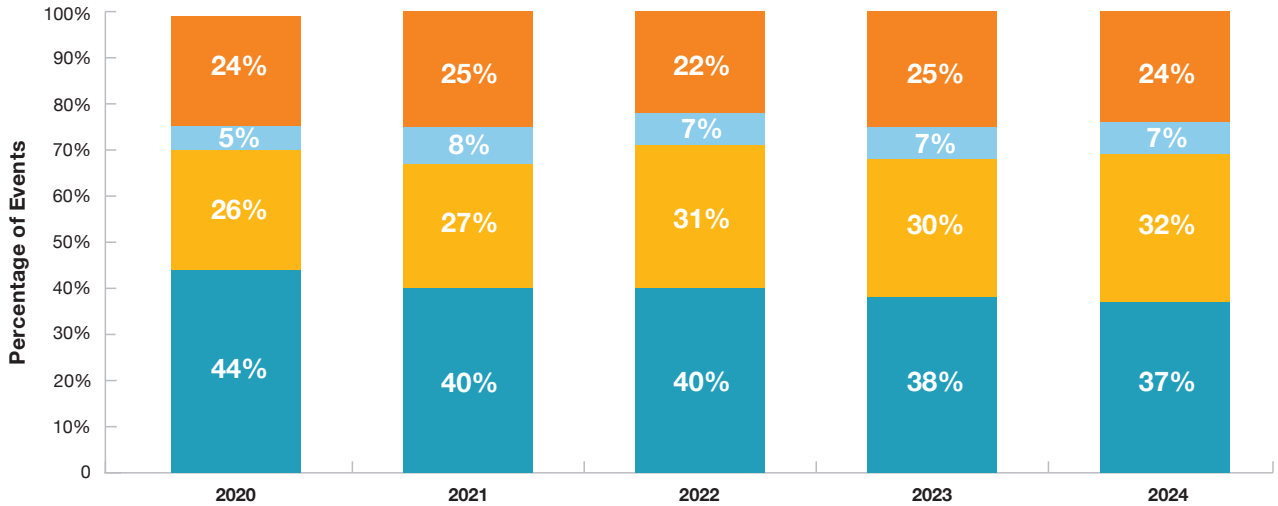
- Excavation Issues: These events typically involve deviations from safe digging practices or failure to maintain clearances around marked facilities
- Notification Issues: These events commonly result from failure to notify Ontario One Call or proceeding without a valid locate

Figure 9: Events by Root Cause

	Excavation Issue	Notification Issue	Locating Issue	Miscellaneous Root Causes
2020	2,123	1,244	255	1,160
2021	1,817	1,239	348	1,150
2022	1,943	1,477	340	1,069
2023	1,618	1,265	297	1,071
2024	1,465	1,258	269	941

Root Cause

Figure 9a: Percentage of Root Cause by Year



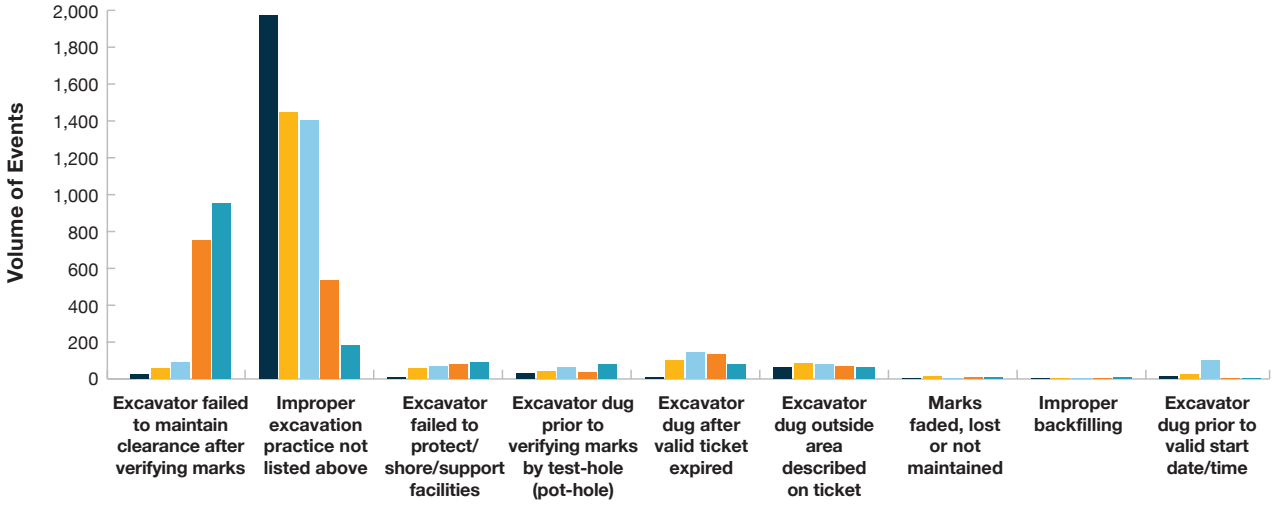
	2020	2021	2022	2023	2024
Excavation Issue	2,123	1,817	1,943	1,618	1,465
Notification Issue	1,244	1,239	1,477	1,265	1,258
Locating Issue	255	348	340	297	269
Miscellaneous Root Causes	1,160	1,150	1,069	1,071	941

Year

Figure 10 presents a five-year trend analysis of Root Cause subcategories specifically related to Excavation Issues. The data consistently identifies failure to maintain proper clearance as the leading factor in excavation-related damages.

CCGA Best Practice 4-19 (Excavation within Tolerance Zone) describes the methods to consider when exposing any underground facility.

Figure 10: Events by Root Cause: Excavation Issue



	Excavator failed to maintain clearance after verifying marks	Improper excavation practice not listed above	Excavator failed to protect/ shore/support facilities	Excavator dug prior to verifying marks by test-hole (pot-hole)	Excavator dug after valid ticket expired	Excavator dug outside area described on ticket	Marks faded, lost or not maintained	Improper backfilling	Excavator dug prior to valid start date/time
2020	26	1,970	9	29	8	61	3	3	14
2021	56	1,447	58	39	98	82	11	3	23
2022	88	1,400	66	60	143	77	5	2	102
2023	753	536	81	35	131	69	6	3	4
2024	953	180	88	79	79	65	8	8	5

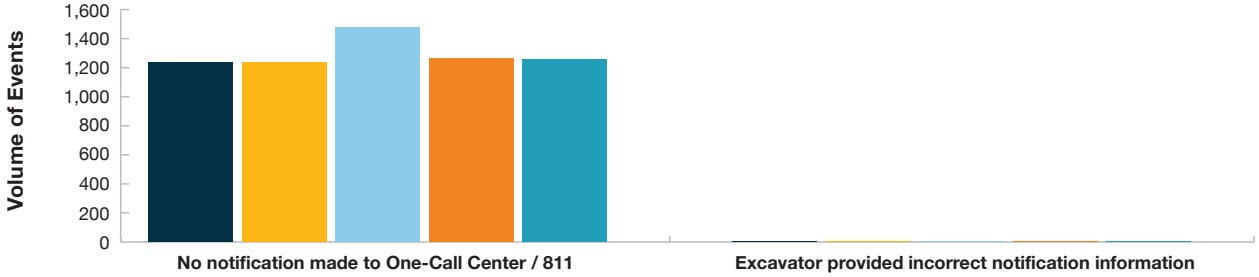
Excavation Issue by Root Cause Subcategory

Figure 11 illustrates a five-year breakdown of the Root Cause subcategories for Notification Issues. No Notification represents Events caused by no locate request being submitted to the One Call Service.

This trend data emphasizes a critical opportunity to enhance damage prevention through increased awareness of the notification process. The data consistently shows that many events could be mitigated by requesting a locate and having a complete locate package on site before beginning excavation work.

We strongly recommend referring to **CCGA Best Practice 4-1**, which states the excavator requests the location of underground facilities at each site by notifying the owner through the Notification Service. By adhering to these guidelines, we can collectively contribute to safer and more efficient excavation practices.

Figure 11: Events by Root Cause: Notification Issue



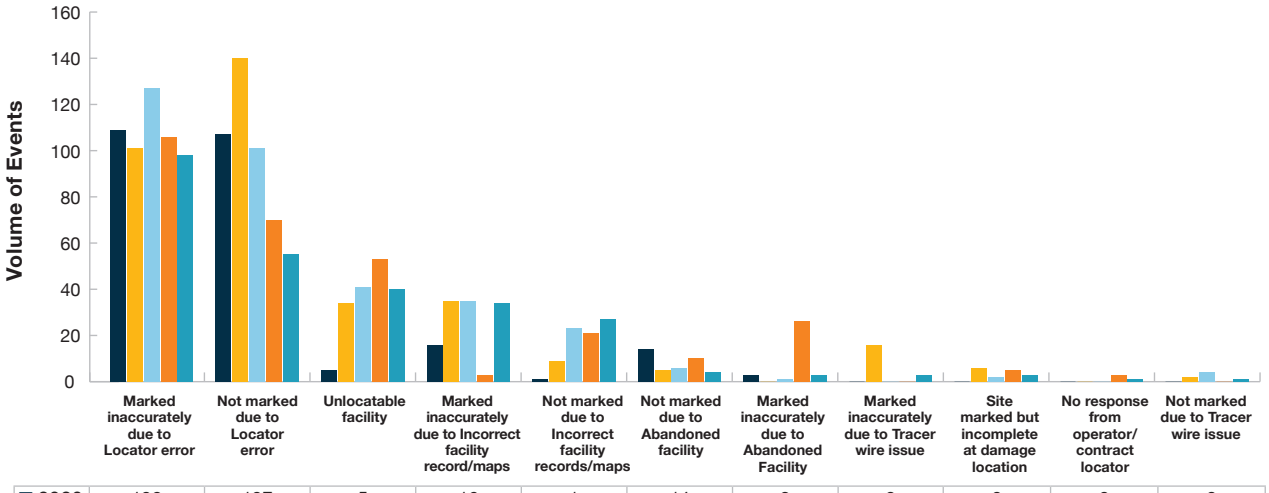
	No notification made to One-Call Center / 811	Excavator provided incorrect notification information
2020	1,239	5
2021	1,235	4
2022	1,474	3
2023	1,262	3
2024	1,253	5

Notification Issue by Root Cause Subcategory

Figure 12 presents a five-year analysis of Root Cause subcategories related to Locating Issues, providing insight into challenges and opportunities within the locating process.

The trend data highlights specific areas where locating practices can be strengthened through consistent application of industry-proven methods. We strongly recommend referring to the **CCGA Best Practice Manual Section 3** which provides a wealth of best practices specifically designed to assist in Locating and Marking. Implementation of these established best practices by all stakeholders can lead to more accurate locates, reduced damage incidents, and enhanced safety for workers and the public.

Figure 12: Events by Root Cause: Locating Issue



	Marked inaccurately due to Locator error	Not marked due to Locator error	Unlocatable facility	Marked inaccurately due to Incorrect facility record/maps	Not marked due to Incorrect facility records/maps	Not marked due to Abandoned facility	Marked inaccurately due to Abandoned Facility	Marked inaccurately due to Tracer wire issue	Site marked but incomplete at damage location	No response from operator/ contract locator	Not marked due to Tracer wire issue
2020	109	107	5	16	1	14	3	0	0	0	0
2021	101	140	34	35	9	5	0	16	6	0	2
2022	127	101	41	35	23	6	1	0	2	0	4
2023	106	70	53	3	21	10	26	0	5	3	0
2024	98	55	40	34	27	4	3	3	3	1	1

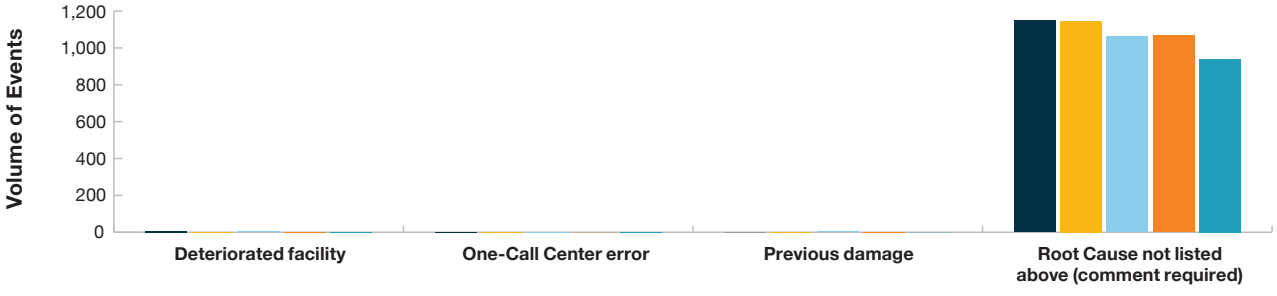
Locating Issue by Root Cause Subcategory

Figure 13 analyzes the distribution and trends of subcategories related to Miscellaneous Root Causes over a five-year period, with particular attention to classification patterns in damage reporting.

While the data shows an encouraging 12% reduction in the use of 'Root Cause Not Listed Above', this category remains the most frequently cited among Miscellaneous Root Causes.

To maximize the value of damage data analysis, reporters are encouraged to select the most specific applicable root cause category when documenting incidents. This level of detail strengthens our collective ability to prevent future damages through targeted interventions.

Figure 13: Events by Root Cause: Miscellaneous



	Deteriorated facility	One-Call Center error	Previous damage	Root Cause not listed above (comment required)
2020	8	2	0	1,150
2021	1	1	1	1,147
2022	3	1	4	1,061
2023	2	0	1	1,068
2024	1	1	0	939

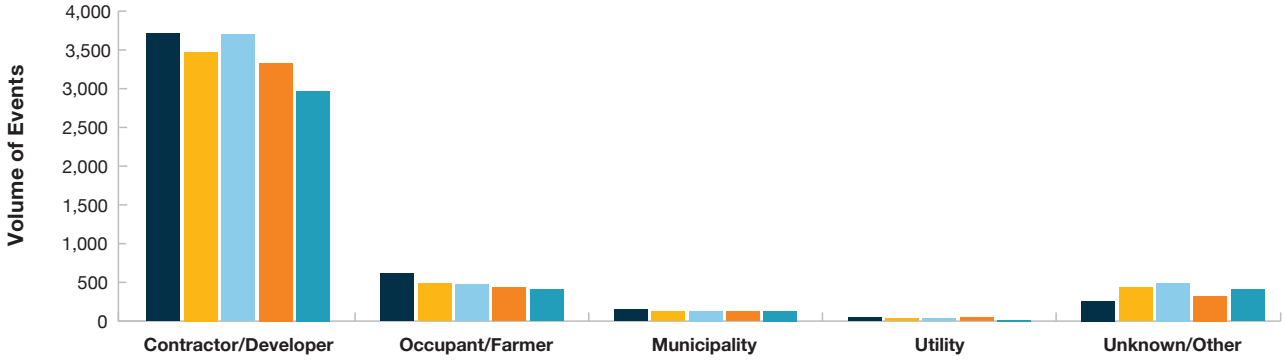
Miscellaneous Root Cause by Subcategory

2.7 Events by Excavator Group

Figure 14 illustrates the distribution of events by Excavator Group showing that Contractor/Developer continues to be involved in the majority of reported events, contributing to 76% of the events in 2024 which represents a slight decrease from 2023.

Enhancing damage prevention performance in Ontario is a crucial task. To achieve this, we must thoroughly understand the parties involved in reported events. By doing so, we can create effective educational tools tailored to their specific needs. For a deeper understanding, we invite you to explore the comprehensive analysis provided in Section 3.0 (Multi-Field Analysis) of this report. This section offers valuable insights that can significantly contribute to our collective goal of damage prevention.

Figure 14: Events by Excavator Group



	Contractor/Developer	Occupant/Farmer	Municipality	Utility	Unknown/Other
2020	3,717	612	145	47	261
2021	3,474	485	129	32	434
2022	3,698	470	132	37	492
2023	3,332	431	122	42	324
2024	2,971	412	130	15	405

Excavator Group

2.8 Events by Work Group and Type of Work

Table 6 provides a comprehensive analysis of work types over a five-year period, revealing key patterns in facility events.

Notable trends emerged in two categories:

- The Utility sector showed the most significant improvement, with a substantial 26% reduction in events
- Unknown/Other category experienced a slight uptick, increasing by 5%

Understanding these patterns helps identify where additional focus may be needed.

Table 6: Work Group and Type of Work

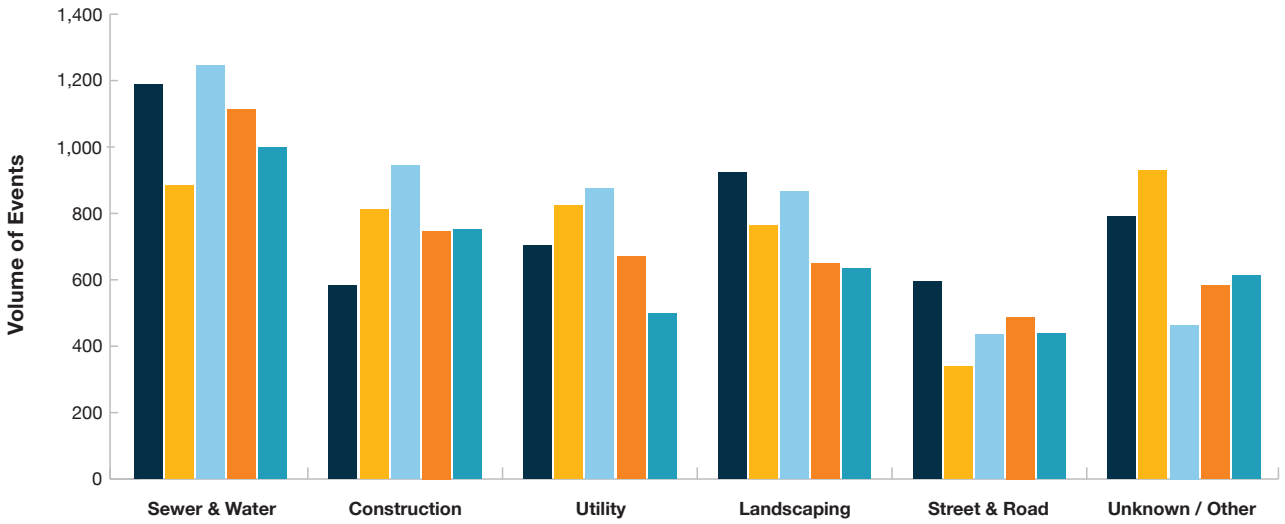
WORK GROUP & TYPE OF WORK	2020	2021	2022	2023	2024
Sewer & Water	1,187	884	1,246	1,113	994
Sewer	625	602	718	653	536
Drainage	173	28	293	262	268
Water	389	254	235	198	190
Construction	**583**	**813**	**944**	**747**	**751**
Bldg. Construction	291	553	683	511	553
Driveway	168	141	165	148	100
Site Development	70	85	58	53	56
Bldg. Demolition	11	13	23	13	26
Grading	43	21	15	22	16
Utility	**703**	**825**	**875**	**671**	**494**
Telecommunications	302	403	502	400	284
Electric	255	233	231	196	161
Natural Gas	145	189	136	75	52
Liquid Pipeline	1	0	6	0	0
Landscaping	**923**	**763**	**865**	**649**	**631**
Fencing	496	413	481	333	357
Landscaping	404	332	358	295	249
Waterway Improvement	10	6	15	7	6
Irrigation	11	10	6	13	14
Agriculture	2	2	5	1	5
Street & Road	**594**	**340**	**435**	**488**	**433**
Road Work	387	193	197	251	186
Curb/Sidewalk	114	58	114	102	80
Storm Drain/Culvert	44	63	95	111	129
Pole	24	8	6	9	16
Traffic Sign	16	5	6	7	5
Street Light	3	3	6	4	4
Traffic Signal	1	6	5	3	5
Public Transit Authority	2	1	5	0	3
Railroad	3	3	1	1	4
Milling	0	0	0	0	1
Unknown / Other	**792**	**929**	**464**	**583**	**612**
Unknown/Other	791	928	459	580	610
Engineering/Surveying	1	1	5	3	2

Figure 15 presents a detailed breakdown of events categorized by work group.

Sewer and Water operations remained the leading source of facility events with 994 incidents, closely followed by Construction activities with 751 events. Together, these two sectors were responsible for nearly half (45%) of all reported events in 2024.

We strongly advocate for minimizing the use of the Unknown/Other category, as it enhances the precision and reliability of our data. This would ensure that our data reflects the most accurate and informative insights.

Figure 15: Events by Work Group



	Sewer & Water	Construction	Utility	Landscaping	Street & Road	Unknown / Other
2020	1,187	583	703	923	594	792
2021	884	813	825	763	340	929
2022	1,246	944	875	865	435	464
2023	1,113	747	671	649	488	583
2024	999	752	498	633	439	612

Work Group

REMINDER

In order to improve the overall completeness of submissions, the committee is advising submitters to:

Submit events in a timely manner

It is recommended that Damage Information Reporting Tool (DIRT) data is submitted on a monthly or bi-monthly basis, so the events are fresh in your memory and details are easy to recall.

Complete the Late Locate Question

Although this is not mandatory it is strongly recommended that submitters answer to the best of their ability in order to gather enough data to determine if there is a relationship between facility events and late locates.

Unknown/Other

It is the goal of this report to provide as much insight as possible for all stakeholders. Usage of the "unknown/other" categories limits our ability to provide clear measurable data.

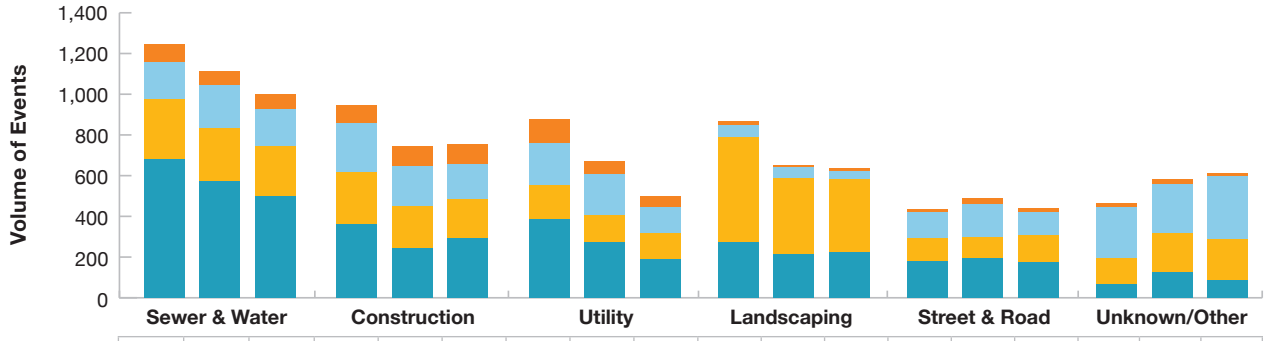
3.1 Analysis of Events by Root Cause and Work Group

Figure 16 delivers a multi-year analysis of root causes across six major work groups: Sewer and Water, Construction, Landscaping, Utility, Street & Road, and Unknown/Other. These groups represent a broad spectrum of operations, each with its unique challenges and circumstances.

Our three-year analysis (2022-2024) reveals distinct patterns within each sector, highlighting how different types of work present unique damage prevention challenges.

In summary, these charts serve as a valuable tool for understanding the root causes of events across a diverse range of work groups over a significant period. They provide a balanced and detailed view, allowing for informed decision-making and strategic planning.

Figure 16: Events by Root Cause and Work Group



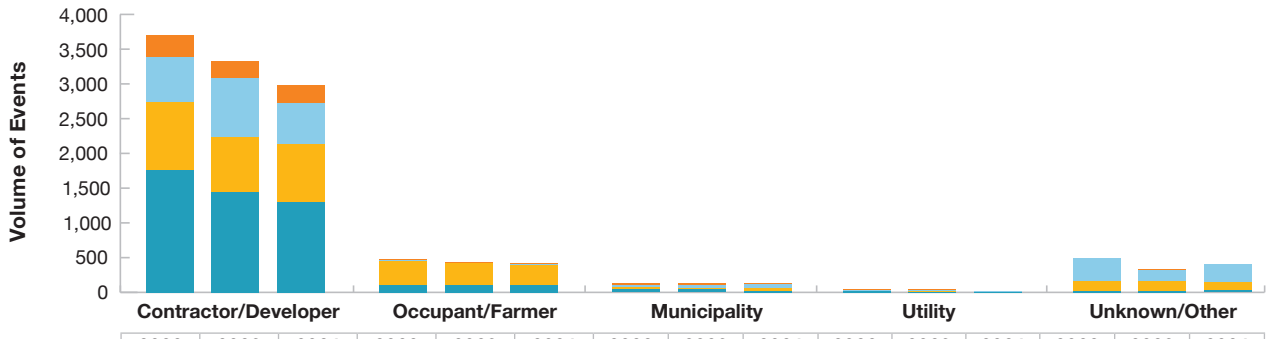
	Sewer & Water			Construction			Utility			Landscaping			Street & Road			Unknown/Other		
	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024
Locating Issue	87	70	72	86	98	99	118	63	56	16	10	10	15	28	16	18	28	16
Miscellaneous Root Causes	186	212	180	241	200	168	203	202	128	62	52	40	128	164	117	249	241	308
Notification Issue	295	259	249	254	207	195	167	134	124	515	375	360	114	102	130	132	188	200
Excavation Issue	678	572	498	363	242	290	387	272	190	272	212	223	178	194	176	65	126	88

Work Group

Figure 17 reveals key insights about excavator-related events: Contractor/Developer activities remain the leading source of excavation-related events, though 2024 showed an encouraging downward trend in this category. This reduction suggests that recent safety initiatives and educational efforts may be having a positive impact.

The trends identified provide a foundation for evidence-based decision-making and strategic planning across all excavator groups.

Figure 17: Events by Root Cause and Excavator Group



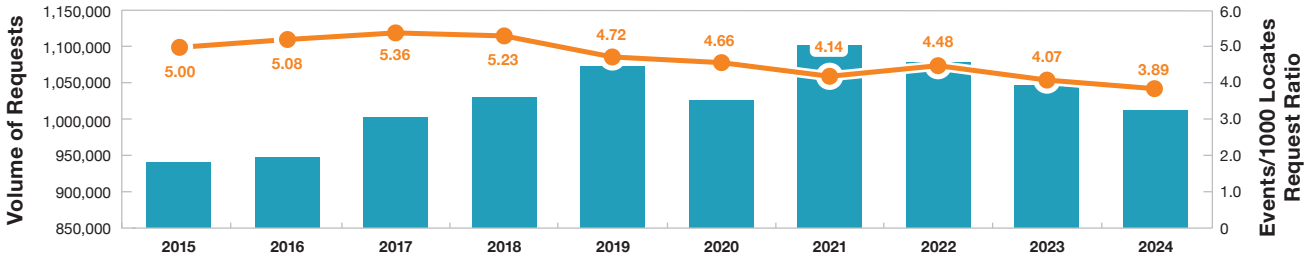
	Contractor/Developer			Occupant/Farmer			Municipality			Utility			Unknown/Other		
	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024	2022	2023	2024
Locating Issue	310	259	247	1	6	5	22	17	13	4	12	1	3	3	3
Miscellaneous Root Causes	659	837	598	24	11	15	39	40	61	13	17	8	334	166	259
Notification Issue	966	791	821	344	311	285	29	23	33	2	7	2	136	133	117
Excavation Issue	1,763	1,445	1,305	101	103	107	42	42	23	18	6	4	19	22	26

Excavator Group

Figure 18 presents a 10 year analysis of Events per 1000 locate requests, this long-term perspective reveals how event rates can fluctuate in response to various factors, including construction cycles, economic conditions, and the effectiveness of public awareness campaigns.

Understanding these patterns helps us better anticipate and respond to changing industry conditions, ultimately supporting our goal of reducing facility events across all sectors. The historical data demonstrates that damage prevention is not a static goal but rather an evolving challenge that requires sustained attention and adaptation. These trends underscore the importance of maintaining robust educational programs, fostering stakeholder engagement, and continuously evaluating and refining our prevention strategies.

Figure 18: Damages/1000 Locate Requests



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Requests	939,682	946,494	1,002,173	1,029,592	1,071,928	1,025,432	1,101,025	1,077,779	1,045,578	1,012,207
Events/1000 Locates Request Ratio	5.00	5.08	5.36	5.23	4.72	4.66	4.14	4.48	4.07	3.89

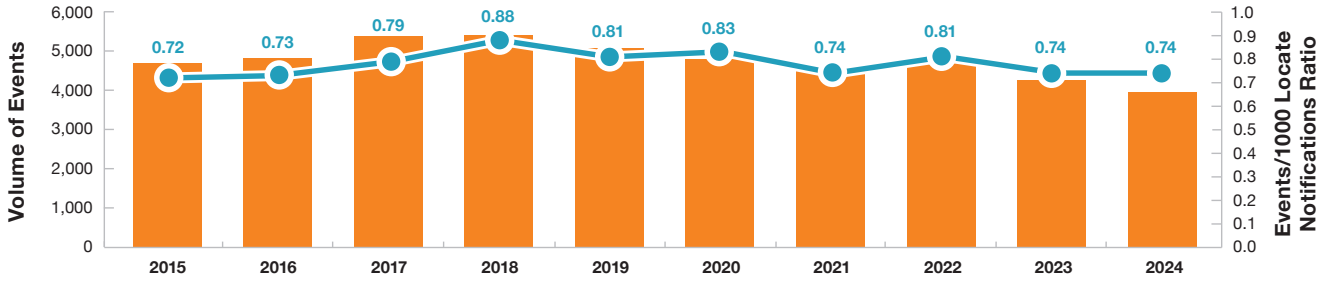
Year

Figure 19 provides a comprehensive visualization of the event ratio in relation to the volume of events spanning the past 10 years.

The industry standard for assessing damage prevention performance is to evaluate the volume of events per thousand notifications. This metric offers a normalized measure that allows for meaningful comparisons and benchmarking, irrespective of the scale of operations.

For outbound notification from Ontario One Call, a higher number of notifications indicate a greater number of utilities at risk for a given locate request. Conversely, for inbound locate requests to Ontario One Call, the high number of requests indicates both a heightened awareness to “Click Before You Dig”, as well as an increased level of construction activity. These factors further emphasize the need for vigilance in managing notifications and damages in the industry.

Figure 19: Damages/1000 Locate Notifications



	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Events	4,695	4,806	5,367	5,388	5,061	4,783	4,554	4,829	4,251	3,933
Events/1000 Locate Notifications Ratio	0.72	0.73	0.79	0.88	0.81	0.83	0.74	0.81	0.74	0.74

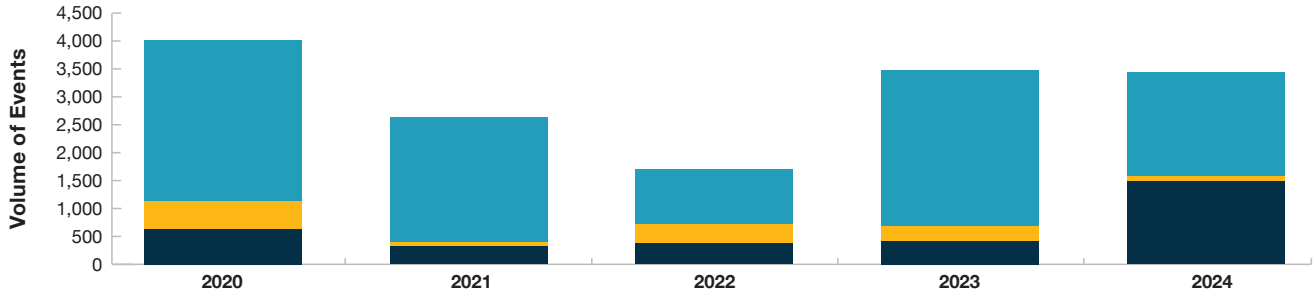
Year

Figure 20 addresses a industry challenge: Late Utility Locates. In response to this growing concern, the DIRT Report began tracking locate completion times in 2020, asking a simple but crucial question: 'Was the locate completed within the required timeframe?' The data collection uses a straightforward Yes/No/Unknown response system to track performance.

While this initiative represents an important step forward in understanding and addressing locate delays, current response rates remain below optimal levels. Our analysis begins from November 2020, meaning the first year's data is partial. However, even with limited data, the trends reveal a pressing need for improved reporting compliance across all stakeholder groups. Utilities, as key players in this ecosystem, are particularly positioned to strengthen data quality through consistent and accurate reporting.

Quality data drives effective solutions. As we work to address locate delays across Ontario, comprehensive reporting from all stakeholders becomes not just beneficial, but essential. We encourage all industry partners to prioritize accurate and timely data submission, ensuring our collective strategies are built on solid evidence rather than assumptions.

Figure 20: Was the Locate Completed Within the Required Timeframe?



	2020	2021	2022	2023	2024
Unknown	2,875	2,225	989	2,784	1,851
No	510	83	343	263	103
Yes	627	322	371	424	1,483

Locate Completed on Time

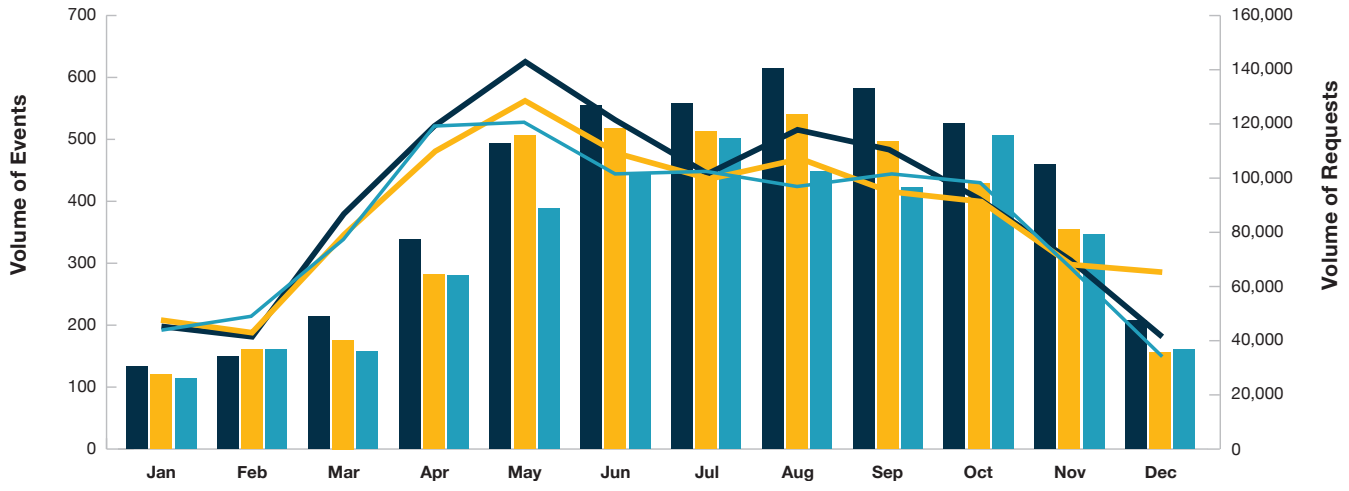
Figure 21 provides a detailed three-year analysis of the distribution of locate requests and damage incidents. This analysis offers valuable insights into the timing and correlation of these two key operational aspects.

The data reveals that the highest volume of locate requests in 2024 was recorded in May, suggesting a surge in planned activities during this period.

However, the peak of damage incidents did not coincide with the peak of locate requests. Instead, the highest number of damage incidents was observed in October. This shift between the peaks of locate requests and damage incidents could be attributed to various factors, including the time required for planning and executing operations after locate requests, and potential delays in reporting and recording damage incidents.

In summary, this graph offers a nuanced understanding of the dynamics between locate requests and damage incidents over time. The distinct peaks in July and October highlight the importance of continuous monitoring and proactive management to mitigate damages and enhance operational efficiency.

Figure 21: Events Versus Requests by Month



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022 Events	133	149	214	338	493	555	558	614	582	526	459	208
2023 Events	120	161	176	282	506	517	513	540	497	428	355	156
2024 Events	114	161	157	280	388	447	502	448	423	506	346	161
2022 Requests	44,772	41,706	86,199	119,258	143,027	120,864	101,199	116,365	109,252	90,141	66,862	38,134
2023 Requests	47,465	43,336	78,952	109,729	129,356	109,493	99,957	107,111	95,287	91,389	68,191	65,312
2024 Requests	43,486	49,150	77,128	118,612	120,622	101,555	102,315	96,922	101,610	98,530	67,705	34,565

Through examination of damage incident data spanning three-years, we uncovered a significant trend in occurrence patterns across different days of the week. Our analysis reveals that Tuesday and Wednesday continue to stand out with the most pronounced frequency of damage events.

Figure 22: Events by Day of the Week 2022-2024

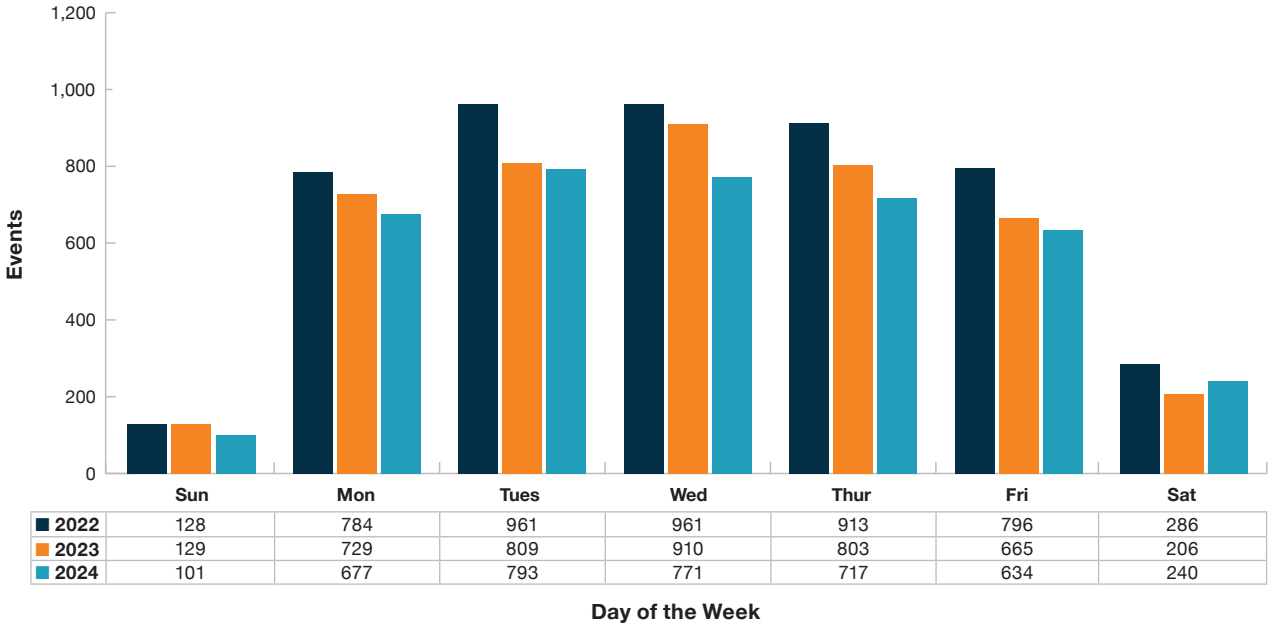


Table 7 illustrates events by day of the week broken out by Excavator Group over a three year period.

Table 7: Events by Day of the Week by Excavator Group 2022-2024

Events	Excavator Type				
Day of Week	Contractor / Developer	Occupant / Farmer	Municipality	Utility	Unknown / Other
Sunday	45%	37%	3%	1%	15%
Monday	78%	9%	3%	1%	9%
Tuesday	80%	6%	4%	1%	9%
Wednesday	80%	7%	3%	1%	9%
Thursday	80%	8%	3%	1%	8%
Friday	76%	10%	3%	1%	10%
Saturday	55%	31%	2%	0%	12%

***Disclaimer:** Percentage may not equal 100% due to rounding

Report Findings: Data Quality Index

Table 7 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 75%.

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 "2024 DQI" column in the table below represents the average of all 3,933 submitted events in the 2024 dataset.

Table 7: DIRT Submission Parts and DQI

DIRT Parts	Relative Weight	2022 DQI	2023 DQI	2024 DQI
A: Who is submitting this information?	5%	100.0	100.0	100.0
B: Date and Location of the Damage	12%	78.4	78.0	80.1
C: Affected Facility Information	12%	78.8	78.4	78.3
D: Excavation Information	14%	88.2	87.4	85.7
E&F: Notification, Locating, Marking	12%	100.0	100.0	100.0
G: Excavator Downtime	6%	13.2	15.8	22.0
H: Description of Damage	14%	33.8	32.5	34.3
I: Description of the Root Cause	25%	78.0	74.9	76.1
Total Weighted DQI	**100%**	**75.7**	**74.3**	**75.0**

In the context of damage reports, there are numerous sections that require careful attention. However, it is noteworthy that Parts G and H, which pertain to Excavator Downtime and Description of the Damage respectively, are frequently omitted. This omission is not due to oversight, but rather because more organizations that contribute data to the Damage Information Reporting Tool (DIRT does not routinely monitor or record this specific information). As a result, these sections often remain blank, leading to a potential gap in the comprehensiveness of the report.

4.0 | CCGA Regional Partner Data

4.1 | CCGA Regional Partner Data

In 2023, damage reports submitted through the DIRT system across Canada decreased to 9,994 events, marking a 6% reduction from the 10,636 recorded in 2022. When analyzed on a daily basis, this translates to an average of 40 damage incidents per workday, calculated using the standard 251 working days in a year. Table 6 provides a comprehensive breakdown of key performance indicators, detailing damage occurrences by Province/Region.

Table 6 – Summary by Province/Region, 2023

PROVINCE/ REGION	% of Population‡	Damages	% of Damages	Damages per Work Day	Locate Requests	Damages per 1,000 Requests*	Locate Notifications	Damages per 1,000 Notifications**
British Columbia	14%	1,065	11%	4	229,121	4.65	668,968	1.59
Alberta	12%	3,173	32%	13	447,482	7.09	1,514,605	2.09
Saskatchewan	3%	615	6%	3	147,555	4.17	406,524	1.51
Manitoba	4%	202	2%	1	81,619	2.47	200,868	1.01
Ontario	39%	4,225	42%	17	1,098,999	3.84	6,486,733	0.65
Quebec	22%	696	7%	3	306,184	2.27	518,016	1.34
Atlantic	6%	18	0%	<1	68,450	0.26	71,307	0.25
Canada	**100%**	**9,994**	**100%**	**40**	**2,379,410**	**4.2**	**9,867,021**	**1.01**

* 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: Ticket data transmitted to underground infrastructure owners.

Ontario is the only province with legislation mandating registration with a One-Call Centre.

1 The Role of GPS Technology in Transforming Damage Prevention for Utility Management

By Shane Hart, Senior Damage Prevention Specialist

Introduction

In the field of utility management, effective damage prevention is critical - not just to protect essential infrastructure, but to ensure the safety of workers and the public. Damage to underground utilities can lead to serious injuries, costly repairs, and disruptions in service that affect entire communities. Traditional methods of utility mapping often fall short in accuracy and accessibility, leading to errors that can be prevented with modern technology.

This is where GPS technology comes into play as a transformative tool that enhances damage prevention efforts. By leveraging high-accuracy GPS mapping and user-friendly digital tools, utility companies can improve coordination, minimize damages, and ultimately make projects safer and more efficient.

The Challenges of Uncoordinated Utility Mapping

One of the primary challenges in utility management is the issue of unmarked or poorly mapped utility lines. When utility lines are inaccurately mapped - or, worse, unmarked - the risk of accidental damage during excavation rises dramatically. Every time a contractor digs without precise information on underground utilities, they risk hitting pipes, cables, or other infrastructure, leading to potential hazards like gas leaks, power outages, telecommunications or water service disruptions.

The financial impact of excavation errors is substantial, with unexpected repairs, project delays, and insurance claims adding up quickly. Beyond these costs, there's a serious safety risk to both crews and the public. We also need to consider the broader financial impact on society, which can exceed the repair cost by as much as 80%. In today's complex infrastructure landscape, accurate mapping isn't just a best practice - it's a critical necessity. Preventing utility damage safeguards lives, reduces costly disruptions, and protects valuable investments.

The Power of GPS Precision in Mapping Utility Lines

One of the greatest advantages of GPS technology in utility management is the exceptional precision it offers. Traditional mapping methods can have inaccuracies of several metres, but GPS provides data with an accuracy within just a few metres. With Real-Time Kinematic (RTK) technology, this precision can be refined to within a few centimetres. Such accuracy enables utility operators to produce highly detailed maps that significantly enhance the safety and efficiency of excavation projects.

Having maps accurate to within a few centimetres of underground utility assets not only reduces the risk of accidental strikes but also streamlines project planning and boosts efficiency. When these maps are shared as accessible files—like Google Earth files—they become invaluable tools for collaboration. Stakeholders, including contractors and city planners, can access current data on underground infrastructure, supporting better communication throughout every stage of the project.

The future of utility management rests on transparency and collaboration, and GPS technology drives this evolution by making precise utility information readily available and easy to share.

GPS-Enabled Pipe and Cable Locators: A Key Part of Damage Prevention

In addition to static mapping, GPS-enabled locate equipment allows real-time tracking and data collection in the field. These tools use GPS to accurately identify and log the positions of pipes and cables, significantly increasing accuracy, efficiency, and safety in locating underground infrastructure during excavation projects. Field crews can locate utilities precisely and document their findings, creating a digital record that can be accessed for future projects or reference.

Some organizations have already begun implementing GPS-enabled locator wands with impressive results. For example, one utility company saw a significant reduction in excavation incidents after switching to GPS-based location tools, which allowed crews to avoid lines they might not have been aware of otherwise. Investing in GPS locate technology is more than just an efficiency boost - it's an investment in safety. Every utility should take this step seriously as part of a robust damage prevention strategy.

Affordable and User-Friendly Mapping Solutions

One of the most exciting aspects of modern GPS utility mapping solutions is their affordability and accessibility. Today's GPS hardware and mapping software are designed with user experience in mind, making it easy for even those new to the field to perform professional-level mapping. This accessibility is essential because it encourages wider adoption, allowing both seasoned professionals and newcomers to improve accuracy in their work.

Affordable, easy-to-use GPS technology empowers a new generation of utility professionals who understand the importance of precise mapping and safety. With these tools at their disposal, the industry as a whole moves closer to a culture of damage prevention, where precision is prioritized over guesswork.

Conclusion

GPS technology has the potential to significantly reduce utility damages and improve overall utility management. By offering precise, accessible mapping solutions, GPS enables utilities to better coordinate efforts, reduce risks, and create safer, more efficient projects.

For utilities, embracing GPS mapping solutions means promoting a culture of safety and efficiency - a shift that will benefit everyone involved. In an industry that must constantly adapt, those who leverage advanced technology will not only survive but thrive. Let's ensure we're on the right path toward a safer and more reliable infrastructure network, with GPS paving the way for the future of damage prevention.

2 Top 10 Canadian construction trends to watch in 2025

What are some of the continuing and emerging themes to watch for in the coming 12 months? Canadian Construction Association President Rodrigue Gilbert shares some of the items on his radar.

By Rodrigue Gilbert

As we approach 2025, the Canadian construction industry is on the cusp of transformative changes driven by advancements in technology, shifting demographics, and evolving policy and regulatory landscapes. Here are the top 10 trends and policy issues that our organization feels will significantly impact the industry in the coming years.

1. ELECTION: A PRIME TIME TO SPOTLIGHT CONSTRUCTION

As election season heats up, there is an opportunity for conversations around a national infrastructure strategy to take centre stage. The total investment needed to meet Canada's housing targets and develop supporting infrastructure could run into the billions of dollars annually.

Canada's existing, not to mention aging, infrastructure is not prepared for the additional stress. A comprehensive, balanced approach is needed to meet housing targets, repair or replace our aging infrastructure, build for tomorrow, and address labour challenges. With candidates campaigning, now is the time for the industry to work together to elevate infrastructure in national discussions.

2. BUILDING GREEN: THE FUTURE IS SUSTAINABLE!

Sustainability is no longer optional. The Canada Green Building Council predicts that green construction will make up 25 per cent of the market by 2025. Construction firms have already been embracing the shift to sustainable practices, adopting green materials, energy-efficient systems, and waste-reduction strategies.

Since 2005, energy emissions in construction have decreased by approximately 16.5 per cent and GHG emissions related to the production of aluminum, cement and steel have seen a drop by 43.5 per cent, 41.6 per cent and 26.5 per cent, respectively. These are huge successes!

Governments can help move the needle further with incentives to help industry comply with new building codes and green standards.

3. OPTIMIZING DELIVERY AND COST MANAGEMENT: THE POWER OF IPD

Collaboration is key! The trend towards Integrated Project Delivery (IPD) models is gaining momentum, encouraging collaboration among contractors, architects, and owners. Studies have shown that IPD can reduce project delivery times and improve cost predictability. As firms recognize the benefits of shared risks and rewards, this collaborative approach will become more prevalent, fostering innovation and efficiency throughout the industry.

4. BUILDING FOR TOMORROW: RESILIENCE AND CLIMATE ADAPTATION

As extreme weather events become more frequent, the focus on building resilient infrastructure will intensify.

A 2022 report from the Insurance Bureau of Canada found that climate-related damages could cost the country up to $139 billion by 2030. Expect stricter building codes and increased government funding for climate-adaptive projects.

The construction industry has been advocating for these changes for some time to spur innovation and investment in resilient construction methods – because tomorrow's infrastructure must withstand the storms of today.

5. LABOUR SHORTAGES: BOLD GOVERNMENT ACTIONS ARE NEEDED

Canada continues to face a crippling labour crisis across several industries. Without a long-term plan to secure the workforce we need, the construction sector will not be able to meet the needs of Canadians.

With over 30 per cent of construction workers nearing retirement age, industry stakeholders and government agencies will need to work harder to promote careers in construction.

A well-balanced immigration policy that includes a re-evaluation of the current points system and considers the unique needs of our provinces can help ensure that we fill the labour gaps, appropriately, in our sector.

6. THE DIGITAL REVOLUTION

It's time to embrace technology. In the fast-paced world of Canadian construction, where deadlines loom and accuracy is paramount, effective document management can make or break a project.

This is why the Canadian Construction Association (CCA) has taken a leap forward by developing a digital contract lifecycle management solution designed specifically for standard construction documents (CCDC and CCA) in Canada.

With SignaSur, all stakeholders, including contractors, consultants and owners, will be able to create, collaborate and seal contracts in one cohesive platform, revolutionizing the way documents are handled in the field.

7. POLICY SHIFTS AND REGULATORY FRAMEWORKS

Upcoming changes to building codes and zoning regulations will significantly impact project timelines and costs. The Canadian government is reviewing the National Building Code to improve energy efficiency, which may necessitate additional investments from builders. Municipalities are also increasingly adopting policies to promote urban density and affordable housing, compelling developers to rethink traditional construction approaches.

8. MODULAR MAGIC: THE RISE OF PREFABRICATION

Modular and prefabricated construction is projected to grow significantly. These methods not only reduce construction time; they also minimize waste, lower labour costs and align with sustainable building goals.

Initiatives such as Canada's National Housing Strategy are promoting modular construction to address the housing crisis, making this approach more appealing to developers and municipalities. And with our long Canadian winters, building significant portions of a structure within the confines of a factory has the added benefit of mitigating weather delays.

9. CYBERSECURITY: BATTLING DIGITAL THREATS

As digital adoption increases, so do cybersecurity risks. A study by the Ponemon Institute revealed that 57 per cent of construction firms have experienced a data breach in the last two years.

As the importance of cybersecurity grows, companies will need to invest in robust systems to protect sensitive project data and client information. Regulatory bodies may also introduce new compliance requirements to safeguard industry data.

10. BOOSTING EFFICIENCY AND COLLABORATION

Digital tools are revolutionizing project management. A 2020 study by McKinsey & Company found that companies that fully digitize their processes could improve productivity by up to 20 per cent.

Technologies such as Building Information Modelling (BIM) are now being integrated into over 70 per cent of projects, enabling better visualization and collaboration among stakeholders. As more firms adopt digital solutions, the construction landscape will become increasingly interconnected and efficient.

Rodrigue Gilbert is the president of the Canadian Construction Association.

(This article first appeared in the December 2024 edition of **On-Site Magazine**.)

3 Women in Utilities

By Elaine Gilliland, B.Sc. (she/her/hers) Director, Water & Wastewater Operations

Region of Peel
working with you

Utilities across North America are being faced with a huge challenge over the next 5 years, as an estimated 50% of staff in some utility sectors are meeting the retirement age. How are utilities going to meet these increased staffing demands to ensure a seamless service delivery?

Traditionally in utilities, especially in the field, the work has always been perceived as “too heavy, too dirty, too dangerous” and has been a detraction from women applying for roles.

Times have changed, and we are continuing to see changes in the number of young women enrolled and graduating from the science, technology, engineering and math (STEM) programs at colleges and universities, and entering the trades. Currently approximately 30% of all STEM students are female versus 30 years ago when it was less than 10%. Trades have approximately 10% of entering staff being women.

There are so many benefits to a gender diverse workforce:

Innovation - Diverse teams are often found to be the outside of the box thinkers and challenge not only one another but conventional thoughts, processes and approaches. Having the different perspectives allows for better brainstorming as you do not have everyone in the same linear thought and decision-making processes.

Decision Making – Having a diverse team brings together different perspective and viewpoints and these differences allow risks and challenges to be identified while at the same time ensuring solid decisions are made.

Customer Satisfaction – Through studies it has been found that diversity increases job satisfaction and promotes a positive work environment. Having diverse experiences allow staff and customers to relate to one another which may improve relationships. Happy and engaged employees have an increased commitment to the job and to the company’s success. That translates to better customer service, better customer satisfaction while at the same time increasing the company’s reputation.

Service Delivery – Contributing to the customer satisfaction is service delivery. Having a diverse team brings varied expertise together, including empathy and other valuable skills. Exposing team members to how others deal with and address situations, provides invaluable learning and mentoring, leading to increased engagement.

But the question becomes, how do we get women and gender diverse persons to really look at the world of utilities as viable careers? What are the barriers, real or perceived, for them coming into the world of utilities?

The 4 stages in an employee career cycle are Attraction, Recruitment, Retention and Advancement. How do we tap into making the utility world a place that is gender diverse; a place where women want to work and can contribute?

Attraction – The ‘traditional’ gender roles marked through our societal norms need to be broken. People often hear and learn about roles through word of mouth, a friendly referral, or they stumble across reading about it online. Many wonder if that is the right path for them.

Is it a female friendly role? How can we do a better job at this? Introducing the utility's gender diverse roles available within a community is important. Getting out to career days at high schools, trade schools, colleges and universities helps to get the message out that there are viable career options for all to consider.

How do we create excitement about the future of women in utilities? Examples might be tours of control centers, equipment on site from a few water valves through to linemen and fiber splice equipment. Seeing, touching and having the ability to ask questions and have the answers come from those in the field is powerful.

Recruitment - For more and more students, when they finish school, the first job they are seeking is their first full time employment anywhere. One way to reach more female applicants is through targeted sourcing strategies. Many companies will target candidates or demographics to ensure that women/BIPOC/LGBTQ2S members are properly represented as part of the team. Ensuring job ads have gender neutral language will assist with the attraction of all qualified candidates. Provide education to the leadership team responsible for hiring to look beyond biases. Look for the quality in the applicant and reinforce that diversity on the team will only make the team stronger. Job postings are posted on speciality trade web sites as well as on inclusive sites (Discover Ability for example) to ensure significant exposure.

The next time you need to recruit within your organization, take the time to speak with your HR recruiter and find out what the diversity insights were from the posting, such as how many candidates self-identified as male, female, or even have self-identified as having a disability. It is amazing what you can learn from the applicant pool. This information can help you gauge if you need to be socializing and promoting your organization or roles in other ways.

We are seeing more women in front line roles being treated respectfully on a job site, and more women in leadership roles which is important to promote career growth.

Retention – Retention is something that we continue to struggle with in the work force, gone are the days of someone dedicating their life to one or two workplaces. We see over 50% of working women being primary caregivers at home to either children or aging parents. There is pressure to do it all; perform at work, work harder, and many times do more to achieve career milestones, while providing care at home once leaving work.

Schedule flexibility can be a leading factor to retention. Having flexibility on days in the office or home for appointments, illness, early sport games, and home demands can outweigh a promotion for some.

In the past 10 years, there has been a 66% increase in females on construction sites. The Ontario government has introduced an initiative to clean up on site washrooms to be sanitary. A clean, safe washroom is important to everyone and thankfully with more women in the workforce this is being addressed. Various provinces also have legislated requirements of washrooms on construction sites have running water for hand washing.

Asking people why they are staying and what is important to them could help in your employee retention. What you will hear is that most people are not staying for money, it is the people, the flexibility, and the sense of contributing to their community.

Advancement –You can't be what you can't see. When looking at employers, female workers want to see what a potential career ladder/progression looks like for them. Where do they see themselves in the future, do they see female or minority leaders now and can they aspire to that, will there be growth opportunity? Having and celebrating diversity throughout the organization ensures it is seen versus just having females in certain roles. For many women the challenge is to speak up and voice their opinions within a male dominated industry. We need to ensure women are given a voice.

Training also plays a key role for all staff. What training is available? What opportunities are given to build leadership or new skills? Is the training being spread equally amongst all staff? Mentoring is important whether it is, peer to peer, new employee to someone more senior, or new leader to seasoned leader. Providing support allows women to open up about issues and work through different scenarios by sharing similar experiences and perspectives, and being more comfortable to have these discussions with others versus a supervisor to navigate various challenges.

As employers we need to look at our workforce and champion for change. You can be vocal about it, be visible and speak up or you can be a person who works quietly behind the scenes, asking questions to diversity teams, reading up on women in the workforce, looking at policy changes and looking how we can attract women into the great world of utilities.

EXCAVATOR OF THE YEAR Awards 2024

ORCGA recognizes excavators with the Best In-Class safe digging practices.

Congratulations to our 2024 Excavator of the Year recipients!

Each year, the Ontario Regional Common Ground Alliance (ORCGA) proudly recognizes excavators with the Best In-Class safe digging practices and congratulates the winners by presenting them with the Excavator of the Year awards.

The Excavator of the Year winners are determined by reviewing each excavator's individual damage rate for the previous year. A damage rate is a calculation based on the excavator's volume of locate requests, measured against their number of digging related damages to underground infrastructure. Input from infrastructure owners is also used to determine the winners, along with risk level within a given work type when other factors are similar. To qualify, excavators must have submitted a minimum of 500 locate requests to Ontario One Call within the calendar year.

Excavators are divided into ten categories: Electric, Gas, Homebuilder, Landscape, Roadbuilder, Sewer/Water, Telecommunications, Most Improved, Hydrovac Excavation, and new for this year, Honourable Recognition.

Continuing our commitment towards industry improvement, the ORCGA Reporting & Evaluating Committee has added an Honourable Recognition Award for 2024. This is an opportunity to recognize an excavator that did not meet the criteria of 500+ locate requests, however, has shown their commitment to safety and excavation best practices. Excavators who submitted 250-499 locate requests to Ontario One Call within the calendar year are eligible to be considered for the Honourable Recognition Award.

ELECTRIC	GAS	HOMEBUILDER
EC POWER & LIGHTING LTD.	T. W. JOHNSTONE CO. LTD. CONTRACTORS LONDON-ONTARIO	techno Metal Post

LANDSCAPE	ROAD BUILDER	SEWER/WATER
GRAY'S Landscaping & Snow Removal	SUNRISE CONTRACTING INC.	FER-PAL INFRASTRUCTURE

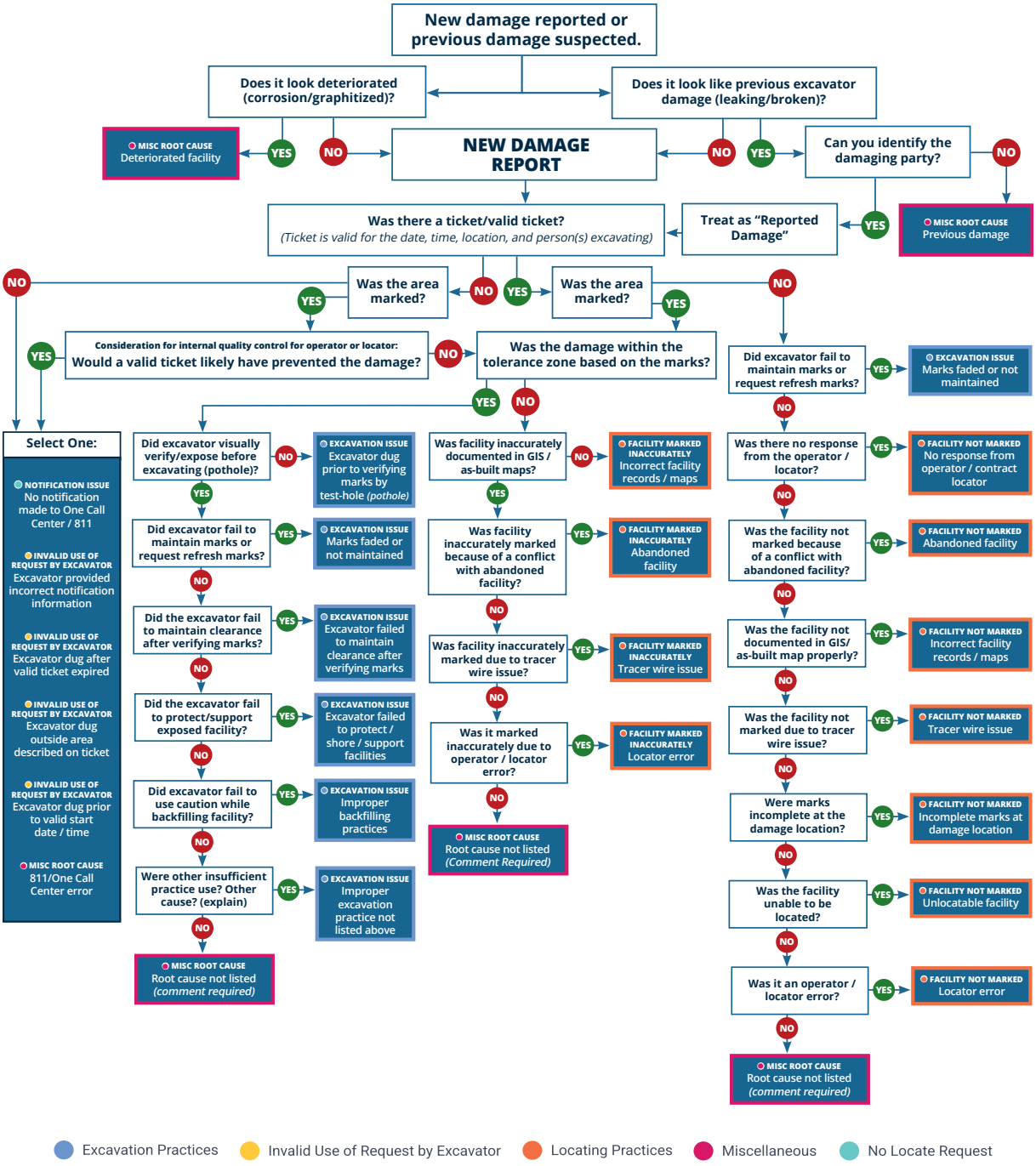
TELECOMMUNICATIONS	HYDROVAC	MOST IMPROVED	HONOURABLE RECOGNITION
CABLECAN CORP.	OE UTILITY SERVICES GET MORE OUT	Robert Excavating	

Appendix A: Root Cause Determination Flow Chart

DIRT Damage Information Reporting Tool

DAMAGE INFORMATION REPORTING TOOL
ROOT CAUSE DETERMINATION FLOW CHART

Root Cause: The predominant reason that the event occurred. (Best Practices) For purposes of the DIRT, the point where a change in behavior would reasonably be expected to lead to a change in the outcome, i.e. avoidance of the event. *For definitions and further explanation, please see Part I of the DIRT Users Guide.*



CGA Common Ground Alliance

Appendix B: Damage Information Reporting Tool (DIRT) - Field Form

FRESH DIRT (beginning 2018)

Rev: 6/20/2024

'*' 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 Emergency Services ☐ 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 Measured depth
☐ 18" – 36" / 46 - 91 cm ☐ >36" / 91 cm 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

Part E – Notification and Locating

☐ Unknown/Other

***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

Appendix B: Damage Information Reporting Tool (DIRT) - Field Form

FRESH DIRT (beginning 2018)

Rev: 4/3/2018
'*' 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

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

Locating Issue
Facility not marked due to:
☐ Abandoned facility
☐ Incorrect facility records/maps
☐ Locator error
☐ No response from operator/contract locator
☐ Incomplete marks at damage location
☐Tracer wire issue
☐ Unlocatable Facility

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

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 & Definitions

Abandoned: With reference to underground infrastructure, taken out of service permanently but left in place.

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.

Damage Reporting: The immediate reporting to appropriate authorities and the owner of any damage made or discovered in the course of excavation or demolition work.

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.

Depth: The vertical distance below grade.

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.

Hand Digging: Any movement of earth using a hand shovel*. The preference is to use an insulated or wooden-handled shovel.

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

Appendix C: Glossary of Terms & Definitions

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

Locate (verb): The process of an underground plant owner 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 owner or their agent (usually the notification service) in which a request for locating underground facilities is processed.

Locate Ticket: A locate request document created by the notification service or an owner marked with a unique identification number.

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

LSP: Locate Service Provider - a person authorized by the owner to locate and mark its underground facilities.

Marks or Markings: Surface marking indicating the presence of underground infrastructure including but not limited to highly visible paint and/or labeled stakes or flags to indicate the approximate location of buried facilities within the Located area.

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 owner

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

Tolerance Zone: The space in which a 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: A private, publicly, or cooperatively owned entity whose purpose is to deliver a commodity or service such as communications, television/internet, power, electricity, light, heat, gas, oil, water, steam, and waste collection.

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.

** This does not include picks, bars, stakes, or other earth-piercing devices.*

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