

CGA DIRT Analysis & Recommendations Volume IV

DIRT

Damage
Information
Reporting
Tool



2007

This report may be referenced as the Common Ground Alliance analysis on 2004-2007 data submitted to DIRT.

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Released December, 2008

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Dear Stakeholders:

The fourth Annual Report analyzing data submitted to the Damage Information Reporting Tool (DIRT) provides a comprehensive look at the progress being made in underground damage prevention efforts. These reports are a production of the Common Ground Alliance (CGA)'s continuing mission to identify the contributing factors and root causes of facility events (or underground damages and near misses) and reinforce the direction to effectively reduce the number of events occurring each year. The data used for this report was submitted by CGA stakeholders and represents events occurring in 2007.

As in each previous year since DIRT's inception in 2004, the use of DIRT and the number of events submitted continues to increase. For 2007 more than 150 organizations submitted 121,384 records, representing a 16% increase over the prior year. While this is still a significant increase in records submitted, the CGA encourages ALL stakeholders to collect and submit their qualified underground damage and near miss information into DIRT so that it can be included in the analysis of data submitted throughout the US and Canada.

Perhaps the most significant item in the Report is the determination that approximately 256,000 damages occurred in the United States in 2007; a paramount reduction over previous years. Several factors likely led to a lower estimate including stakeholder support and promotion of 811, Regional CGA efforts and implementation of CGA Best Practices by stakeholders as well as the use of new and proven technologies. The Data Committee used newly-available information to refine its current estimate, which also indicates that its original estimate for 2004 may have been overstated. Even so, the data does indicate a significant reduction in damages over the three-year period. This reduction is supported by several different sources with similar downward trends including the recognition of a slowing economy.

Growth is also evident by the number of Virtual Private DIRT (VPD) accounts being requested and developed. Currently, there are 21 active VPD accounts in use with several pending requests under development. VPD is an efficient, secure and useful solution for managing one's damage and near miss data which can be customized to fit the needs of the individual organization or company. VPD's are currently being used by trade associations, one-call centers and individual companies who understand the importance of collecting and sharing damage and near miss information for analysis. Understanding the root cause of these events will hopefully prevent future events from occurring which can save lives and money.

As with all new processes, with growth come challenges. In response to recommendations made in last year's Report concerning a growing number of records submitted without important information, the CGA has implemented the Data Quality Index (DQI). The DQI is a 'measure of completeness' for each record submitted. Only with complete data can meaningful analysis be performed. The overall DQI for the 2007 event data is 50%, which establishes a benchmark that can be improved upon. Once again all stakeholders are strongly encouraged to align their individual damage and near miss data collection processes to DIRT so that data submitted yields relevant conclusions. The CGA has provided tools to accomplish this with its Field Form and User's Guide, and committee members are available to assist other stakeholders in this regard. Going forward, the CGA as well as each individual stakeholder, can measure the progress or improvements in reporting utilizing their individual DQI.

This year's Report indicates that the percentage of events with the identified "Root Cause of Notification Not Made" continues to decline with "Excavation and Locate Practices Not Sufficient" both on a steady increase. Implementation of 811, and the awareness campaign spurred by it, in part contributed to this continuing shift in root causes. A similar awareness campaign is underway for the DIRT project now.

Thank you for your participation and I encourage you to strive to submit more and complete data.

Sincerely,

Robert R. Kipp
President, Common Ground Alliance

Introduction

The 2007 DIRT Report (2007 Report) represents the ongoing initiative by the Common Ground Alliance (CGA) to respond to the Common Ground Study of 1998. The Common Ground Study, sponsored by the United States Department of Transportation, identified a set of Best Practices that are most effective in protecting the public, excavators, and the environment by preventing damages to underground facilities. This study produced and documented a collection of best practices in one call and damage prevention programs, and was the catalyst for the development of Damage Information Reporting Tool (DIRT) and subsequent DIRT Report. The DIRT reporting process is the starting point for assessing the damage prevention efforts pursued by the CGA.

The 2007 Report represents the efforts and information provided by underground utility stakeholders who submitted 121,334 facility events for 2007; a 16% increase over facility events submitted in 2006. Facility events (or events) are defined by the CGA DIRT User's Guide as "the occurrence of downtime, damages, and near misses." Facility event information helps CGA identify factors that contribute to facility events, perform trend analysis, and provide insight to all stakeholders by means of the DIRT Report.

The 2004 and 2005 Reports analyzed and discussed each field of the *DIRT Field Form*. As directed by the DR&EC (Damage Reporting and Evaluation Committee), the 2006 Report concentrated on, and limited discussion to, specific data elements (fields) and their characteristics. The 2006 Report also included analyses of combinations of data elements. The 2007 Report continues the practice. The DR&EC also initiated an effort to define metrics that have potential for estimating future facility events within the United States. These items are discussed within the following sections. Each section heading, where applicable, is followed by parentheses indicating which section of the *DIRT Field Form* it corresponds to (i.e. Part A, B, C, etc).

It is important to note that conclusions cannot be made by comparing percentages based on the number of events in the charts. The reason is that different organizations may submit their records one year and not another, e.g. 132 organizations submitted data in 2006, while 157 organizations submitted data in 2007. Of these, 91 organizations submitted data both years. Also, there are organizations that have not submitted data into DIRT. Therefore, a stakeholder group may be more or less represented from one year to the next relative to other stakeholder groups.

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. The analysis of said data may not be representative of what is actually occurring in any particular geographic area(s) or for any particular industry group(s). Please use caution when drawing conclusions based upon the data or the Report.

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Discussion of Important Data Elements

This 2007 Report follows the methodology established in the 2006 Report in that the DR&EC chose to limit the analyses to certain individual data elements that address an aspect of damage prevention. However, the analysis of an individual data element may not always illustrate the complete picture, regardless of how many events are submitted during the year. The analysis of multiple data elements in combination continues to offer a clearer picture of the issues and problems related to facility damage and may lead to promising solutions.

The individual data element analyses are based on data from the 2004 through 2007 DIRT data sets. The years and number of events analyzed that year are included within the chart legend. The charts also include the percentage of events per specific data element classification. The 2007 data analysis was performed utilizing the total number of events with useful information for the specific data element. The additional events are represented as the unknown share percentage. The number of events analyzed and the corresponding number of total events submitted are identified (i.e. (89%) 108,025 Known Facility Operation Affected Events). The largest share of known events for the data elements may be identified by the number of events analyzed and their corresponding percentage (i.e. Region 6 South West (31%) 38,101 events). Additional observations may be included.

Charts and tables for each data element within the DIRT data set, including those that were not presented within the 2007 DIRT Report, can be viewed online at <http://cga-dirt.com/annual>.

A summary table of the statistics presented can be found on the last page of this Report.

If you have any questions in regards to the data or analysis within this Report, or would like to post a question, or comment on the Report, please email the DIRT Reporting Task Team at: dirt-report@damagereporting.org

Missing Data in Event Reports

Each submitted record contains numerous data elements that are vital to understanding and interpreting the incidents reported in DIRT. The majority of the submitted events for the 2007 Report were missing one or more data elements. The majority of the missing information was reported as “Unknown/Other” or “Data Not Collected” for specific data elements. The 2007 Report is consistent with the procedure established within the 2006 Report of narrowing the analysis of the events by utilizing only those events that have complete data element entries for that particular field. The events that are incomplete are illustrated to the left of the main chart as a separate chart and identified as “DNC, Unknown, Other.” The occurrence of missing data elements led to the development of the Data Quality Index (DQI). The DQI provides a quantitative benchmark for individual stakeholders to review the quality of the facility events that they submit on an ongoing basis. Please see DQI section later in this report.

Facility Events – Multiple Reports Submitted for the Same Event

The DR&EC has long recognized that multiple reports may exist for a single event, and that the submitting stakeholder may not necessarily be the affected facility owner. For example, reports may be submitted by locators, excavators, regulators, right-of-way providers, etc. The statistical analysis of the 2007 data showed less than 2% of the facility events reported might be referring to the same event.

CGA Best Practice 9-1 states: “Facility owners/operators, locators, excavators, or stakeholders with an interest in underground damage prevention report qualified information on incidents that could have, or did, lead to a damaged underground facility.”

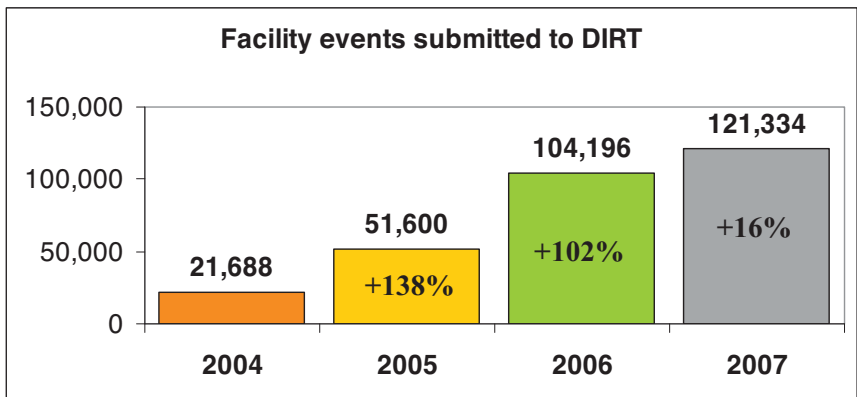
In the case of multiple reports, there may be useful data on one submission but omitted on another due to different data collection practices or even differences in point of view of the actual disposition of the event. This information helps the CGA identify factors that contribute to facility events, perform trend analysis, and educate all stakeholders so that damages can be reduced through effective practices and procedures. In addition, more complete reporting allows the

DR&EC to better identify instances of multiple reports of the same event. For example, the city and street address are not required fields. If two or more reports from different stakeholders are otherwise similar but these two fields are not completed, the DR&EC cannot determine if they refer to the same event or different events on the same date in the same county. For these reasons, it is important that all stakeholders align their event data collection and reporting process to the DIRT specifications and submit data to the DIRT system that is as complete as possible.

Data Element Analysis

1. Facility events submitted by year

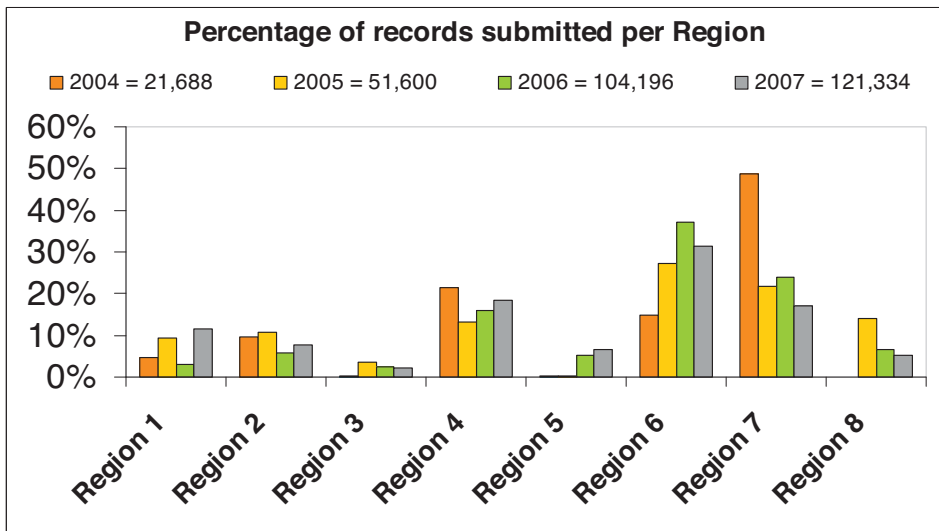
The events submitted to DIRT continued to increase for the third (2005, 2006, 2007) consecutive year. The percentage increase during the year 2007 is significantly smaller than previous years (2005, 2006) as shown in the graph.



2. Facility events within OCSI Region

Events were submitted and recorded within all eight Regions in 2007. [Please refer to the OCSI Regions Map on pg. 5] The three Regions with the largest number of event submittals remain the following:

- Region 6 South West (32%) 38,101 events
- Region 4 Great Lakes (18%) 22,258 events
- Region 7 North West (17%) 20,642 events

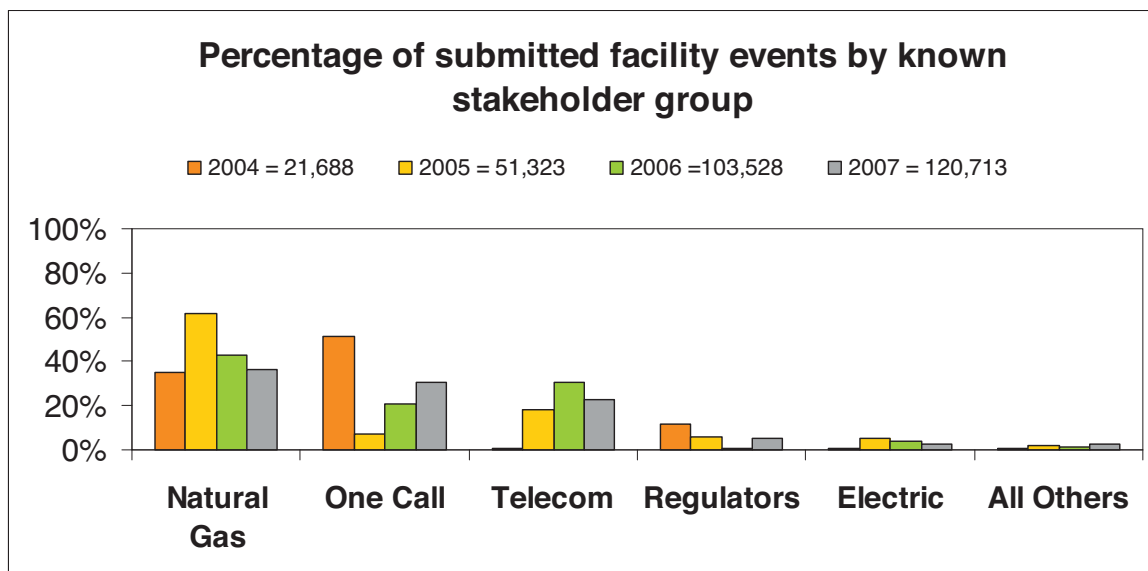


Facility event information was submitted to DIRT and compiled for eight different Regions as illustrated on the map below. These Regions were defined by One Call Systems International (OCSI).



3. Submitted facility events by known stakeholder (Part A)

Within this Report the natural gas, one call and telecommunications stakeholders were identified as the stakeholders submitting the majority of facility events. The natural gas stakeholders submitted 36% of the facility event reports, and as shown under the next data element discussed on the following page, is also the leading type of facility operation affected. Some reporting stakeholders, such as one call centers, regulators, excavators, and locators do not operate underground facilities. In past years' reports the DR&EC made the assumption that events submitted by one call centers were a "pass-through" of information received by their member facility operators, and redistributed them by attributing them to the affected facility operation. For the 2007 Report, the DR&EC has elected to instead identify events submitted by one call centers as such. The DR&EC encourages all stakeholders, whether or not they are also affected facility operators, to submit facility events in response to near misses or damaged facilities.

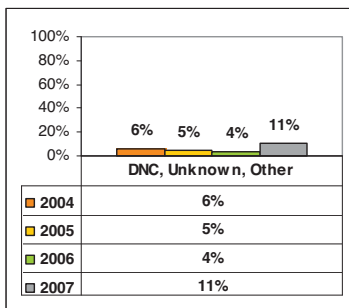
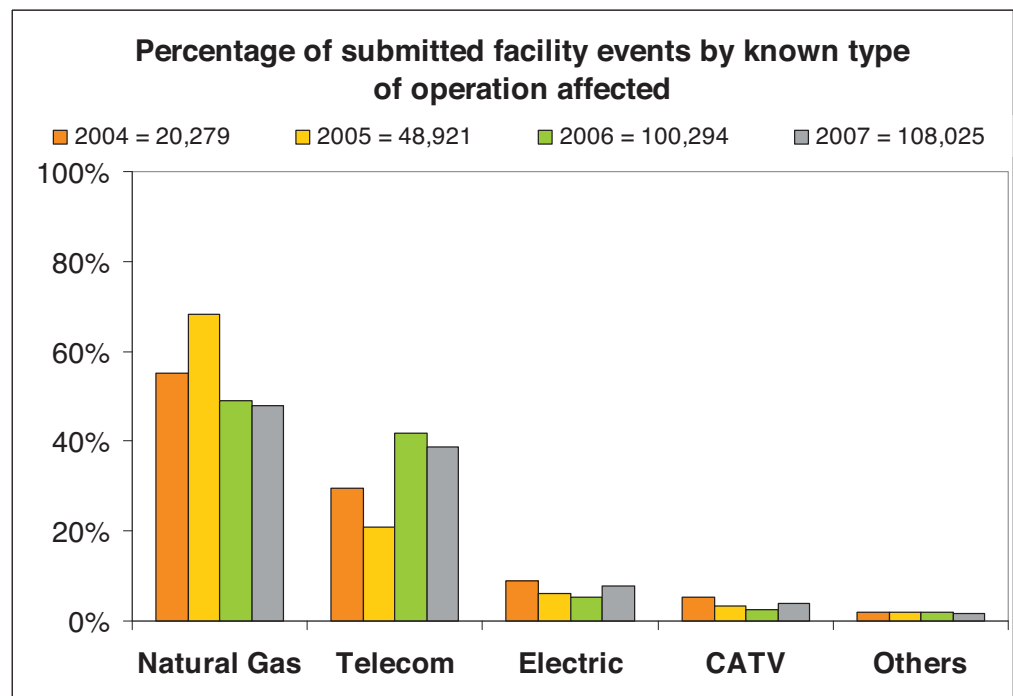


4. Submitted facility events by known type of facility operation affected (Part C)

Telecommunication and natural gas facilities continue to be affected in the majority of events entered in DIRT (approximately 90% in both 2006 and 2007)-

(89%) 108,025 Known Facility Operation Affected Events

-Natural Gas	(48%) 51,905 events
-Telecommunication	(38%) 41,771 events
-Electric	(8%) 8,470 events
-Cable TV	(4%) 4,066 events
-Others	(2%) 1,813 events
	108,025 events



*11% of events did not identify type of operation affected.

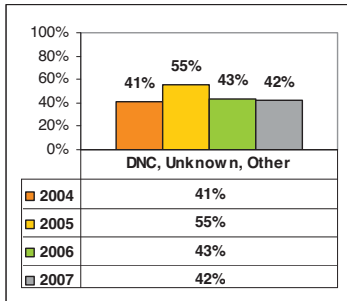
5. Frequency of events by known excavation equipment group (Part D)

The findings of this graph are nearly identical to those from 2004-2006. Backhoes, trackhoes and trenchers were involved in the largest number of events reported, accounting for 70% of the events in 2007.

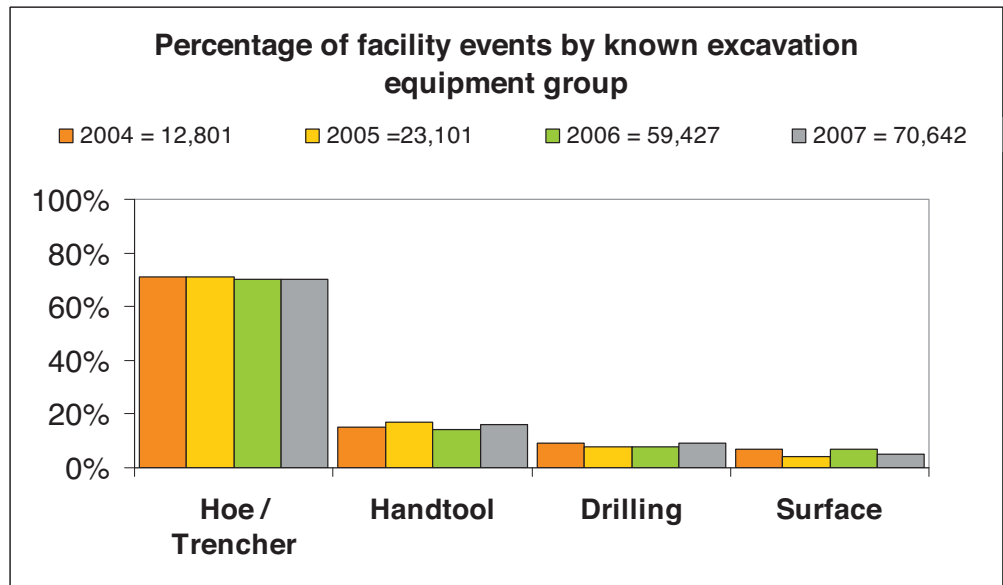
Group	Excavation Equipment Type
Hoe / Trencher	Backhoe, Trackhoe, Trencher
Handtool	Handtool, Probe
Drilling	Auger, Bore, Directional Drill, Drill
Surface	Grader, Scraper, Road Milling Equipment
Other	Explosives, Vacuum Equipment, Farm Implement

(58%) 70,642 Known Excavation Equipment Group Events

-Hoe / Trencher	(70%) 49,333 events
-Handtool	(16%) 11,183 events
-Drilling	(9%) 6,530 events
-Surface	(5%) 3,489 events
-Other	(<1%) 107 events
	70,642 events



***42% of events did not identify type of excavation equipment.**



6. Facility events reported by known root cause group (Part I)

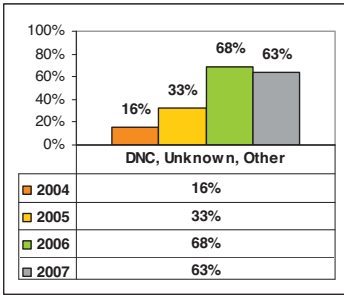
It is interesting to note that “Locating Practices Not Sufficient” and “Notification Practices Not Sufficient” are listed as the primary root cause in a steadily increasing percentage of facility events, while the share of events with a root cause of “Notification NOT Made” continued to decline. The kickoff for 811, the national call-before-you-dig number, took place in May of last year and may have had an impact on this element.

“Excavation Practices Not Sufficient” remains a significant root cause of facility events reported, regardless of the notification being made prior to the facility event occurrence.

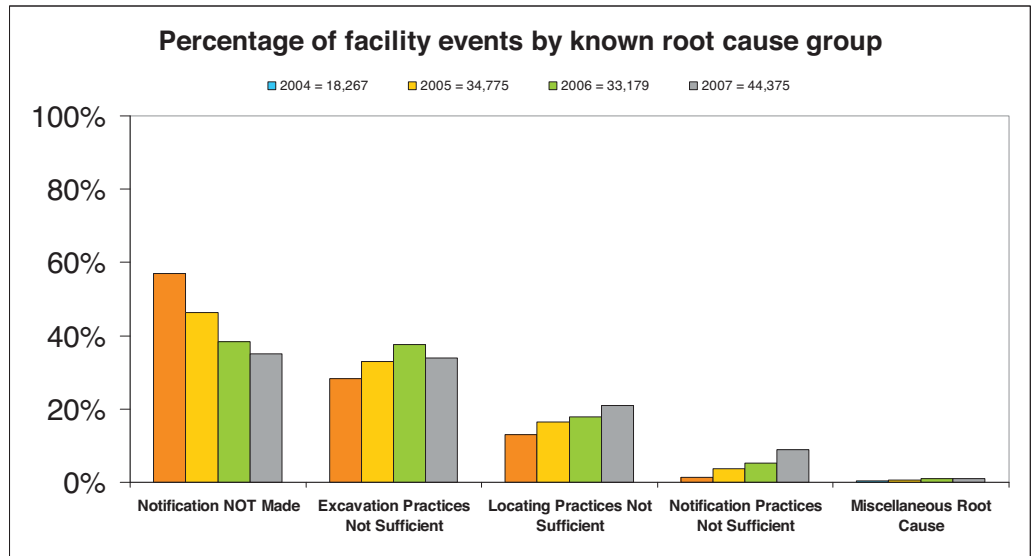
Group	Root Cause Type
Notification NOT Made	No notification made to the one call center
Excavation Practices Not Sufficient	Failure to maintain clearance, Failure to support exposed facilities, Failure to use handtools where required, Failure to test-hole(pot-hole), Improper backfill practices, Failure to maintain marks, Excavation practices not sufficient (other)
Locating Practices Not Sufficient	Incorrect facility records/maps, Facility marking or location not sufficient, Facility was not located or marked, Facility could not be found or located
Notification Practices Not Sufficient	Notification to one call center made but not sufficient, Wrong information provided to one call center
Miscellaneous Root Cause	Abandoned, One call center error, Deteriorated, Previous Damage

(37%) 44,375 Known Root Cause Type Events

-Notification NOT Made	(35%) 15,416 events
-Excavation Practices Not Sufficient	(34%) 14,996 events
-Location Practices Not Sufficient	(21%) 9,426 events
-Notification Practices Not Sufficient	(9%) 4,013 events
-Miscellaneous Root Cause	<u>(1%) 524 events</u>
	44,375 events



***63% of events did not identify root cause of the facility event.**



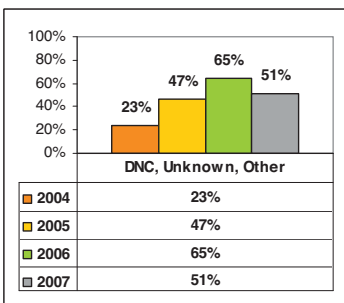
7. Frequency of events by known excavator group (Part D)

This data is very similar to the data collected in years 2004-2006. Contractors and developers are involved in a significant portion of the reported facility events. Additional analysis is provided within the multiple field analysis portion of this Report.

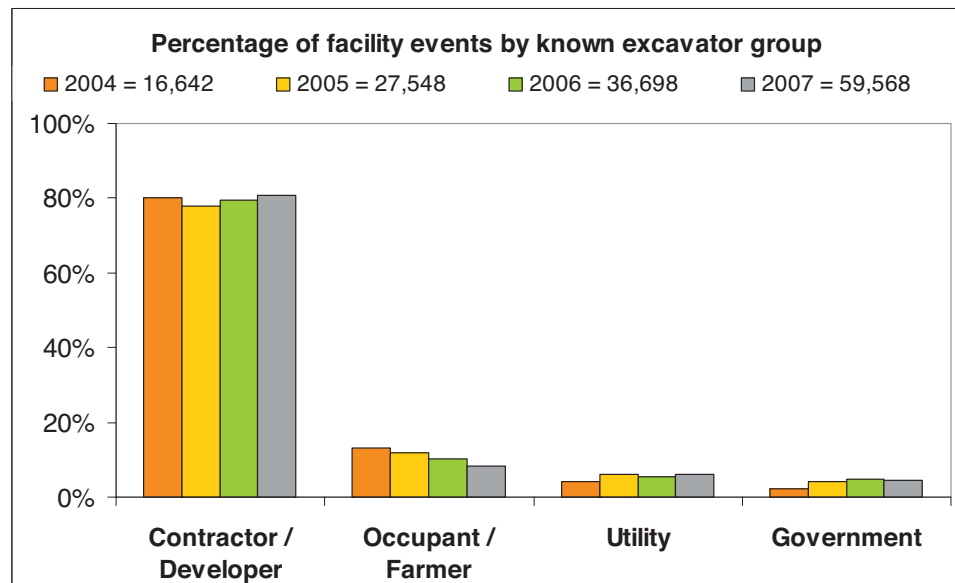
Group	Excavator Type
Contractor / Developer	Contractor, Developer
Occupant / Farmer	Occupant, Farmer
Utility	Utility
Government	State, County, Municipality

(49%) 59,568 Known Excavator Group Events

Contractor / Developer	(81%) 48,133 events
Occupant / Farmer	(8%) 5,015 events
Utility	(6%) 3,713 events
Government	(5%) 2,695 events
	<u>59,568 events</u>



***51% of events did not identify type of excavator group.**



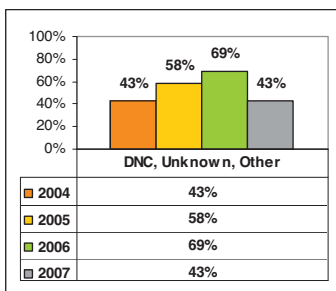
8. Facility events by known type of work performed group (Part D)

Events citing utility work (Sewer, Water, Energy, and Telecommunications) accounted for 55% of all submissions. The number of facility events associated with these types of work has been consistent ranging from 50-57% since 2004.

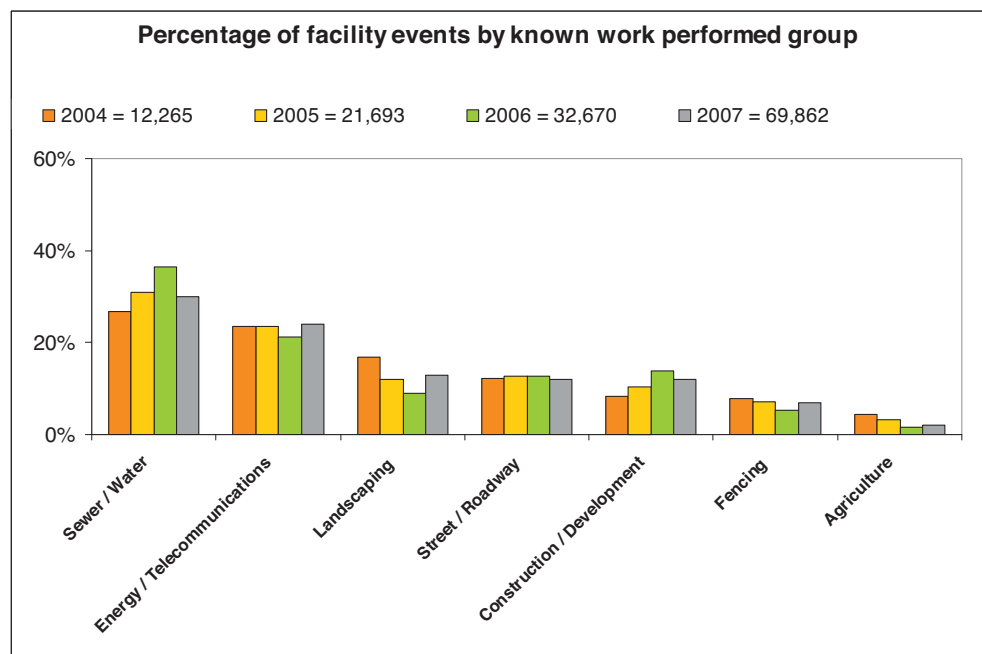
Group	Type of Work Performed
Sewer / Water	Sewer, Water
Energy / Telecommunications	Natural Gas, Electric, Steam, Liquid Pipe, Telecom, Cable TV
Landscaping	Landscaping
Street / Roadway	Roadwork, Curb/ Sidewalk, Storm Drainage, Milling, Pole, Traffic Signals, Traffic Signs, Streetlight, Public Transit
Construction / Development	Construction, Site Development, Grading, Drainage, Driveway, Demolition, Engineering, Railroad, Waterway
Fencing	Fencing
Agriculture	Agriculture, Irrigation

(57%) 69,862 Known Work Performed Type Events

Sewer / Water	(31%) 21,454 events
Energy / Telecommunications	(24%) 16,861 events
Landscaping	(13%) 9,117 events
Street / Roadway	(12%) 8,445 events
Construction / Development	(11%) 8,097 events
Fencing	(7%) 4,652 events
Agriculture	(2%) 1,236 events
	<u>69,862 events</u>



***43% of events did not identify type of work performed.**



Multi-Field Analysis

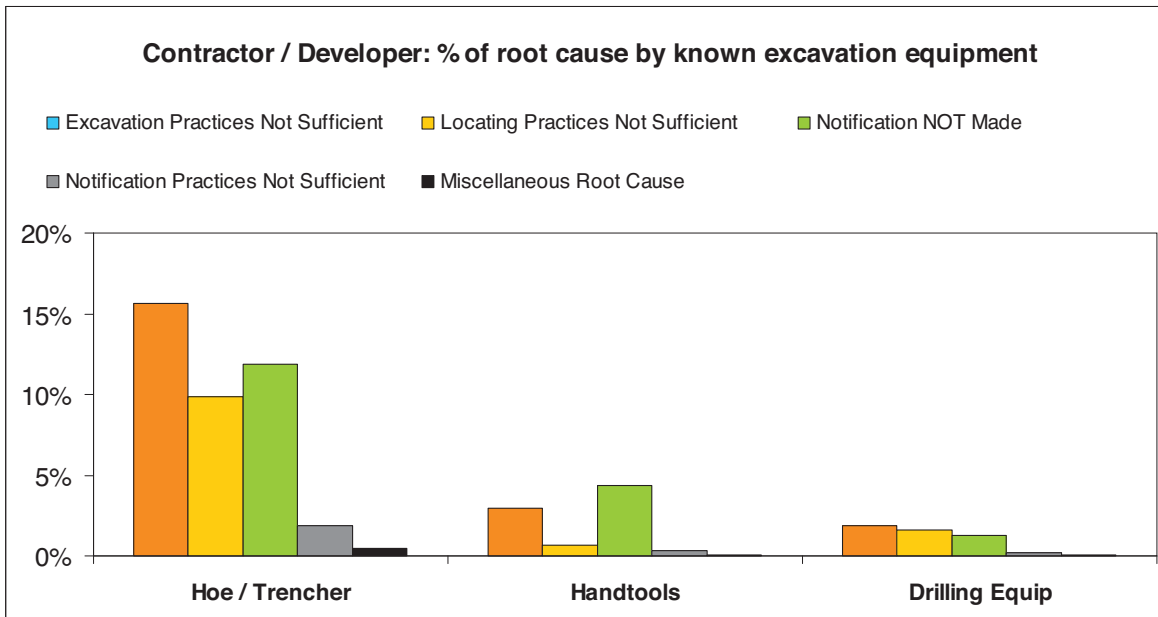
1. Analysis of excavation equipment group and root cause group for two excavator groupings

2007 Contractor / Developer- (75%Known Data) 36,241 of 48,133 events*

Facility Events Submitted	48,133
Share of Total Events	39%

Events with Root Cause and Type of Excavation Equipment Reported	36,241
Share of Facility Events Submitted with Known Data	75%

The following chart illustrates the root causes of events for two groupings of (1) Contractor / Developer and (2) the combined Occupant / Farmer and Utility excavator types based upon which excavation equipment was used during the event. The Contractor / Developer excavator group below shows “Excavation Practices Not Sufficient” as a major root cause for the facility events being reported, particularly when Hoe / Trencher is the excavation equipment reported.



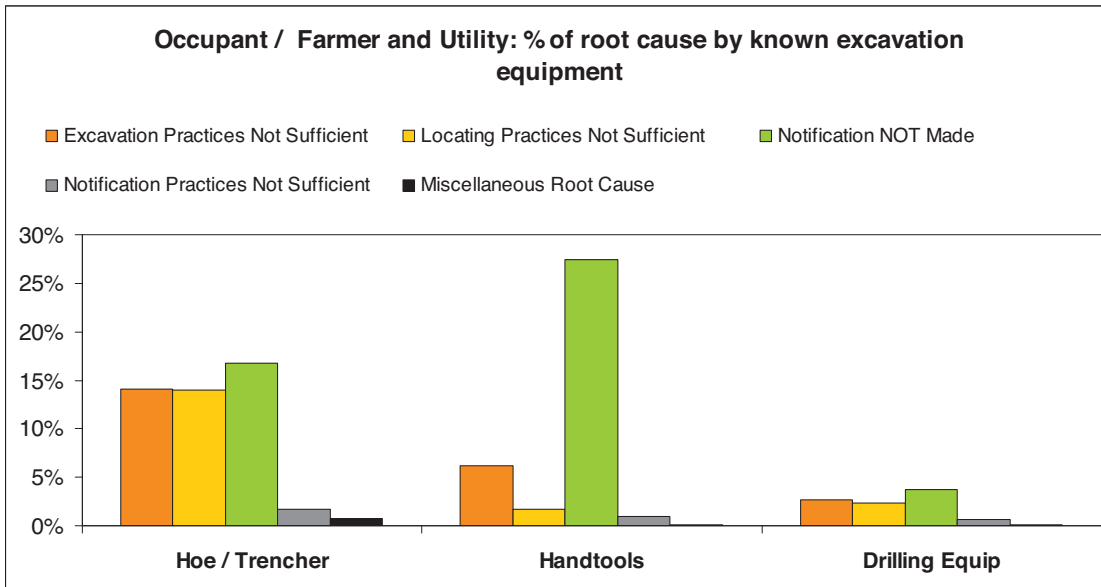
*48, 133 events were in the Contractor / Developer excavator group.
36, 241 of these had a known excavation equipment type AND a known root cause for the facility event.

2007 Occupant / Farmer and Utility- (66% Known Data) 5,798 of 8,728 events*

Facility Events Submitted	8,728
Share of Total Events	7%

Events with Root Cause and Type of Excavation Equipment Reported	5,798
Share of Facility Events Submitted with Known Data	66%

The Occupant/ Farmer, and Utility groupings were combined because separately, their respective graphs were nearly identical. The root cause distribution for these two groups was significantly different from those of the Contractor / Developer group. The majority of the facility events that involved Occupant / Farmer, or Utility excavation groups listed a root cause of “Notification NOT Made.” Some state regulations do not require one call center notification for excavation with hand tools. In addition, regulations in some states and provinces do not apply to certain types of excavators.

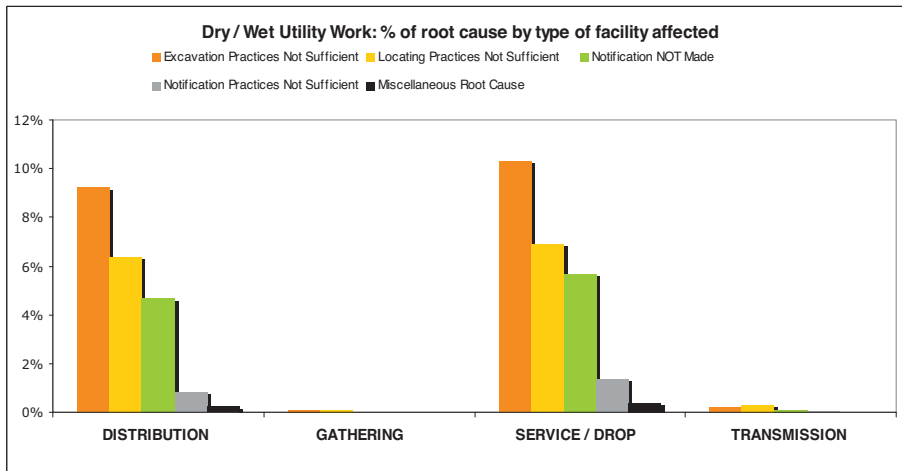


***8,728 events were in the Occupant / Farmer and Utility excavator group.
5,798 of these had a known excavation equipment type AND a known root cause for the facility event.**

2. Analysis of root cause and facilities affected type for five types of work groupings

The following charts illustrate the root causes of events for two groupings of Dry / Wet utility and Roadwork types based upon the type of facility affected during the event. The Dry / Wet utility and Roadwork types have “Excavation Practices Not Sufficient” as the primary root cause for Distribution and Service / Drop facilities, with “Locating Practices Not Sufficient” and “Notification NOT Made” root causes significantly lower.

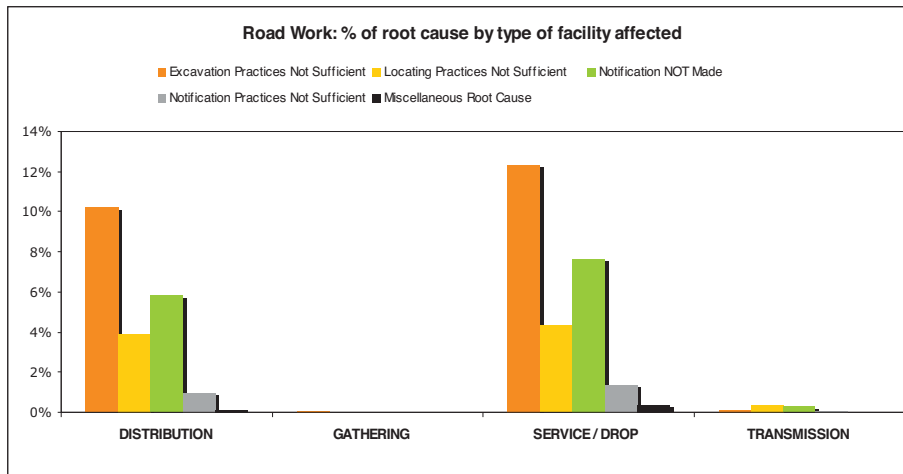
Group	Type of Work
Dry / Wet Utility	Sewer, Water, Natural Gas, Electric, Steam, Liquid Pipe
Roadwork	Roadwork, Curb / Sidewalk, Storm Drainage, Milling, Pole, Traffic Signals, Streetlight, Public Transit
Agricultural	Agriculture, Irrigation
Construction	Construction, Site Development, Grading, Drainage, Driveway, Demolition, Engineering, Railroad, Waterway
Fencing / Landscaping	Fencing, Landscaping



Facility Events Submitted	38,315
Share of Total Events	32%

Events with Root Cause and Affected Facility Type	19,154
Share of Facility Events Submitted with Known Data	50%

*Excavation Practices Not Sufficient is the major root cause for Distribution and Service / Drop facilities ranging from 9-11%

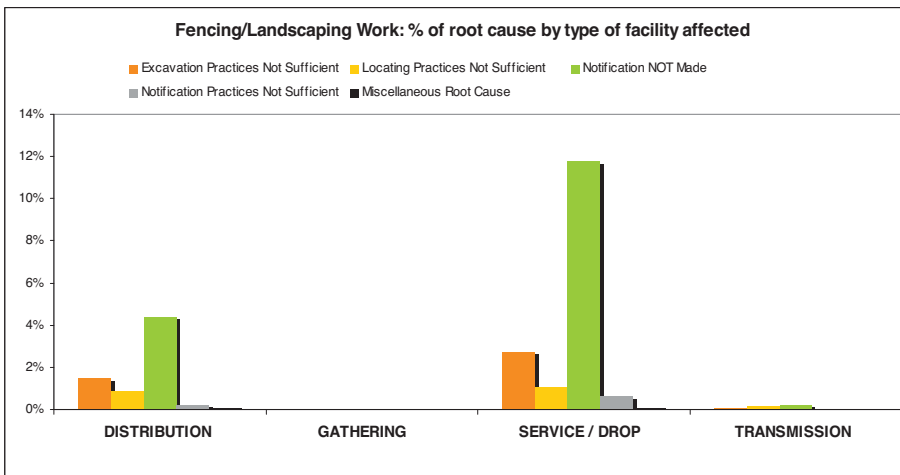


Facility Events Submitted	8,445
Share of Total Events	7%

Events with Root Cause and Affected Facility Type	868
Share of Facility Events Submitted with Known Data	70%

*Excavation Practices Not Sufficient is the major root cause for Distribution and Service / Drop facilities ranging from 10-13%

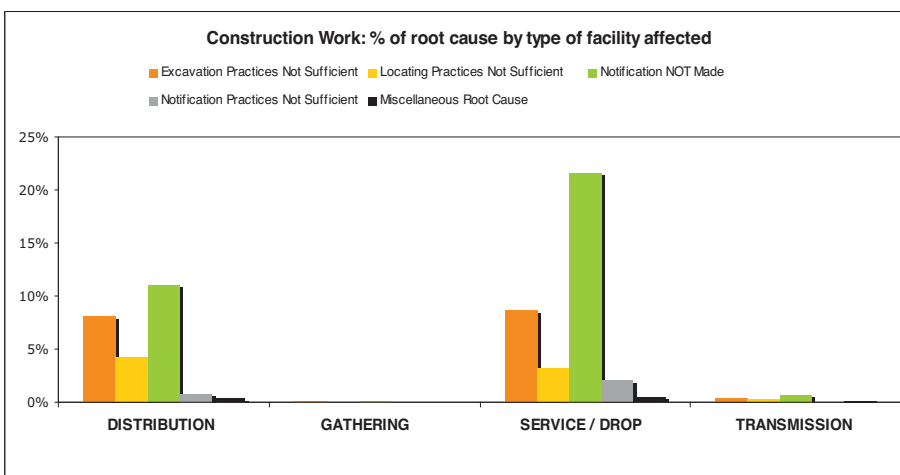
The following charts illustrate the root causes of events for three groupings of Agricultural, Construction, and Fencing / Landscaping work types based upon the type of facility affected during the event. The root cause distribution for these groups is significantly different from that of the Dry / Wet utility and Roadwork types. These work types list “Notification NOT Made” as the major root cause, particularly for events involving Service / Drop facilities. When “Locating Practice Not Sufficient” is listed as the root cause, this may be a result of the utility owner not being required to locate their Service / Drop connections. As an issue that affects many stakeholder groups, the CGA has, and will continue to, take an interest in developing appropriate solutions in this area. This is a topic under ongoing review by the Best Practices Committee.



Facility Events Submitted	18,421
Share of Total Events	15%

Events with Root Cause and Affected Facility Type	9,389
Share of Facility Events Submitted with Known Data	51%

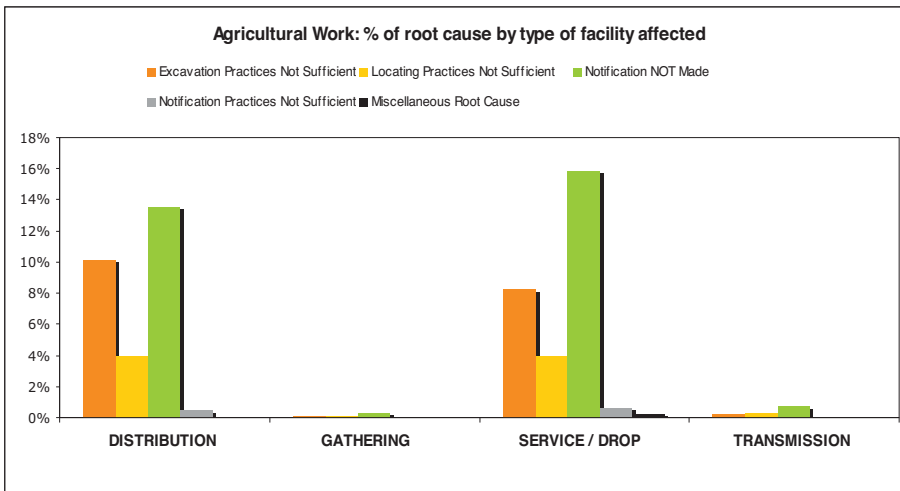
*Notification NOT Made is the major root cause for Distribution and Service / Drop facilities ranging from 5-12%



Facility Events Submitted	8,097
Share of Total Events	7%

Events with Root Cause and Affected Facility Type	5,220
Share of Facility Events Submitted with Known Data	64%

*Notification NOT Made is the major root cause for Distribution and Service / Drop facilities ranging from 12-22%



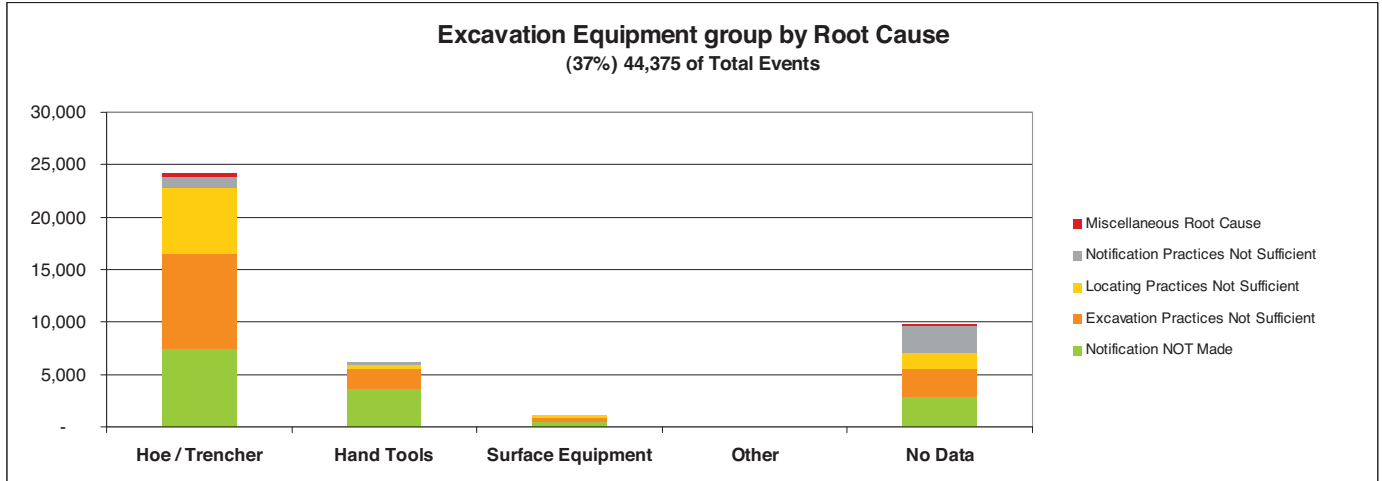
Facility Events Submitted	1,236
Share of Total Events	1%

Events with Root Cause and Type of Excavator Reported	868
Share of Facility Events Submitted with Known Data	70%

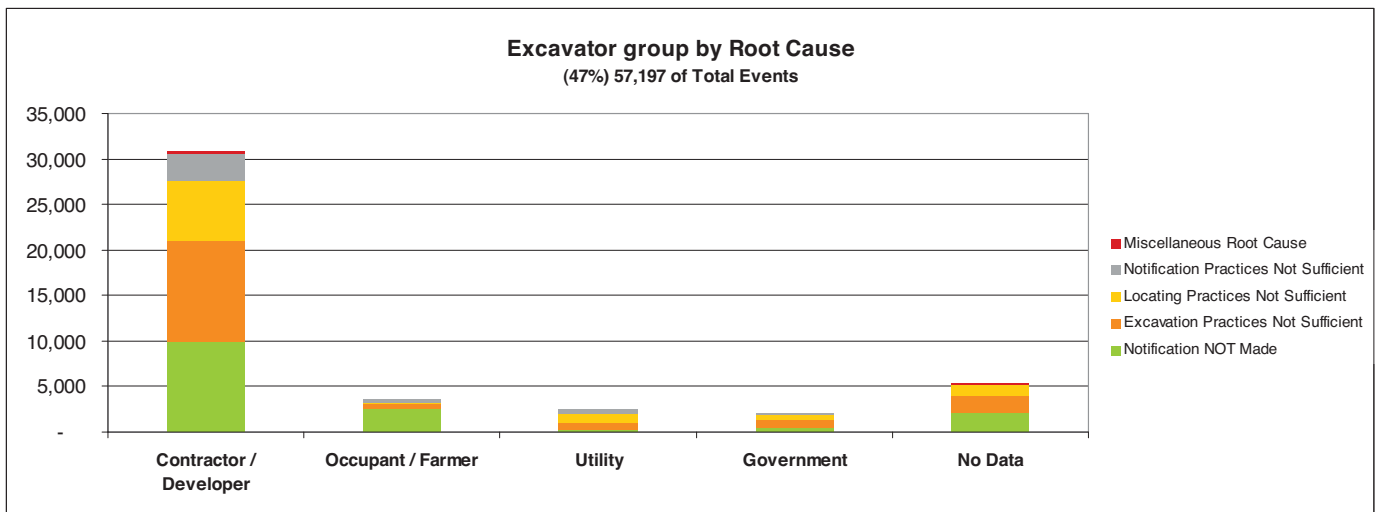
*Notification NOT Made is the major root cause for Distribution and Service / Drop facilities ranging from 13-16%

3. Excavation Equipment and Excavator Type by Root Cause - Summaries

The review of data elements presented earlier suggests that professional excavators performing construction and development work with backhoes continue to be involved with a significant share of the facility events and the primary root cause reported for these events was “Excavation Practices Not Sufficient.” However, as indicated by the Multi-Field Analysis, differences start to emerge when examining these root causes in combination with the type of excavation equipment utilized and the type of excavation being performed. Reported facility events involving Occupant / Farmer and Utility excavators indicated that “Notification NOT Made” was the primary root cause. The following charts illustrate these relationships.



*In this case, *No Data* refers to the excavation equipment type. The events listed here have a root cause included in the data reported to DIRT, but no excavation equipment type was specified.



*In this case, *No Data* refers to the excavator group. The events listed here have a root cause included in the data reported to DIRT, but no excavator group was specified.

Report Findings Summary

One purpose of this Report is to identify existing circumstances that cause facility damages so that solutions can be developed to reduce the number of damages in the future. Therefore, root cause is the most critical data element, and plays a large part in the analysis of the events reported.

As suggested by the Analysis of Data Element 6, and the Multi-Field Analysis above, the major root causes identified are as follows:

- Notification NOT Made
- Excavation Practices Not Sufficient
- Locating Practices Not Sufficient

The two largest root causes for facility events are the lack of one call requests by excavators prior to digging, and insufficient excavation practices. When looking at the entire 2007 data set, these percentages are very close, 35% and 34%, respectively. “Locating Practices Not Sufficient” is the remaining root cause group making up a significant and increasing share, 21%. It must also be noted however, that the “Notification Practices Not Sufficient” root cause group has also seen a steady increase since the 2004 Report, now accounting for 9% of the share. In addition, “Locating Practices Not Sufficient”, “Excavation Practices Not Sufficient” and “Notification Practices Not Sufficient” each have second-level root causes that can be explored to add further understanding to the events taking place. With more and complete data, this analysis could also lead to a better understanding of the factors that contribute to damage.

Based upon the facility events submitted with “Locating Practices Not Sufficient” identified as the root cause and with the Type of Locator being “Known”, the data indicate that facilities located by contract locators are damaged more often than those facilities located by utility owners. This may be due to the fact that contract locators perform a majority of the overall utility locates. As recognized in the industry, contract locators may be provided inadequate mapping information, may be responsible for multiple facility types on a single job site, and/or may have limited time to complete the locate request. While many of these variables remain unknown, this is an area of interest and will continue to be monitored in future years. However, there are too few events in this year’s data set with a reported origin of utility locates and a known root cause to perform a meaningful multi-field analysis of this data.

There are a significant number of facility events affecting Service / Drop and Distribution facilities involving lack of one call center notification and excavation with hand tools. Using the 2007 data with only known information for the applicable fields, the share of events involving “Service / Drop” as the affected facility and “Notification NOT Made” as the root cause was 40%. Of those, 63% listed “Hand Tools” as the type of excavation equipment used. The share of events involving “Distribution” and “Notification NOT Made” was 40%, of which 63% also involved “Hand Tools.” This may be due to the fact that some state regulations do not require one call center notification for excavation with hand tools.

Several measures that may help to reduce the number of damages may include but are not limited to: preventative training opportunities, public awareness programs, and effective enforcement of state damage prevention laws. Current legislation varies greatly from state to state, and perhaps benefits would be realized from more standardized enforcement.

2007 Estimate of Damages

In the CGA’s first annual Report, based on the 2004 data, the statistician provided an estimate of 675,000 damages per year in the US. This was based on the population and number of damages in the state of Colorado and extrapolated to the entire US. At that time, Colorado was the only state with mandatory reporting of damages and submitting data to DIRT. Since that time, data from another state with mandatory damage reporting, Connecticut, has become available in DIRT. In addition, housing-start data, which is a better reflection of construction activity, has been utilized. Incorporating this supplemental information, the statistician has provided revised estimates of the total damages in the US for 2004, and new estimates for 2007. These analyses provide similar results whether population or housing-starts are used as the basis for estimation.

2004 Estimate of Total US Damages			
Year of estimation	State data used	Basis for estimation	Total US damage estimate
2005	Colorado	Population	675,000
2008	Colorado and Connecticut	Population	416,000
		Housing starts	406,000
2007 Estimate of Total US Damages			
2008	Colorado and Connecticut	Population	256,000
		Housing starts	258,000

Together Colorado and Connecticut give a more accurate estimation of the number of damages in the US. As more states submit a complete dataset to DIRT, the estimate will improve.

Both Susanne Aref, PhD and Adam Martinsek, PhD approve of the ratio estimation method used to calculate this estimate.

Please visit <http://cga-dirt.com/estimate> for a full explanation of this total damages estimate.

Data Quality Index Indications

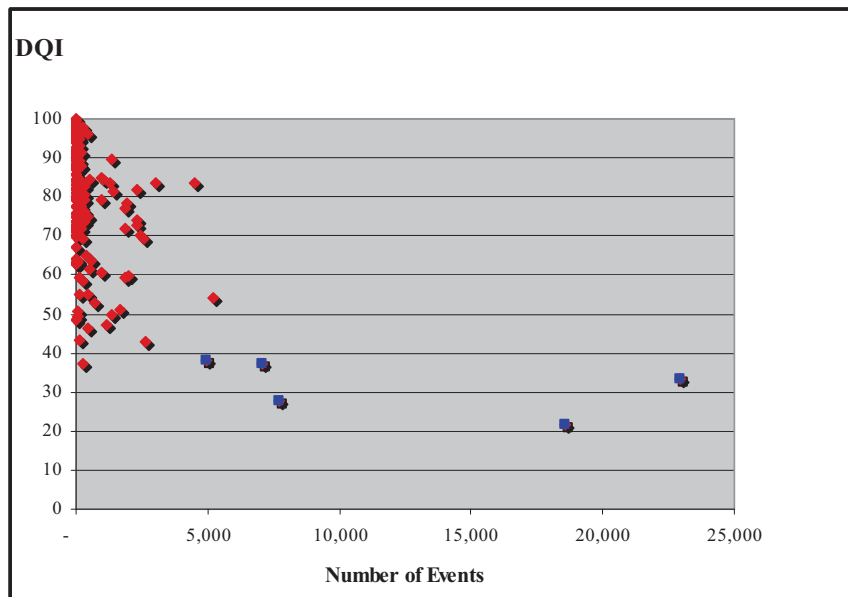
In response to a recommendation from the 2006 Report, the DR&EC developed the Data Quality Index (DQI) as a tool that allows stakeholders to review the quality (measure of completeness) of their submitted data within DIRT. The DQI can be regarded as an individual “grade” for an event record. The table below illustrates the breakdown of DQI for each individual part of the DIRT field form. 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 DQI for a set of records can be obtained by averaging the individual DQI of each record. The “Percentage of Overall DQI” column in the

chart represents the average of all 121,334 events in the 2007 data set, a disappointing 50%. Another approach is to calculate a DQI for the records of each individual data submitter, and then calculate the average of those. This is shown the column labeled “Percentage of Stakeholder DQI,” and comes to 78%.

DIRT DQI

Field Form Section	Description	Percentage of Overall DQI	Percentage of Stakeholder DQI
Part A	Who is submitting this information	100%	100%
Part B	Date and location of event	66%	75%
Part C	Affected facility information	59%	87%
Part D	Excavation information	55%	82%
Part E & Part F	Notification, locating & marking	73%	90%
Part G	Excavator downtime	14%	58%
Part H	Description of damage	24%	65%
Part I	Description of root cause	38%	75%
TOTAL WEIGHTED DQI		50%	78%

The reason for the difference in the two DQI calculations is that a small number of stakeholders submitting a large quantity of records with poor DQI (<40%) brings down the Overall DQI. Conversely, a large number of submitters with few records but good DQI improved the stakeholder DQI. This is illustrated in the chart below. The red dots indicate those stakeholders submitting smaller numbers of events, while the blue dots indicate those stakeholders submitting large numbers of events with a DQI less than 40%.



The DR&EC strongly encourages ALL stakeholders to align their underground damage and near miss collection and reporting procedures with that of DIRT. The submission of complete facility event reports provides more meaningful analysis and insight. As a reminder, the DIRT Report is a direct reflection of the efforts made by those who submit facility event information on an ongoing basis.

For more information on how DQI is calculated, please see <http://cga-dirt.com/dqi>.

Prior Recommendations - Status

This section provides a status update on recommendations presented in prior reports. The DR&EC adopted three recommendation status choices:

- 1) Under Review The recommendation is new or under consideration by the DR&EC.
- 2) In Progress The recommendation is being acted upon.
- 3) Closed The recommendation has been acted upon and is complete.

2004-7) The DR&EC should continue to develop ongoing metric(s) to help track damages and measure changes.

STATUS- In-Progress

Action Taken: Establishing ongoing base line metrics will enable the DR&EC to establish a consistent method of analyzing the number of facility events reported and facilities damaged. The DR&EC is limited to metrics that are provided on an annual basis as well as the information provided by stakeholders. The OCSI continues to provide one call activity information to be used as a possible baseline metric in response to the 2004-7 recommendation to define and collect baseline metrics. Several additional sources of information have been identified and recorded include: population migration, housing permits, housing starts, pavement miles, enforcement fines, apportioned federal highway funding, average bedrock depth, Associated General Contractors (AGC) employment and gross domestic product records. The DR&EC will continue to identify additional industry data sets to build upon the 2004-7 recommendation.

2006-1) The DR&EC should identify methods to improve the quality and completeness of event information.

STATUS – In Progress

Action Taken: The DR&EC developed and implemented the Data Quality Index (DQI), which is a score, or ‘measure of completeness’, for the single report or data set submitted. The DQI is calculated based upon the answers (or selections to the data elements, or fields within each Part) in DIRT, with more ‘weight’ assigned to some fields because of their value in analyzing the event. Those reports with complete information and selections other than “Data not collected” or “Unknown/Other,” will achieve a higher DQI. Submitters are provided the DQI for the single report or data set just submitted; and DQI reports can be generated utilizing the Query Wizard.

Using this information on the quality, or ‘completeness’ of the data submitted, stakeholders are able to identify where improvements (e.g. asking additional question on field report, using DIRT field form selections, etc) in their data collecting and reporting processes can be made. The DR&EC will continue to track and report on overall DQI. It is expected that the DQI will increase as stakeholders and users align their underground damage and near miss data collection and reporting processes to that of DIRT. Only with accurate and ‘complete’ data can meaningful analysis be made.

For more information on DQI, please see <http://cga-dirt.com/dqi>.

Recommendations - 2007

2007-1) The DR&EC should closely monitor whether facilities installed in a joint trench are less susceptible to damages. The share of 2007 events involving facilities known to be installed in a joint trench was 6%. However, only 21% of the 2007 events provided a Yes or No answer, and of that, 87% came from Region 6. Therefore, it is difficult to determine if there may be unique circumstances in Region 6, or if there is a widespread correlation between facility events and joint trench installations.

STATUS – Under Review

2007-2) The DR&EC should determine whether the type of locator has a direct relationship to the root cause of a damaged or near miss facility event. The DR&EC should analyze this relationship to determine the risks associated with contracting the location of facilities by a company that does not own the actual facility being located.

STATUS- Under Review

2007-3) The DR&EC should determine if there is a correlation between facility events involving Service / Drop and Distribution facilities, categorized as “Notification NOT Made”, and lack of a one call notification requirement when hand digging. If a correlation is found, the Best Practices Committee should seek to identify practices that will educate involved stakeholders in an effort to decrease the number of these types of events in the future.

STATUS- Under Review

SUMMARY TABLE OF IMPORTANT DIRT DATA ELEMENTS

DIRT Data Summary Table		Share of known data			
		2004	2005	2006	2007
Events Submitted		21,688	51,600	104,196	121,334
% CHANGE			138%	102%	16%
OCSI Regions submissions		7	8	8	8
Region 6		15%	27%	37%	32%
Region 4		21%	13%	16%	18%
Region 7		49%	22%	24%	17%
Others		15%	38%	23%	33%
Known stakeholder group submissions	:Events with Known Data	21,688	51,323	103,528	120,713
**See Section 3 Chart, Page 5.	known share of total events:	100%	99%	99%	99%
Natural Gas stakeholder		35%	61%	43%	36%
One Call stakeholder		51%	7%	21%	33%
Telecommunications stakeholder		1%	18%	31%	23%
Regulator stakeholder		12%	6%	1%	5%
Electric stakeholder		1%	5%	4%	3%
Others		1%	2%	1%	3%
Type of Facility Operation Affected	:Events with Known Data	20,279	48,921	100,294	108,025
**See Section 4 Table, Page 6.	known share of total events:	94%	95%	96%	89%
Natural Gas		55%	68%	49%	48%
Telecommunications		29%	21%	42%	38%
Electric		9%	6%	5%	8%
Cable TV		5%	3%	2%	4%
Others		2%	2%	2%	2%
Type of Excavation Equipment	:Events with Known Data	12,801	23,101	59,427	70,630
**See Section 5 Table, Page 6.	known share of total events:	59%	45%	57%	58%
Hoe / Trencher		71%	71%	70%	70%
Handtool		14%	17%	15%	16%
Drilling		9%	8%	8%	9%
Surface		6%	4%	6%	5%
Type of Root Cause	:Events with Known Data	18,267	34,775	33,179	44,375
**See Section 6 Table, Page 7.	known share of total events:	84%	67%	32%	37%
Notification NOT Made		57%	46%	38%	35%
Excavation Practices Not Sufficient		28%	33%	38%	34%
Location Practices Not Sufficient		13%	17%	18%	21%
Notification Practices Not Sufficient		1%	4%	5%	9%
Miscellaneous root causes		1%	1%	1%	1%
Type of Excavator	:Events with Known Data	16,642	27,548	36,698	59,568
**See Section 7 Table, Page 8.	known share of total events:	77%	53%	35%	49%
Contractor / Developer		80%	78%	80%	81%
Occupant / Farmer		13%	12%	10%	8%
Utility		4%	6%	5%	6%
Government		3%	4%	5%	5%
Type of Work Performed	:Events with Known Data	12,265	21,693	32,670	69,862
**See Section 8 Table, Page 9.	known share of total events:	57%	42%	31%	58%
Sewer / Water		27%	31%	36%	31%
Energy / Telecommunications		24%	24%	21%	24%
Landscape		17%	12%	9%	13%
Street / Roadway		12%	13%	13%	12%
Construction / Development		8%	10%	14%	11%
Fencing		8%	7%	5%	7%
Agriculture		4%	3%	2%	2%

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