

2023

No Call Damages in North Carolina

Survey Results and Analysis

Louis Panzer, Executive Director

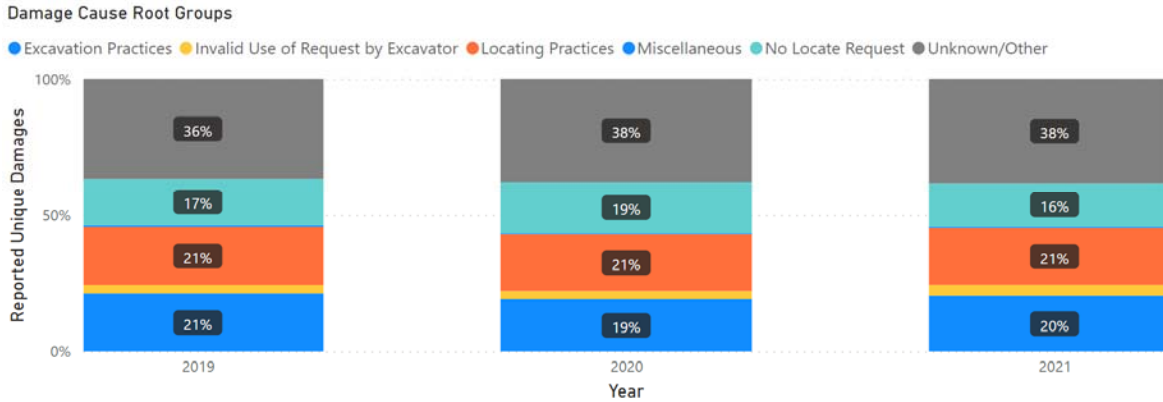




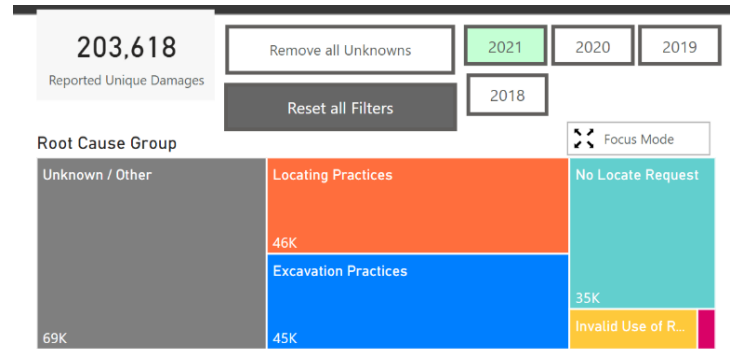
No Call Damages in NC: Survey Results and Analysis Louis Panzer, Executive Director

Background

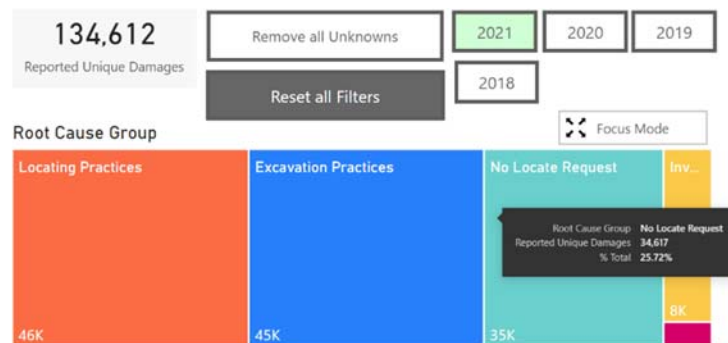
CGA DIRT report consistently reflects a high percentage of damages are attributable to “No Locate Request.” (<https://commongroundalliance.com/DIRT-dashboard>).



Unfortunately, “Unknowns” continue to top the list. *(This reflects the need for improved DQI, as recommended in the 18th DIRT Report.)*



When Unknowns are removed, 25.7% of the damages are attributable to “No Locate Request.” (34,617 out of 134,612 reported unique damages.)



Historically the industry has focused on this cause as being attributable to a lack of 811, or notification requirement, awareness. Subsequent research by contractors, Notification Centers and other groups have determined that awareness of 811 is considerably higher than represented in these statistics. So the question becomes, **why** someone who knows to contact and in fact has in the past, chooses not to in certain instances? This question prompted a survey of reported “No Call” damagers to ask them directly why they didn’t notify.

Methodology

In North Carolina, the operators have been helpful by providing permission to use data to improve the overall 811 process. This is evidenced by the Locate Resolution Partnership Committee (LRPC) which was granted permission to use information on tickets to better understand the persistent update ticket issue.

Gas operators in 2022 provided data to NC 811 of what they determined to be “no call” damages, with the ultimate goal being damage prevention and reduction. This information was used to perform outreach in the form of letters (appendix A), reminding those entities of the legal requirements and enforcement guidelines in the state. ***These letters alone were enough to begin a reduction, although incrementally, in the recognized “no call” damages on a quarter over quarter basis.***

Percentage of No Call Damages

4Q21-8%

1Q22- 8%

2Q22 - 6%

3Q22- 5%

4Q22-6%

In January 2023, A list of 2022 damages from a major electric operator were provided. The list included email addresses for 618 individuals. An additional 56 email addresses were obtained by a gas operator for damages occurring in July and August. Thus a total of 674 individual email addresses were utilized with an initial notice similar to the one sent by mail (Appendix B).

Many of the email recipients reached out, interested in telling their story as to “why” they didn’t call. These were collected and supplied as well along with free form answers with names removed (Appendix C). A survey was created and vetted with Lawrence Technology University to ask two demographic questions and one question regarding the damage itself.

The first two questions were, “What type of excavator best describes you or your company?” and “Please select the best description of the work that was being performed.” These questions and available options mirror the ones captured by DIRT. The main question for which we sought an answer was, “What do you consider the reason or reasons for the damage that was identified as having “no call?” Please select all that apply”.

The options provided were:

<input type="checkbox"/> I had no knowledge of 811	×
<input type="checkbox"/> Did not believe the work required a call.	×
<input type="checkbox"/> Was told by someone onsite that the area was clear.	×
<input type="checkbox"/> Saw marks on site and assumed we could use them for our job.	×
<input type="checkbox"/> Did not think we were going deep enough to require a call.	×
<input type="checkbox"/> Assumed someone else had made the call.	×
<input type="checkbox"/> Needed to get the job done immediately and could not wait for marks.	×
<input type="checkbox"/> Was working on private property and assumed I did not need to call.	×
<input type="checkbox"/> I had called previously for the area and didn't update the request. (Expired ticket)	×
<input type="checkbox"/> I had a ticket but the work was outside the boundaries of the area described.	×
<input type="checkbox"/> Experience suggested the marks would not be on time.	×
<input type="checkbox"/> I was not familiar with the 811 process.	×
<input type="checkbox"/> Process has not worked for me in the past.	×
<input type="checkbox"/> Other...	×

Note that there was an option for respondents to select “other” and to add their reasoning.

Survey Distribution and Return

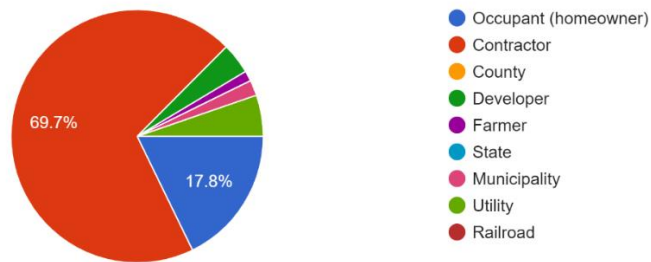
Of the 674 total possible respondents, 14 were returned as “undeliverable.” Three attempts were made to obtain participation. Ultimately 153 respondents took part in the survey. This represented a 23% response rate.

RESULTS

Excavator Type

Roughly 70% of the respondents identified themselves as contractors. Roughly 18% identified as Occupant (homeowner).

Please select the type of excavator that best describes you or your company
152 responses



Contractor	105
Occupant (homeowner)	23
Utility	10
Developer	6
Municipality	4
Farmer	2

Work Type: Contractors

Since contractors made up the bulk of the reports, let's first look at the work they were specifically doing. As this pivot table reveals, the top 8 work types made up 69 of the 105 reports from contractors (66%).

Contractor	105
Electric	12
Grading	9
Water	9
Building Construction	9
Site Development	8
Sewer	8
Landscaping	7
Water, Sewer	7

“Water”, “Sewer” and “Water,Sewer” combined made up 23 of the reports.

Work Type: Homeowners

Homeowners made up 18% of responses. The breakdown on their self-reported work types is below:

Occupant (homeowner)	23
Drainage	4
Building Construction	3
Site Development	3
Fencing	3
Water	2
Sewer	2
Landscaping	2
Building Construction, Telecommunications (including fiber)	1
Storm Drain/Culvert	1
Driveway	1
Grading	1
Grand Total	23

All Work Types

The top 10 work types reported make up 105 of the 153 reports (67%) and are broken down here:

Water	15
Sewer	13
Building Construction	12
Electric	12
Site Development	12
Grading	10
Landscaping	10
Drainage	7
Fencing	7
Water, Sewer	7

**“What do you consider the reason or reasons for the damage that was identified as having "no call?"
Please select all that apply”.**

This was the question we were seeking answers to. Because we are interested specifically in the awareness component lets look at the actual reported number that selected “I had no knowledge of 811.”

Although that was the first option available and would have been a likely answer if awareness was the cause, absolutely no one of the 153 respondents selected that as an option.

The data suggests that even homeowners who responded were aware of 811. The majority either felt that the actual job being done didn't require a call or that they weren't going deep enough or both. (12 total of 23 = 52%)

Occupant (homeowner)	23
Did not think we were going deep enough to require a call.	4
Did not believe the work required a call., Did not think we were going deep enough to require a call.	3
Damage was cause by [redacted]. They said we made the damage because it was below the fence however that fence had been up for years and there was no problem. We didn't call because we didn't perform any work.	2
line was exosed	1
area of work was underwater, under standing water from a natural spring for 33 years	1
Steps on side of house had been removed and new step foundation was been installed. Area had been cleared before by 811 when the steps were installed. Scape power line was found but we did not know so call [redacted].	1
93 yrs old and didn't know about utilities	1
Did not think we were going deep enough to require a call., Fine grading for driveway	1
Assumed someone else had made the call.	1
I had called previously for the area and didn't update the request. (Expired ticket)	1
I was called to fix it and realized it belonged to a utility provider.	1
Did not believe the work required a call., Did not think we were going deep enough to require a call., Hand dug for septic tank lid.	1
Process has not worked for me in the past.	1
Did not believe the work required a call., Helper decided to dig in the wrong direction	1
We didn't realize about the damage until 6 months later but now we know we need to call 811 before dig ground and we shared our insurance policy to the contractor that called us and we apologize	1
Did not believe the work required a call., Saw marks on site and assumed we could use them for our job., Was working on private property and assumed I did not need to call.,	1
Did not believe the work required a call., Was told by someone onsite that the area was clear., Did not think we were going deep enough to require a call., Needed to get the job done immediately and could not wait for marks., Process has not worked for me in the past.	1

Since the issue of depth and/or thinking a call wasn't required make up a large percentage of the reasons, let's look deeper into that. Here is what Homeowners responded:

Did not think we were going deep enough to require a call.	4
Occupant (homeowner)	4
Did not believe the work required a call., Did not think we were going deep enough to require a	3
Occupant (homeowner)	3
Did not believe the work required a call., Was told by someone onsite that the area was clear.,	
Did not think we were going deep enough to require a call., Needed to get the job done	
immediately and could not wait for marks., Process has not worked for me in the past.	1
Occupant (homeowner)	1
Did not believe the work required a call., Did not think we were going deep enough to require a	
call., Hand dug for septic tank lid.	1
Occupant (homeowner)	1
Did not think we were going deep enough to require a call., Fine grading for driveway	1
Occupant (homeowner)	1
Did not believe the work required a call., Helper decided to dig in the wrong direction	1
Occupant (homeowner)	1
Did not believe the work required a call., Saw marks on site and assumed we could use them for	
our job., Was working on private property and assumed I did not need to call.,	1
Occupant (homeowner)	1
Grand Total	12

A key takeaway from this is to make sure the fact that **all excavation activities** are stressed in education and that it is made clear to **take depth expectations out of the equation.**

Below breaks down the same reasons but by work type being done and by all respondents.

Did not believe the work required a call.	11
Sewer	2
Liquid Pipeline	2
Landscaping	1
Building Construction	1
Drainage, Sewer	1
Electric	1
Site Development, Grading	1
Fencing	1
Grading	1
Did not believe the work required a call., Did not think we were going deep enough to require a call.	3
Site Development	2
Water	1
Did not believe the work required a call., Did not think we were going deep enough to require a call., Hand dug for septic tank lid.	1
Sewer	1
Did not believe the work required a call., Helper decided to dig in the wrong direction	1
Building Construction	1
Did not believe the work required a call., Saw marks on site and assumed we could use them for our job., Was working on private property and assumed I did not need to call.,	1
Building Construction, Telecommunications (including fiber)	1
Did not believe the work required a call., Was told by someone onsite that the area was clear.	3
Fencing	2
Site Development	1
Did not believe the work required a call., Was told by someone onsite that the area was clear., Did not think we were going deep enough to require a call., Needed to get the job done immediately and could not wait for marks., Process has not worked for me in the past.	1
Landscaping	1
Did not believe the work required a call., Was told by someone onsite that the area was clear., Saw marks on site and assumed we could use them for our job.	3
(blank)	2
Landscaping	1
Did not believe the work required a call., Was told by someone onsite that the area was clear., Was working on private property and assumed I did not need to call.	1
Grading	1
Did not believe we were in an area that needed marked.	1
Water	1
Did not think we were going deep enough to require a call.	10
Drainage	2
Grading	2
Road Work	1
Water	1
Sewer	1
Building Construction	1
Electric	1
Landscaping	1
Did not think we were going deep enough to require a call., All lines should be deeper than 4" especially at the curb.	1
Curb/Sidewalk	1
Did not think we were going deep enough to require a call., Assumed someone else had made the call.	2
Fencing	1
Electric	1
Did not think we were going deep enough to require a call., Fine grading for driveway	1
Driveway	1
Did not think we were going deep enough to require a call., I had a ticket but the work was outside the boundaries of the area described.	1
Site Development, Grading, Storm Drain/Culvert, Water	1
Grand Total	41

Analysis

Some key takeaways from this exercise and the survey itself include:

- 1) Even among self-reported reasons for not notifying, 0% of the respondents indicated they didn't know about 811.
- 2) Ultimately, as these were presented to NC811 as a list of "no call" damages, it is likely that they will be posted to the CGA DIRT using that "failure to call" as a root cause.
- 3) A percentage cited other reasons for the damage, such as working on an expired ticket or using someone else's marks or "taking someone's word" that the site was clear. Several assumed someone else was responsible for making the call.
- 4) Although statistically relevant, the survey results are mainly from a single type of damaged facility (electric) and only for damages in a single state.
- 5) Depth was frequently cited as a reason for no notification. It was also suggested that the existing facilities were not at a depth they expected. This is another educational opportunity to reinforce "every dig, every time."

Challenges and Conclusions

The first step to any endeavor such as this is to understand what it is you want to measure. Having a clear goal helps define the correct question to ask. In some ways, allowing the respondents to select from more than one reason clouded the results. Perhaps limiting to one selection in the future would help clean up the results. Otherwise, the multiple responses could be weighted, such as is done to handle multiple reports of the same incident with different causes identified.

A key challenge is to gain trust from the respondents. From the time they were initially reached out to, many were skeptical as to the motives in conducting the research. It had to be reinforced that I was not with any claim recovery agency or utility. Once that was understood, many were excited to participate to have their side of the story told.

A major conclusion is that the "no notification made" component of the DIRT report needs to be further analyzed using a similar method in other states. This same concept can be applied to Locate causes, specifically reasons applying to practices in general. Previous research conducted (["Minimizing Underground Infrastructure Damages: Utilities Locators' Perspectives"](#)) suggest a variety of reasons for locator associated damages from workforce shortages to increased time pressures to issues with the excavation requests themselves. Perhaps a similar survey widely conducted among locators and specifically tied to the CGA DIRT categories might break down opportunities for lowering associated damages.



www.nc811.org

September 28, 2022

«Damager_Name»

«Damager_Address»

«Damager_City», «Damager_State» «Damager_Zip_Code»

«Damager_Name»:

A recent damage, or damages, was reported to North Carolina 811 indicated that you or your company did not place a locate request prior to beginning your excavation. Per State Statute Article A, "Underground Utility Safety and Damage Prevention Act":

§ 87-122. Excavator responsibilities.

(a) Before commencing any excavation or demolition operation, the person responsible for the excavation or demolition shall provide or cause to be provided notice to the Notification Center of his or her intent to excavate or demolish. Notice for any excavation or demolition that does not involve a subaqueous facility must be given within three to 12 full working days before the proposed commencement date of the excavation or demolition. Notice for any excavation or demolition in the vicinity of a subaqueous facility must be given within 10 to 20 full working days before the proposed commencement date of the excavation or demolition. Notice given pursuant to this subsection shall expire 15 full working days after the date notice was given.

Please note that this law is in place to protect you, your workers and the public from any incident that may arise from making contact with underground facilities.

These incidents can cause delays, injuries, and costly damage repairs.

You should also know that NC statute includes a provision for enforcement of the Act. Should a complaint be filed, and you or your company be found to be in violation of the law, penalties can include training and fines up to \$2,500 per violation.

A copy of the law may be found here: <https://nc811.org/north-carolina-law/>

North Carolina 811 is required by statute to perform education of the responsibilities of all stakeholders. I wanted to personally reach out to let you know that any and all excavation occurring in or in proximity to public Rights-of Way require a notice be requested and that any damages must be reported to both North Carolina 811 and the damaged utility owner.

Respectfully,

A handwritten signature in black ink, appearing to read "Louis Panzer".

Louis Panzer

Executive Director, NC 811

336-707-1736

APPENDIX B



www.nc811.org

January 24, 2023

(Name removed)

A recent damage, on 1/5/2022 at 2912 Polkville Rd, Shelby, was reported to North Carolina 811 and indicated that you or your company did not place a locate request prior to beginning your excavation. This letter is a courtesy to share the legal requirements for excavation in the State of NC. Per State Statute Article A, "Underground Utility Safety and Damage Prevention Act":

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Your help is requested in better understanding why a call was not made in this instance.

Please note an anonymous survey will be coming soon and your participation will help us to improve messaging to be certain the requirements are understood.

Respectfully,

A handwritten signature in black ink, appearing to read "Louis Panzer", is written over the typed name.

Louis Panzer
Executive Director, NC 811

336-707-1736

Collected Comments from No Call Survey
(company names redacted)

2 errors occurred. 1-we did not call in a locate 2-GC told us we were clear.

811 needs to have options to setup tickets to auto renew. Make it more user friendly

As you can see by the answers on the second question, we are involved in many different types of work. We are currently building a park, doing a complete reconstruction of 2 blocks of downtown, installing a water line, etc. We didn't realize the ticket had expired and was digging out a stump from the sidewalk. The red marks were there behind where we were working. We were cutting the roots with a target saw and cut into a power line with the saw. Once [REDACTED] crews came it was found the lines weren't marked correctly and this was a second line in the area. Since our ticket had expired we were deemed at fault.

Called 811, waited 2 weeks. Nobody showed. When I finally got some feedback, it stated there was no access to the property, which was not true

Electrical line was only 12" underground. You should not have to call 811 to bury a tree in a yard. The electrical company was a bunch of jerks that day.

Had 2 houses side by side. Called for power on both. Noticed that one of the houses did not have underground power installed and assumed the other house didn't either. Started digging waterline and hit the power line

Had no knowledge of any underground being in that area

hired a homeless to dig a short 18 inch deep ditch did not know he nicked utility until a few months later

Homeowner being the builder of the property had marked the places he wanted the trees installed. He told us he knew where everything was and had marked tree locations accordingly. Once we hit the line he told us [REDACTED] had come out unbeknownst to him and installed that line without his knowledge of the location.

I called the job site for locate and have all the ticket numbers.

I was called to report it to the utility provider. I nor my crew was working in the area nor made any repairs to this problem. I called to report the problem and was not in the same county or state when it happened.

I was removing trees from a wooded lot. Some trees were 2 feet in dia. When we pulled a 5" tree from the ground. We did not dig it out, we pulled it out only to find that its roots were warped around the high voltage wire. The area was marked for the water company because they were told that there was a main water line that they needed to tap into. They called and had the line marked. But only the water line was marked. They dug with in 2' of the power line which was not marked and fortunately did not hit it. Why would I think that there would be a power line in the woods of my property. The person who owned the whole development for ever, who I purchased the land from also didn't know that the electric company had put the wire there some 40+ years ago. It also was not on the township plans. I am very upset that I had to pay for this when nobody had any record of this line being put there.

Thank you
[REDACTED]

I was working for a friend not even under my company name just helping someone out he told me he knew where all the utilities were they were outside of my scope of work so I assume there was no power or utilities due to what he told me come to find out the neighbors utilities ran through his yard and he was not aware

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I would love to discuss this incident with someone.

I would love to discuss this incident with someone.

Im a retired construction engineer of over 50 years experience. Was not aware that you place electrical service lines under water

Job was emergency water leak late at night

██████ did not install there work as described in the ██████ installation guide and standards. ██████ was over a foot shallow.

My biggest frustration is that although I take the time to put a ticket in, 90% of the time they come back incomplete and then I need to submit a 3- hour notice which isn't always done within 3 hours. We schedule these job a week out to give time for the 811 process and then have to postpone or decide to move forward anyways taking the risk. I understand the importance of calling in the 811 tickets, but the follow up takes up so much of my time. I feel that you preach to get them called in, I do, and then i just receive an email stating that they were not done. It's all a bit frustrating.

New construction no utilitys also 811 is not 3 days anymore sometimes takes weeks for scheduling g

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no

No work was performed on our end. We didn't cause any damage. However we were blamed for it.

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Our lines only required to be 12-18 inches deep and power lines are generally 24-36 so we didn't expect them to be shallow. In 30 years in business never hit a power line before

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power company did not bury feeder wire to proper depth , we measured the depth at 12 inches

properly line of an undeveloped overgrown lot. We were digging perk holes for the county.

Really doesn't do any good but homeowner we're grading it was marked 4 times

Soil had already been performed in the area, we were just doing a more indepth look at the soil. There is nothing onthe property and the power actually came in through what was always the only good septic soil, reducing what could be done out there.

Thank you

Thank you

The biggest problem I see is the installers not doing their job and getting in and out as fast as possible

The dig was to place a drain pipe that came off the gutters of the building. We dug down 8 to 10 inches down for slope. Electric underground should be down 30 to 36 inches. Had no reason to believe it was down less then a 8 inches. This was a poorly done job by ██████ contractor only a couple months before.

The general contractor for this project mage the call,.

The general contractor for this project mage the call,.

The locate services should be held responsible when they continuously delay locates. They also need to be restricted to 24" on each side. Their job directly effects our ability to do ours.

The power line was only 10 inches in the ground where it was hit.

The property was marked with 811 several months prior and I believed we were out of the way of the previously marked utilities.

The property was marked with 811 several months prior and I believed we were out of the way of the previously marked utilities.

This was in a new development with new roads. The developer had started installing undergrounds and we thought the area was clear. We normally don't need locates because we are installing new work with no one around except where we tie into existing streets

Typically [REDACTED] line is 30" deep, I was only digging 18" and hit the wire. House was newly built and homeowner was confident where the wire was, but depth was not per usual, I accidentally hit the wire.

We called 811 and I have the ticket numbers. We also didn't damage any lines. If we had damaged any lines we would have notified the appropriate company.

We have active 811 tickets on all of our sites sometimes it encompass up to 50 acres we update them every two weeks we have found that the locate companies are understaffed sometimes they do not come out in a timely fashion and the streets that are on the drawings have not been updated by Google or turned over to the municipalities. There are major gaps in the system and then greater Charlotte area due to the rapid growth. Right now there are many flaws in the NC 811 system that need to be addressed or there will be continued to be utility strikes. We have a person in our office that actively files and updates are 811 deck tickets but there's only so much you can do on the contractors and in my opinion the utilities and the locating companies need to step up maybe we should start a coalition with all parties involved and meet once a month to discuss how we could improve the system!

we have emergency situations in the middle of the night that do not allow for time to wait on a locator to show up

We hit the primary from the transformer at 18" that is not the correct depth listed in the NEC code book

We were developing the hole construction and we knew where the power lines were installed, the operator just dug a little too deep.

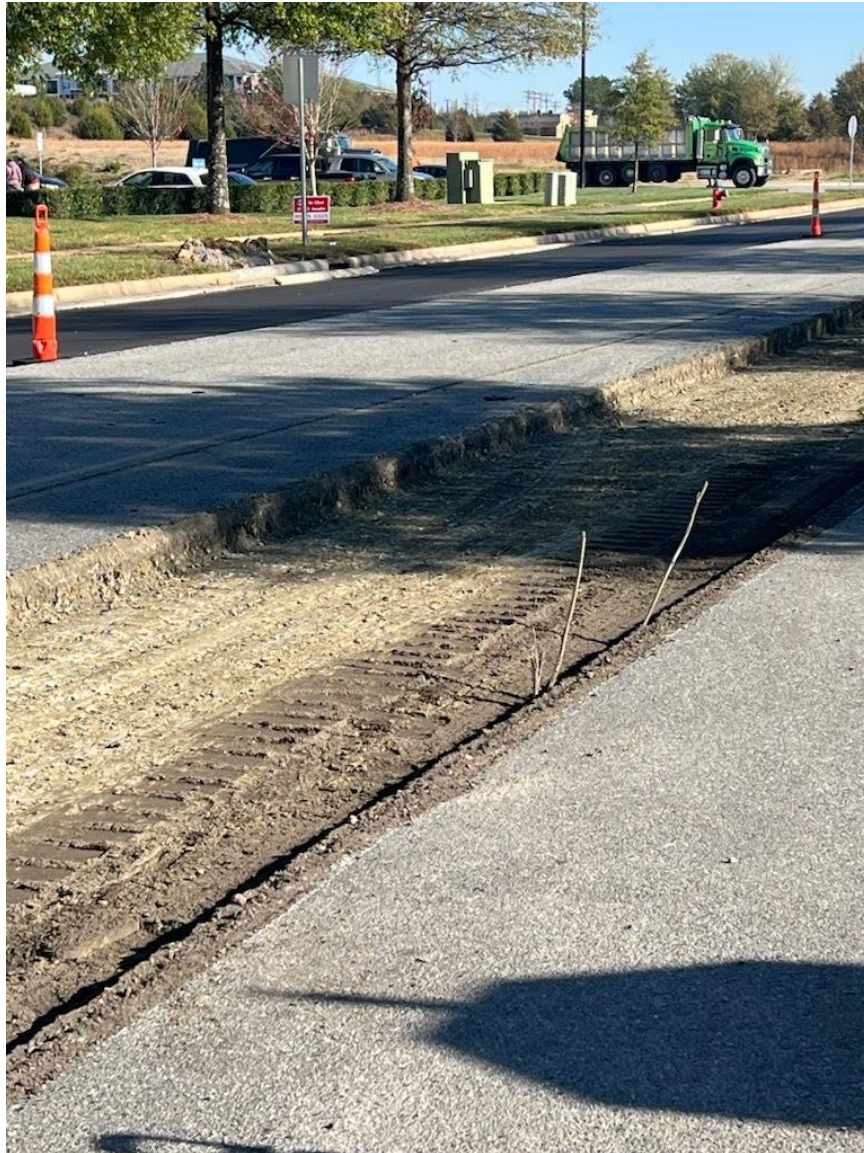
we were installing a deck and the homeowner requested that we expand it further by a few feet. We only had 3 days to get the job completed to stay on budget and the new posts were in line with the current posts. Calling 811 takes 4 work days (the day you call doesn't count)

We were working hourly rates at the direction of the property owner and assumed he had called in locates for the project.

Collected Email Responses to initial letter

- locate ticket [REDACTED] was placed for all work in this area. direction given locate from new subdivision to address 760
- The property was located, The power line was less than 8 inches deep.
- We did have the area we was working in located..
- The line was located by the grader. We exposed the line by hand digging, After rain filled in the ditch the line was covered with silt and hit with a machine. This was also a private line to the house
- This damage was hit on Wells Fargo private property. We did private utility locates and miscommunication on calling 811. I thought they did and he thought I did. You can tell by our 811 records that we know and are aware to call 811. Please let me know if you have any further questions.
- Neither me, my company or any of my subcontractors had anything to do with the damages at 208 Irving place. Please contact me directly to discuss at
- I have looked at [REDACTED] in Graham. Our project (Stillhouse Farm) is about 0.25 miles south of this address. I am not 100% positive, but our company should not have been in this area. How did you get a report indicating it was us?

- My last name is not Verlander. It is Wacheldorf. I have never in 35 years called locations for a sidewalk. Usually all wires are in the ground more than 4". We just scratched the surface. I know you probably don't care but why would the wires for a street light be that close to the surface. Looks to me that it is an installer issue.
- The damage was caused by [REDACTED] incompetent technicians who decided to blame us for the damage they caused. Since it was their word against ours, we had to take the blame and pay for the damages those imbeciles caused. That was an unfair and unjust act but it's done and over with. I don't need any reminders since I was not the one who did anything. Maybe reach out to [REDACTED] so they can better train their inept workers.
- The incident in which this is referring was not an excavation project. The project was an asphalt resurfacing contract with the City of Kannapolis. Our scope of work was milling (removing of old pavement) and resurfacing the road and was limited to roadway only. The lines in question were 3.5" deep and in the existing asphalt. I have attached pictures for your review.





- For this specific community, we do not do any cutting on existing grade, that would be another company we believe is called [REDACTED]
- Would you be so kind as to call me at your convenience to discuss these incidences? Because we did have NC811 dig tickets in place . I look forward to hearing from you. Have a great day.
Regards Andy
- I called 811 and received an all clear
- Sorry - just re-read and this was back in June. We have since Lauren door lesson. We paid over \$8,1 just 000 for the damage.
- Could you give me some more reference on this? To my knowledge, we haven't worked on that street.
- I was just the person on site that called [REDACTED], I had nothing to do with nor was I involved with the work being done. The work was done by a sub contractor. That job was called in and not marked in the correct areas for the record. Please get my name out of the system, again I was just the guy who called the emergency [REDACTED] number.
- We were working on a large property and did not realize we got onto an adjoining property that the same company owned. Property lines were not marked and there was a residence behind the work area we were working at. We were fined and we paid

- This was last year so why would we just now be getting this?
- There was an active updated locate on the entire property under the General contractor. The dig was on private property. The general contractor was present with my crew during the dig. We knew exactly where the lines were located, however the depth was the question. We had the hole excavated to almost the depth we needed to be and both my lead guy and the superintendent for the GC made a bad call to go a little deeper and the power line that served the facility was nicked.
- There were no damages resulting from not calling 811
- This unfortunate accident happened about a year ago, and for your information 811 was called and they did the marking, they missed the one line we damaged. The Ticket was created by [REDACTED] office manager at the moment.
- Thanks for reaching out, I appreciate the effort of your agency is making, to give contractors like myself to explain the situation that led to the mistakes made. Unfortunately I was not aware I had to call myself, but a call was made, but a call was made by General contractor who is doing the work for the owner. The Company I'm referring to [REDACTED] and person representing the firm is [REDACTED] [REDACTED] I can provide more information if you would like.
- I believe this was an accident. One of the trade partners pushed down on a silt fence stake and drove it into the line. It probably was not intentional just an ignorant trade. Maybe a skidsteer operator pushed it down with a bucket? If I was not standing there when it happened then I will never know exactly how or who did it.
- The explanation is very simple in this case. We called 811 for marking utility lines before commencing the digging of our garage foundation footings. Lines were marked on our property. **NO MARKINGS** of any kind were made in the area of our dig, so we proceeded to dig 3 ft down required for our footings. No problem yet. Before pouring cement, we had an engineer test the soil. He concluded that the soil was "fatty clay" and thus the footings needed to be ~5 ft deep with 2ft of gravel as a base layer. So we had to dig down deeper. Since there were no markings made in the dig area prior to original commencement, we assumed we could dig deeper with no issue. Wrong! During this second dig process, the crew struck an underground [REDACTED] power line. Remember, this power line was not marked when we called 811 before ever breaking ground.

Despite my belief that we were not at fault for this incident, I still paid the repair cost to [REDACTED]

- Where did you get this information? I have record of a call into 811 for 816 McDonald Rd
- Good afternoon and I hope this finds you well. I have received the below email in regard to the damage on 6/3/2022 of the [REDACTED] facility. Please understand that [REDACTED] takes the safety of their employees, public health, as well as underground facility safety very seriously. It is our number one priority that everyone works safe, and facilities go undamaged. NC811 is a daily item that is of utmost importance to our daily operations. Please know internally this incident was handled with a full investigation of the issue at hand as well as steps were and are taken daily to ensure this does not occur again. Our supervisors and employees have been trained in the requirements of 811 as well as the parameters to be followed as an excavator. This site had current ongoing tickets with a lot of newly installed facilities. This instance was just an oversight of work area and in no way total disregard to the

811 laws and practices. Please understand we strive each day to be damage free and it is our number one priority to continue this way. We are and will continue to enforce as well as educate underground utility safety and the practices of 811 with current and new employees. Please feel free to reach out at any time regarding this issue.

Thank you for your help and understanding regarding this matter.

- Who was the job for ? I can't find where I worked here
- And why are you messing me about this?
- A call was not made because we were there the day they dug and flagged the ditch line.
- The problem was not knowing where the line was the problem was the digging crew only dug and placed the wire at 14" deep. this was confirmed by the [REDACTED] inspector the day they came out. The law says all supply wire to house is a minimum of 24" deep. we have video, witnesses and the [REDACTED] engineer who originally flagged the dig line based on the final grade of the front yard.

I was willing to work with [REDACTED] and we had agreed to split the cost until they charged for 2 hrs repair time (???) when it only took 20 minutes. we dug the ground open at the break so they could easily repair. They should have charged the actual time it took and then we would have been done with this. If any one would like to check the depth of the wire they are welcome. they'd find out it is 14". This is a common problem with the install crews according to other crews who do our work. it has been known that they dig only 10-12". This is incredibly dangerous practice and a practice that needs to be addressed. we are usually on the job and or nearby. This day we were working in the back yard. When they were done we all said it was too fast Why because they only dug 14"

- Thank you for the information and I understand the seriousness of the situation. In the future I will make sure that all dig safety procedures in the future. Thank you
- Also my apology to you for i did think you were representing [REDACTED]. I also thank you for what you do for the construction industry. I started digging ground 40 years ago before markup for underground was even around in most areas. Your work saves us a lot of time and teaching the concepts to the new and young guys is super important. you deal with left to right markings I believe it would be very vLuBle if they also did depth marking. At least then people would learn how important it is to dig deep or deeper into ground for all wire and pipe

Minimizing Underground Infrastructure Damages: Utility Locators' Perspectives

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ABSTRACT

Thousands of damages to underground utilities, including gas, water, and sewer, occur every year. Damages to underground utilities have a significant impact on national and local growth, as well as citizens' wellbeing. It is crucial to reduce damages to underground utilities. Currently, damage prevention effort consists of three-steps: (1) construction firms must contact state notification centers (one-call centers); which in turn (2) notify utility owners who must locate their utilities on the ground; and (3) construction firms (i.e., excavators) must respect marks and exercise care around marked utilities while excavating. This study investigates the perspectives of utility locators regarding current practices. Among other findings, the study reveals that the lack of clear communication between locators and excavators negatively impacts the current damage prevention process. The findings will contribute to better damage prevention processes and a lower number of strikes to underground utilities.

INTRODUCTION

Underground infrastructure is an integral component of any urban community. In the United States, the huge underground maze is made up of roughly 35 million miles (Nelson et al. 2012), and this number is expected to continually increase given population growth and the requirement to attain the provided services (i.e., sewer, water, and gas). Damages to subsurface utilities is a widespread issue that construction firms often face (Al-Bayati and Panzer 2019a). There were 341,609 unique reported damages to subsurface utilities in the United States and Canada in 2018, which is higher than the number of damages in 2016 and 2017 (Common Ground Alliance (CGA) DIRT 2018). Millions of miles of subsurface utilities, including gas, water, and sewer, have been installed underground, which increases the likelihood of striking them (Al-Bayati et al. 2019). The impacts of damages include project delays, costly repair expenses, environmental damages, and fatal and non-fatal injuries. Thus, direct and consequential costs could be substantial. The current practice to reduce damages to subsurface utilities consists of the following steps (Al-Bayati and Panzer 2019b):

1. Contractors (i.e., excavators) are required to contact one-call centers
2. One call center notifies utility owners
3. Utility owners must mark their utilities
4. Contractors should respect the marks and exercise care within the tolerance zone established around the marked utilities to avoid damages.

The key components of current damage prevention efforts are excavators, one call centers, and utility locators. This process is intended to form a loop of communication that informs different parties about the requirements, responsibilities, and steps needed to reduce damages to

subsurface utilities. Researchers have identified several root causes that contribute to subsurface utilities, including excavation practices (e.g., failure to use hand tools when needed, failure to protect/shore underground facilities, and improper backfilling practices), locating practices (e.g., utilities that have not been located, marks are faded or not maintained, and inaccurate marks), and notification error (e.g., failure to notify the one-call center/811 or providing wrong information). For example, there were 12,024 reported damages in the state of North Carolina in 2018. Figure 1 summarizes the causes of damages in 2018 based on information provided to NC 811 without the unknown inputs. The Other Causes category includes cases where damages were not a direct fault of any of the involved parties. Relying on these root causes as singular explanations, however, would be based on the assumption that the process happens in a vacuum where there is no overlap between the identified causes. The causes overlap in real life. Accordingly, this study aims to investigate the influence of lack of communication between the stakeholders (i.e., excavators, locators, and one call centers) on damages to subsurface utilities.

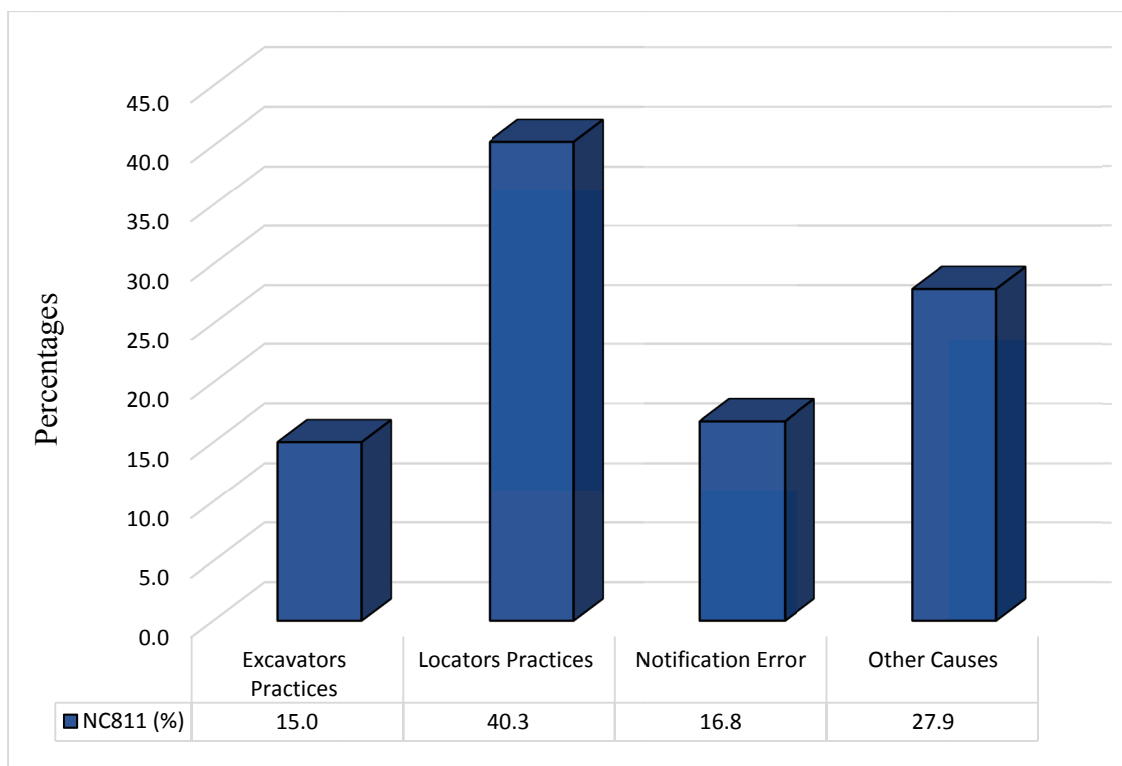


Figure. 1. Root Causes Proportions

METHODOLOGY

A partnership with the NC 811 notification center has been established to achieve the study goal. A survey was prepared to solicit the locators’ opinions regarding six aspects: excavators provide white lining (i.e., marking excavation route to outline the dig site before the locator arrives), quality of the locate ticket information, accurate maps provided by utility owners, training quality, and locate equipment. The survey aims to assess the influence of factors other than the already identified factors. Accordingly, the responses were analyzed and scores were

generated for each of the questions. Furthermore, statistical analysis was conducted to measure the statistical significance of the responses.

FINDINGS

The survey was administered during Spring 2019, and 98 responses were received. The job titles of the respondents fell within the following categories: locate technician ($n = 44$, 44.9%), locate manager ($n = 30$, 30.6%), and locate supervisor ($n = 24$, 24.5%). The experience of participants fell within the following: more than 3 years of experience ($n = 81$, 82.6%), between 1-3 years of experience ($n = 14$, 14.3%), and less than 1 year of experience ($n = 3$, 3.1%). The educational background of respondents mostly falls within U.S. high school ($n = 26$, 26.5%) and some college or beyond ($n = 68$, 69.4%). The average age of participants is 43.2 years ($SD = 11.1$). Finally, the respondents came from North Carolina ($n = 43$, 43.9%), New Jersey ($n = 10$, 10.2%), California ($n = 8$, 8.2%), South Carolina ($n = 6$, 6.1%), and other states ($n = 31$, 31.6%). Participants were asked to score their confidence from 1 to 10, with 10 being *high* and 1 being *low confidence* in the following aspects:

- Utility owners' maps
- Locate equipment
- Excavators provide accurate locate description
- Excavators provide white lining
- Training provided to locators
- Quality of the locate ticket information

A factorial ANOVA was conducted to determine the significant statistical differences, if any, in confidence based on participants' feedback. The results indicate a statistically significant difference in the score of confidence ($F = 322.96$; $df = 5,579$; $p < 0.001$). A statistically significant difference means that there is less than a 0.001 chance that the difference in scores could be attributed to random effects; however, the ANOVA test does not tell where the statistical differences lie. Accordingly, Tukey's Honestly Significant Difference (HSD) tests were conducted on all possible pairwise contrasts. The results revealed locators are less confident in providing white lining by excavators (score average 3.54), followed by locating description provided by excavators (score average 4.13), and quality of locating ticket information (score average 4.83). The locators' confidence level in utility maps was found to be less than the training they received, as well as the locating equipment (score average 5.66). Overall, an average score of 5.66 suggests that utility maps do not provide the actual utility location on a regular basis (as planned versus as built), which requires further efforts to update utility maps. Table 1 illustrates the groups that were found to be significantly different ($p < 0.05$). The overall results indicate there is a clear communication gap between locators and excavators (i.e., white lining and locate description). This lack of communication contributes to delayed and inaccurate locates, which in turn, increases the likelihood of striking underground utilities.

DISCUSSION

The influence of communication between stakeholders on subsurface utility damages has been rarely discussed in the literature. The findings of this study indicate the necessity of communication between stakeholders, especially locators and excavators, on the damage prevention process. Accordingly, the study reveals less confidence in crucial communication

aspects, including white lining, locate description, and ticket information (i.e., groups 1 and 2). This finding suggests that locators experience difficulties finding the excavation area. As a result, the damage prevention process appears to be negatively impacted by the lack of communicating identified by this study. Locators who arrive at a construction site where the excavation area is not clearly marked will spend a longer time locating unnecessary subsurface utilities, which could impact the overall accuracy. In 1998, the Pipeline and Hazardous Materials Safety Administration (PHMSA) convened a meeting of 16 industry stakeholders from underground utility safety and damage prevention industries that resulted in CGA's best practices guide (CGA 2019). Thus, it is hoped that the CGA Best Practices Committee considers the findings of this research as a potential inspiration for future recommended best practices. The accuracy of maps provided by the utility owners (i.e., group 3) seems to be a challenge that should be addressed by utility owners. Accurate maps are crucial to delivering accurate and timely locates. Lack of as-built information and drawings is a leading cause of damages, as suggested by Goodrum et al. (2008). Similarly, Makana et al. (2016) suggested that the lack of effective communication prevents data sharing between stakeholders, which increases the likelihood of damages. Finally, locators seem to be more confident about the training provided to them and their locate equipment.

Table 1. The locators' confidence from less to most confidence – ANOVA test

Group #	Aspect	Score Average
1	Excavator provided white lining	3.54
2	Excavators provide accurate locate description	4.13
	Quality of the locate ticket information	4.83
3	Utility provided maps	5.66
4	Training provided to you	7.34
	Locate equipment	8.14

CONCLUSION

The responsibility of protecting infrastructure from third party damage falls on all parties involved in the process, especially locators and excavators. The success of each element of the safe digging process is predicated by the action taken in the previous step. Therefore, all parties should review their contribution to the overall system and make corrections that can prevent damages. Additionally, the overall process should be well understood by stakeholders to help

protect life, health, and property. Damage prevention acts were proposed and implemented to ensure that workers and citizens are protected, and hence, damages are reduced. Beyond stakeholders' responsibilities, communication between involved parties is crucial to ensure the acts deliver their intended purpose. Accordingly, the findings of this study will aid in improving existing practices in damage prevention, and therefore reduce associated direct and consequential costs of damages. The authors hope this research can help others to follow suit in identifying the stress points within their own jurisdictions to affect meaningful industry change.

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