

# Improving Upon Our Dig Laws:

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Proactive Steps to Combat Five  
Years of Rising Excavation Damage



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# Executive Summary

The Common Ground Alliance (CGA) recently published its annual Damage Information Reporting Tool (DIRT) Report, Volume 16. The DIRT Report is the only source for comprehensive data and trends on excavation damage to underground facilities across the country. The Report offers industry leaders and policymakers important insights into inadequacies in the damage prevention process.

This year, the DIRT Report saw several improvements, including clearer data than previous reports, an improved statistical model for estimating total damages, and a set of recommendations well suited to achieve positive impacts. In light of this, our paper is less critical of the DIRT Report than we have been in the past and instead focuses on proactive steps to implement needed reforms.

## The primary takeaways from the 2019 DIRT Report:

- In a five-year upward trend, estimated total damage reached **532,000 incidents** – an increase of 68 percent over the last 5 years
- Excavation damage cost the U.S. **an estimated \$30 billion** in 2019
- CGA is advocating for **systemic change** to improve the damage prevention process at every level

In light of the increasing damage trend and multibillion-dollar annual costs, CGA makes the need for major change clear. Writing in the introductory letter, CGA president and CEO, Sarah Magruder Lyle, stated “[t]he 2019 data suggests that targeting a singular practice or stakeholder group is unlikely to yield systemic improvements.” She explained that “significant improvements will only happen if we collectively look at opportunities to reduce damages through comprehensive change.”

The DIRT Report comes with a host of well-targeted recommendations, includes a review of certain best practices, addresses pressure put on locators, recommends the adoption of new technologies, and calls on decisionmakers to “explore *all* opportunities for improvements to the damage prevention process – both modifications to individual stakeholder performance, enhancements to the current system as well as potential structural change and innovative solutions to address persistent challenges.”

In order to bring about comprehensive change, and recognizing that low-hanging fruit has already been harvested, CGA states that “the remaining issues facing the industry are more challenging ones.” This appears to be a recognition by CGA that the way change has been attempted in the past is not adequate. As an example, creating Best Practice Guides and sharing educational material has been a major focus of CGA committees and staff, but damages have soared in the last five years in spite of these efforts. Tweaking that approach will not be enough.

CGA acknowledges limitations of its Best Practice Guides, stating that “the biggest categories of damage root causes correspond to Best Practices that lack specificity, likely reflecting the difficulty of achieving consensus among all 16 CGA stakeholder groups, which is required by the Best Practices process.”

A lack of specificity is a major impediment to meaningful best practices; but revising them, as suggested by CGA, is only a small part of what is needed. Perfectly formed best practice statements will not prevent damage unless they are put into practice across the board.

One way to make headway on best practice implementation is a certification program, which may help get stakeholders engaged. Not only could this help reduce damages by encouraging adoption of the best practices, but it would provide useful information in the form of statistics on how best practices are being implemented and how many damages were related to actions by certified stakeholders versus damages that were related to stakeholders that forego certification.

Alongside improvements to best practices and more intentional engagement with members, there is a clear need for innovative technology to be implemented across the damage prevention process.

In addressing the use of technology – one of CGA’s recommendations – it is useful to start with CGA’s own resources. In 2016, Congress required the Pipeline and Hazardous Materials Safety Administration (PHMSA) to conduct a study on improving damage prevention programs. In extensive consultation with the CGA Technology Committee and others, PHMSA reported back in 2017 the *Report to Congress on Improving Damage Prevention Technology*. In it, PHMSA highlighted technology for locating “unlocatable” plastic facilities, advances in mapping technology, and more. Most notably, PHMSA repeatedly highlighted one of CGA’s Best Practices, Enhanced Positive Response (EPR), as a technology-based technique **demonstrated to reduce damage by as much as 67 percent**. After four years, no state has updated its laws to incorporate the mandatory use of EPR or technology-based quality controls.

Taken together, the recommendations that CGA presents in the DIRT Report call for top-to-bottom systemic changes, adoption of structural and system reforms, and implementation of new and innovative technology. These changes have been needed for years. In order to reverse the trend in excavation damage, we commend CGA for its recommendations and hope to see them all put into action.

Next, we make two recommendations of our own. The first is a way that CGA and industry leaders can take action voluntarily. The second is for both state and federal policymakers to craft overarching rules and regulations.

**Our first recommendation is for industry participants.** Self-regulation is the preferred option by industry stakeholders, as it provides the most flexibility and cost effectiveness. We recommend a more proactive best practices approach, first by strengthening certain best practice descriptions (as recommended by CGA) and second, more importantly, creating a method to encourage the use of best practices, by creating a certification program to certify members’ implementation of best practices. If this program fails to improve best practice implementation or reduce damage, regulators may need to step in to establish new minimal enforceable standards for damage prevention practices.

**Our second recommendation is for policymakers.** We believe that some regulation is needed given the presence and extent of negative externalities, including damage, casualties, and economic harm. We recommend a technological threshold, that stakeholders must meet, requiring the use of certain available technologies during the locate and excavation phase. This technology threshold may be implemented by PHMSA through its state certification process at a general level and by individual state authorities with specificity. The federal rule may require use of GPS or photo sharing, while states may fully require EPR.

# Introduction

The opening line of the *Damage Information Reporting Tool, Volume 16 (2019)* (the “DIRT Report”) executive summary states “Damages are on the rise.”<sup>1</sup> We note and share the sense of gravity and, through this paper, present certain data from the DIRT Report while also proposing actions we believe to be both critically needed and likely to be effective at reducing excavation damages. Unlike our previous analyses, we commend CGA for presenting data more clearly and employing an improved statistical model.

The urgency to address excavation damage is made clear by an alarming five-year trend of increasing excavation damage incidents, with over half a million incidents occurring last year. The DIRT Report highlights that excavation damage is estimated to have cost the U.S. over \$30 billion in 2019 alone. We believe the high cost of excavation damage – in both dollars and human casualties – can be significantly mitigated with implementation of the recommendations made by CGA and the other recommendations discussed here, in particular the increased use of available technology to improve practices and enhance communication among industry participants.

Reform of best practices is something CGA presents in the DIRT Report as a tightening of the language of certain practice descriptions to provide greater specificity for stakeholders to follow. According to analysis presented in the Report, a number of damage root causes correlate to certain best practices which need greater specificity. We agree that these practice statements can and should be improved upon, but we believe this alone will be insufficient to combat rising damages.

We will also explore technology. In the DIRT Report, CGA recommends “adopt new technologies to help prevent damages.” Adoption of technology is important in damage prevention for two reasons: first by preventing losses, and second by actually improving efficiency. We look to both CGA and PHMSA for proven technologies. From CGA’s *Technology Advancements & Gaps in Underground Safety* report<sup>2</sup> (“Technology Report”) and PHMSA’s *Report to Congress on Improving Damage Prevention Technology*<sup>3</sup> (“PHMSA Technology Report”), we can see tools and techniques for everything from locating and excavating to information sharing. The use of innovative technology to facilitate information sharing is of great worth, because much of the damage prevention process involves collaboration, and where uncertainty exists, damage is more likely.

According to the CGA Technology Committee, and validated by PHMSA, the use of a technology called Enhanced Positive Response (EPR) has a demonstrated ability to reduce damages by as much as 67 percent.<sup>4</sup> Additionally, users report that EPR led to improved job site efficiency, and that additional

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<sup>1</sup> Common Ground Alliance. *Damage Information Reporting Tool, Volume 16*. (October, 2020). at p. 2.

<sup>2</sup> Common Ground Alliance. *Technology Reports*. (2020, May 26). Retrieved from <https://commongroundalliance.com/Publications-Media/Technology-Reports>.

<sup>3</sup> United States, Department of Transportation, Pipeline and Hazardous Material Safety Administration. *A Study on Improving Damage Prevention Technology*. (2017). Retrieved from <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/news/18351/reporttocongressonimprovingdamagepreventiontechnologyaug2017.pdf>.

<sup>4</sup> *Id.* at p.22.

enhanced information provided by the implementation of EPR added value.<sup>5</sup> When faced with five years of rising damage, turning to a technique proven to significantly reduce damage is the natural first step.

Now that CGA is recommending systemic shifts, it is time to seriously engage with how best to bring it about. The three approaches for changes as we see them are (1) voluntarily raised standards by CGA and One-Call centers that *are implemented and adopted by industry participants*; (2) the federal government setting a minimal standard across the country for the use of technology; or (3) states updating their laws to incorporate and require technology and certain vital best practices in the damage prevention process.

In summary, no one approach is likely to succeed on its own:

- (1) **Voluntary action alone may not be adequate.** The five-year trend of rising, costly damage demonstrates that despite technological advancements and voluntary improvements, the industry has not sufficiently regulated itself to reduce or prevent excavation damage.
- (2) **The federal government has not yet taken action to set a minimum enforceable standard.** If meaningful changes are not or cannot be made voluntarily or through the several states, the federal government may need to set certain threshold rules like use of key best practices, implementation of innovative technologies, or broader reporting requirements.
- (3) **The states have not demonstrated the ability to respond quickly and improve their damage prevention laws effectively.** The five-year rise in excavation damage has spanned the entire country, and even among states that have updated their laws and regulation in the last five years, only a few required more and better technology or strengthened critically required practices.<sup>6</sup>

The needed approach likely involves all three levels to succeed in meaningfully reducing damage. Industry leaders must take new steps to improve the specificity of best practices and be more active in advocating for stakeholders to implement best practices and innovative technology, possibly through a certification program. A federal rule requiring adoption of GPS data, mapping, electronic positive response, quality control measures, and shareability among all parties would enhance communication among participants greatly. That broad rule can serve as a technology threshold for PHMSA certification for grant eligibility. States would then be able to craft rules with specificity, and detail how and what information is to be shared.

The exact approach must be guided by the data and informed by the facts on the ground.

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<sup>5</sup> Smith, T. *Introduction of Enhanced Positive Response*. (2017, May 17). Retrieved from [https://www.epa.gov/sites/production/files/2017-05/documents/introduction\\_epr.pdf](https://www.epa.gov/sites/production/files/2017-05/documents/introduction_epr.pdf).

<sup>6</sup> Aii. *2020 Damage Prevention Report Card*. (October, 2020). <https://www.aii.org/wp-content/uploads/2020/10/Aii-2020-Damage-Prevention-Report-Card.pdf>.

# Analysis of 2019 Excavation Damage

The latest DIRT Report analyzed a record high number of reported damages in 2019. After adjusting for redundancy, CGA finds that 2019 had the highest number of unique damage incidents reported.<sup>7, 8</sup> Based on the reported incidents and applying a statistical model, CGA estimates **the total number of damage incidents for 2019 to be 532,000.**<sup>9</sup> That is up 4.5 percent from the 509,000 incidents estimated for 2018.

The increase in total estimated damages of 4.5 percent also aligns with an estimated 4.5 percent increase in damage per million dollars of construction spending last year.<sup>10</sup> Construction spending, however, was virtually flat. This reflects a clear problem with the current system, because constant-level construction spending still leads to higher damage. It also indicates that when construction spending does increase, if serious reforms are not implemented, we are in for ever-higher damages.

Identifying increases in estimated damages with faster rate of growth in the economy<sup>11</sup> reflects a failed system. We must have a damage prevention process that is resilient to a healthy economy. Otherwise, it would take a recession to experience fewer damages. The damage prevention process, if followed, should prevent *any and all* damage regardless of the level of construction spending or activity.

CGA points to higher transmissions levels relative to flat construction spending as strain on the system. This is certainly possible, although would only explain the rising *rate* of damage in 2019 and not the already high damage level and five-year trend. That can only be explained by lack of adherence to the process by stakeholders at multiple levels, including low usage of best practices.

## Huge Costs of Damage

New to this year's DIRT Report is an estimate of the total societal costs from excavation damage. While in 2016, a low-end direct cost estimate was included in the Report, this year's DIRT Report includes an estimate encompassing both direct and indirect costs. The finding is that **excavation damage cost the U.S. approximately \$30 billion in 2019.**<sup>12</sup>



<sup>7</sup> *Supra* note 1 at p. 2.

<sup>8</sup> Reporting to DIRT is voluntary, which leads to some damages being reported multiple times and some not being reported at all. CGA scrutinizes each reported damage and runs a statistical model to estimate the total damages across the country, both adjusting for redundancy and accounting for the unreported damages.

<sup>9</sup> *Supra* note 1 at p. 2, 9.

<sup>10</sup> *Id.*

<sup>11</sup> *Supra* note 1 at p. 10.

<sup>12</sup> *Supra* note 1 at p. 2, 11, 50-57.

This cost estimate, completed by Green Analytics, showed that the true cost could be up to \$60 billion.<sup>13</sup> This is consistent with other estimates that the U.S. experiences around \$50 billion or more in economic harm from damage to underground facilities.<sup>14</sup>

The inclusion of economic costs in the latest DIRT Report indicates the sense of seriousness about the upward multi-year trend of excavation damages. By including the significant cost of damages in its report, CGA makes clear that high excavation damage incident numbers alone do not seem to be enough to shake industry or government into taking more action.

The estimated \$30 billion in damage costs not only accounts for facility repair costs, lost product, and related expenses, but also injury and death, service interruptions to customers, reputational harm, business delays, and traffic delays, which are all negative externalities thrust upon people both inside and outside the scope of the excavation process.<sup>15</sup>

As industry professionals and policymakers grapple with the enormity of costs and consider how to reverse the trend by implementing reforms to improve the damage prevention process, they should consider the detailed information regarding root causes set forth in the DIRT Report.

## Root Causes

The DIRT Report presents the errors and omissions that led to excavation damage as one of 26 root causes (including Root Cause Not Listed) as reported to the DIRT platform. When making damage reports, stakeholders are able to provide information such as whether an intent-to-dig notification was made, whether the locator mismarked the site, or if the excavator dug outside the legal timeframe or marked boundaries. CGA has grouped these root causes (excluding incidents reported as “Unknown” or “Not Listed”) into four categories: excavation practice, invalid use of request, locating practice, and no locate request.

The most numerous root cause identified was that no locate request was made. It is so significant, in fact, that when the root causes are grouped into categories, No Locate Request stands by itself as its own group.<sup>16</sup>

### **The root cause of damages categorized as “Notification Not Made” has increased for a third year.<sup>17</sup>**

In the graphic below, tracking the teal color representing “No Locate Request” reveals that damage explained by Notification Not Made has risen each year from 16 percent in 2016 to 29 percent last year.

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<sup>13</sup> *Id.*

<sup>14</sup> Zeiss, G. *Reducing Damage to Underground Utility Infrastructure during Excavation: Costs, benefits, technical advances, case studies, and recommendations.* (2020, April 16). Retrieved from <https://energycentral.com/c/pip/reducing-damage-underground-utility-infrastructure-during-excavation-costs>.

<sup>15</sup> *Supra* note 1 at p. 50-57.

<sup>16</sup> No Locate Request and Notification Not Made represent the same failure to call 811 or otherwise notify a One-Call center in accordance with state law.

<sup>17</sup> *Supra* note 1 at p. 16.



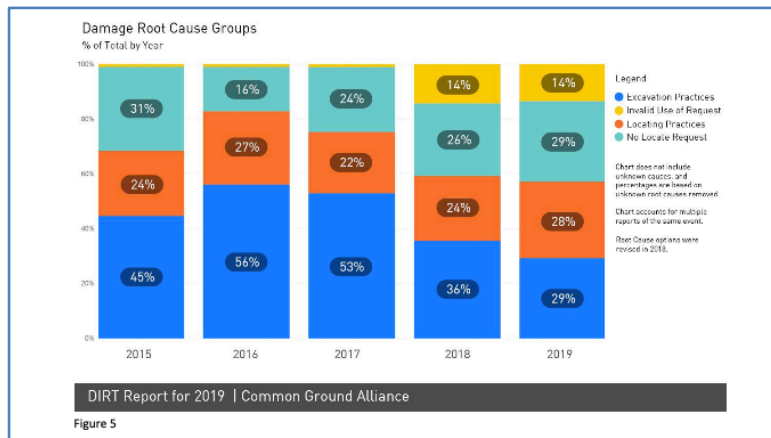


Figure 5 from DIRT Report (p. 14).<sup>18</sup>

The damage incidents explained by no notification are increasing despite 811 awareness reaching an all-time high.<sup>19</sup> Although significant effort has been made to increase awareness of calling 811, the approach to awareness *and* motivating use of 811 may need a new tactic. We are either seeing in the data that awareness campaigns are not very effective at motivating use of 811, or we have reached a plateau on the effectiveness of the current approach.

The grouped root causes by category show that reversing the trend in excavation damage is not as simple as fixing one issue, and that the activities of all stakeholder groups (i.e., excavators, locators, One-Call centers, and operators) need to be addressed. Importantly, we believe technology is useful and needed to address practices across multiple groupings. While individual root causes like “unlocatable facilities” may be reduced by a directly related locate technology, excavators and locators can both benefit from innovative technologies that facilitate better communication about the proposed dig, site markings, and presence of facilities. Enabling each party to access a common platform for those details would improve clarity and efficiency while reducing errors that lead to damage.

According to CGA, a number of singular root causes correlate to certain best practices which lack specificity. Those root cause errors may be mitigated through reforms to the Best Practice Guide and new training efforts. Not all root causes can be addressed simply through improved practice statements, but other root-cause-derived reforms may help drive down damage. Of course, improved best practices are only helpful if they are implemented.

With an overview of 2019 data in mind, the next task is to look at what solutions are being proposed. We turn now to the recommendations CGA provides.

Reported Damages by Root Cause for 2019  
Coded by Root Cause Group

Root Cause	Reports	% of Total
No notification made to one call center / 811	100,163	29.10%
Excavator failed to maintain clearance after verifying marks	57,484	16.70%
Facility marked inaccurately due to locator error	36,397	10.57%
Excavator dug before valid start date/time	33,665	9.78%
Facility marked inaccurately due to abandoned facility	25,090	7.29%
Improper excavation practice not listed elsewhere	17,108	4.97%
Excavator failed to shore excavation/support facilities	13,411	3.90%
Facility not marked due to locator error	12,256	3.56%
Facility marked inaccurately due to incorrect facility record/map	7,446	2.16%
Excavator dug prior to verifying marks by test-hole (pothole)	6,661	1.94%
Excavator dug after valid ticket expired	6,588	1.91%
Excavator dug outside area described on ticket	5,182	1.51%
Marks faded, lost or not maintained	5,131	1.49%
Facility not marked do to unlocatable facility	4,941	1.44%
Facility not marked due to no response from operator/contract locator	4,362	1.27%
Facility not marked due to incorrect facility record/map	2,556	0.74%
Site marked but incomplete at damage location	1,402	0.41%
Deteriorated Facility	1,246	0.36%
Excavator provided incorrect notification information	855	0.25%
One call center error	590	0.17%
Facility not marked due to abandoned facility	498	0.14%
Facility marked inaccurately due to tracer wire	465	0.14%
Previous Damage	367	0.11%
Facility not marked due to tracer wire issue	223	0.06%
Improper backfilling	140	0.04%

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Table 4— Reported damages by root cause for 2019 (color coded by root cause group) The Data Committee sorts these 26 individual root causes into 6 groups to provide a high-level snapshot of what went wrong in the damage prevention process.

<sup>18</sup> Certain individual root causes were reassigned to other groupings, and certain unknown and miscellaneous causes are omitted. The sharp rise in Invalid Use of Request beginning in 2018 is the result of shifting groupings.

<sup>19</sup> *Supra* note 1 at p. 16.

## Discussion of CGA Recommendations

The DIRT Report leads off with a set of recommendations taking aim at the entire damage prevention process, recognizing that addressing a single root cause or practice will not reverse the upward trend in damages. The Report includes nine recommendations, with the first five relating to issues that emerged as part of CGA's root cause groupings analysis and the last four that are based on DIRT Report data.<sup>20</sup>

The nine CGA Data Reporting and Evaluation Committee recommendations are:

- (1) Address potholing and excavating in the tolerance zone;
- (2) Examine pressures on locators;
- (3) Emphasize the proper use of locate requests;
- (4) Develop strategies for addressing persistent no-call damages;
- (5) Explore *all* opportunities for improvements to the damage prevention process – both modifications to individual stakeholder performance, enhancements to the current system as well as potential structural changes and innovative solutions to address persistent challenges;
- (6) Increase the quantity and quality of DIRT submissions;
- (7) Use the new Interactive Dashboard to explore damage data;<sup>21</sup>
- (8) Read the Case Studies from North Carolina 811 and National Grid;<sup>22</sup> and
- (9) Adopt new technologies to help prevent damage.

These recommendations are directed to damage prevention stakeholders, including excavators, locators, One-Call centers, and utility operators. They also offer potential for regulators and lawmakers to take action based on the areas addressed by the recommendations, especially considering the all-encompassing systemic changes needed. Special emphasis is added to recommendation five, where CGA calls on *all* (their emphasis) opportunities for change, wherever they are found. In addition, we note that in particular, recommendations two, four and nine may also be ripe for policymaker input on the state or even federal level, which may take the form of basic threshold requirements alongside industry-led voluntary programs.

In assessing some of the solutions proposed by CGA, we start with the broadest, recommendation five, and in particular explore weaknesses in best practices as discussed in the DIRT Report. Next, we discuss recommendation nine, adoption of new technology. Finally, we explore recommendations two, four, and six, which relate to pressure on locators, One-Call awareness, and data quality.

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<sup>20</sup> *Supra* note 1 at p. 3.

<sup>21</sup> “Reported damages from 2019 and 2018 are displayed via a new PowerBI dashboard that makes it easier than ever to drill down into DIRT data that is most applicable or actionable for your organization.”

<sup>22</sup> These outline the use of artificial intelligence and other technology to reduce damage.

## Best Practices

Under the umbrella of recommendation five, and assessed elsewhere in the DIRT Report, CGA points to the need to improve and refine certain best practices. They note that “the low-hanging fruit has been harvested” and it is now time to “coalesce around the more difficult issues.”<sup>23</sup> The implication is that the low-hanging fruit are the existing best practices promulgated by CGA with the uncontroversial and unanimous agreement from stakeholders. To become a best practice, CGA requires 16 stakeholder groups to agree. Part of the problem with current best practices is that, as noted by CGA, they lack specificity, perhaps due to weak language from compromising among the various stakeholder groups.

We would add that even with more specificity, the more pressing issue is a low implementation and use of the various best practices except where they are also required by state law.<sup>24, 25</sup> A definitive guide on the most effective technologies and techniques certainly adds value to those who choose to implement them, but more should be done to get best practices into use, particularly as the best practices are improved as recommended by CGA.

One example to explore is CGA Best Practice 5.8: Positive Response, which CGA believes implies passive excavator behavior. CGA recommends reframing to make the excavator’s responsibility clearer. The current practice statement is:

The underground facility owner/operator either 1) identifies for the excavator the facility’s tolerance zone at the work site by marking, flagging, or other acceptable methods; or 2) notifies the excavator that no conflict situation exists. This takes place after the one call center notifies the underground facility owner/operator of the planned excavation and within the time specified by the state/provincial law.

While CGA admirably recommends leading this statement off with “The excavator waits until the facility owner/operator...” to clarify that the excavator also has a responsibility, we believe that change does not go far enough. It allows the marking itself to be sufficient *positive response* and fails to close the communications loop, leaving open the possibility that the owner/operator/locator does not arrive, cannot fully access the site, leaves incomplete markings, or otherwise fails to fully mark the site.

The “positive response” best practice should describe the owner/operator making a clear follow-up communication regardless of whether facilities are present on site. This would close the communications loop, as well as reaffirm that the excavator must wait until all marking is complete. Under the current practice, the owner/operator is only expected to call or communicate if they do not have facilities. But an excavator could wait the statutory period and receive no communication, see prior, partially, or unmarked site, and begin work even though the site has not been fully located. We recommend strengthening positive response to include the follow-up communication for every notice.

<sup>23</sup> *Supra* note 1 at p. 25.

<sup>24</sup> CGA has described an intention to “advocat[e] for widespread implementation of existing CGA Best Practices.” Common Ground Alliance. *Insights into Improving the Delivery of Accurate, On-Time Locate*. (October, 2020). Retrieved from <https://commongroundalliance.com/Portals/0/Library/2020/White%20Papers/CGA%20Locator%20White%20Paper%20-%20FINAL%2010.21.20.pdf?ver=2020-10-22-131342-877>.

<sup>25</sup> Evidence of limited best practice use can be found in the new DIRT questions (*Supra* note 1 at p. 32-33). CGA best practices like white lining were not used on over 25,000 jobs where damage occurred.

Our suggestion would be: “**The excavator waits until the facility owner/operator** 1) identifies for the excavator the facility’s tolerance zone at the work site by marking, flagging, or other acceptable methods *and notifies the excavator that such marking is complete*; or 2) notifies the excavator that no conflict situation exists. This takes place after the one call center notifies the underground facility owner/operator of the planned excavation and within the time specified by the state/provincial law. *Follow up notice to the excavator, directly or through the One-Call center, is done through an electronic positive response system.*”

This change would improve communication and clarify any misunderstanding about the presence or lack of markings and facilities on the site. It would also improve efficiency by allowing excavators to know the status of their locate request in real-time before rolling out to a site.

We believe this would greatly improve the practice statement and directly address the “WAIT/CONFIRM” problem loosely addressed with Best Practices 5.8, 5.9, and 5.10.<sup>26</sup> Additional language to encourage electronic positive response also helps close the loop of communication and provides direction to both the locator or operator and excavator to update and view the ticket status.

Best Practice 5.10 could be greatly improved with a reference to electronic positive response, but more effective may be a reference to enhanced positive response (EPR). Allowing all parties to access a common platform with enhanced information including site marking photos, maps, and manifests would make locate verification more practical and effective.



Strengthening and specifying best practices is only part of the solution to rising excavation damages. When CGA recommended exploring “*all opportunities for improvements to the damage prevention process*”, they made clear that these useful, and valuable changes to best practices are not enough. An initiative to incentivize practice use and certify members’ implementation of best practices is the next natural opportunity for improvement.

A best practice certification program could improve stakeholder engagement and promote safety. This would offer every stakeholder, from individual proprietors to large companies, a chance to put best practices into action, demonstrate their proficiency, and earn recognition as a safety-oriented practitioner. The hope would be that customers would gravitate to providers that have been certified as to using the best practices.

<sup>26</sup> *Supra* note 1 at p. 25-26.

Certification programs could be devised for each stakeholder group: excavators, locators, One-Call centers, and utility operators. A certification program may help to bring best practices off the page and into practice for more stakeholders, which would improve the whole damage prevention ecosystem. This approach continues to leave best practices voluntary rather than regulated, and offers CGA potential for new data collection to compare against damages. The Next Practices Initiative<sup>27</sup> seems well suited to take on this type of program.

## **Technology**

Holding last place in CGA's list of recommendations, but perhaps most important, is a recommendation for the adoption of new technology to prevent damages. Unlike many of the other recommendations, inexplicably this one is not given further discussion in the DIRT Report. Many technologies exist today – and are in use – that have proven track records for decreasing damage while promoting safety and efficiency, and even adding value. It is discouraging that after numerous pilot programs, studies by PHMSA, and more, some existing technologies do not get mentioned in the DIRT Report.

The go-to resource on technology is the CGA Technology Committee, which studies and promotes the latest technological advancements in the damage prevention industry. When Congress called on PHMSA in 2016 to study improving technology for damage prevention, PHMSA turned to the CGA Technology Committee. The Committee shared with PHMSA information from members on the latest techniques and technologies emerging or in use. The resulting PHMSA Technology Report back to Congress cited a host of available practices and procedures employing a range of technologies.<sup>28</sup>

From techniques for locating “un-locatable” plastic pipe to trenchless excavation and improved GPS technology, the report discusses a wealth of innovative technologies. Some of the technologies identified by PHMSA are already in use and available to stakeholders today, yet they are underutilized. Some of the noted technologies are even outlined in the CGA Best Practice Guide. There seems to be something lacking in the promotion of best practices after inclusion in the Guide. Once there, it is left up to individual stakeholders to adopt them. A more hands-on approach to promoting the use of best practices is needed, even beyond promoting the language and description of what the best practices are.

To be recognized as a best practice, the technique or technology must be in use in the field and demonstrated by a stakeholder to the Best Practice Committee. This means the practice is not an idea, experimental product, or emerging practice, but a well-established and proven technique. It is a wonder, then, that many technologies showcased in the PHMSA Technology Report, cited by the CGA Technology Committee, and included in the Best Practice Guide nevertheless fail to get a mention in the fifth consecutive DIRT Report showing rising excavation damage. Inclusion of an effective practice or technology in the Best Practice Guide cannot be the end of its promotion. When proven to reduce damage, we should expect to see them promoted in every possible forum.

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<sup>27</sup> Common Ground Alliance. *Next Practices Initiative*. (2019, November 30). Retrieved from <https://commongroundalliance.com/next-practices-initiative>.

<sup>28</sup> *Supra* note 3.

The most striking case is Enhanced Positive Response (EPR), which according to CGA and validated by PHMSA, has a proven ability to reduce damage by as much as 67 percent.<sup>29</sup> With all attention turning to systemic change, floor to ceiling review, and a need to address every step in the damage prevention process, CGA left new technological adoption last in its recommendations, with no follow up in the Report, and zero mentions of a best practice known for **two-thirds reduction in damage**.

EPR gets referenced in each of the last three annual CGA Technology Reports.<sup>30, 31, 32</sup> In 2018 and 2019, EPR was listed among a list of “gaps” or “wish list of technology innovations” to hopefully be made into best practices one day, as well as listed in “currently in use.” In 2020, EPR is simply listed as “current technology in use.” This is a bit curious given that EPR was designated as a Best Practice by CGA in 2017, three years after an initially successful pilot program in 2014. Despite being listed in that report and the Best Practice Guide, it is a highly effective practice that seems to be underutilized.

We encourage CGA to take a close look at the PHMSA report and consider how best to encourage member implementation of the various technologies, including EPR. We believe this must include an active program like certifying stakeholders willing to demonstrate their adoption of new and available technology. In addition, CGA should look for ways to further educate stakeholders and even policymakers regarding technology and how they can impact the damage prevention process.

### **Pressure on Locators**

CGA’s second recommendation centers on the volume of locate requests and the workload of locators. The DIRT Report analyzes possible strain on the system by exploring the relationship between the number of transmissions per dollar of construction spending, noting an increase in the number of locate requests per dollar of construction spent.

Construction spending is a proxy for how much groundbreaking occurs in a given year with the potential to threaten underground utilities. Because the number of transmissions rose in 2019 relative to the dollars of construction spending, it appears that more locate requests were being called in than the level of construction spending would predict. Given that this increase coincided with more damages, the DIRT Report indicates that this increase may be straining the locator industry.

CGA points to the root cause of mis-marks due to locator error as an indication that some locators are unable to accurately facilitate the high volume of ticket requests. The high volume could be viewed positively, owing to greater knowledge of 811, better compliance with notification laws, or increased

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<sup>29</sup> *Id.*

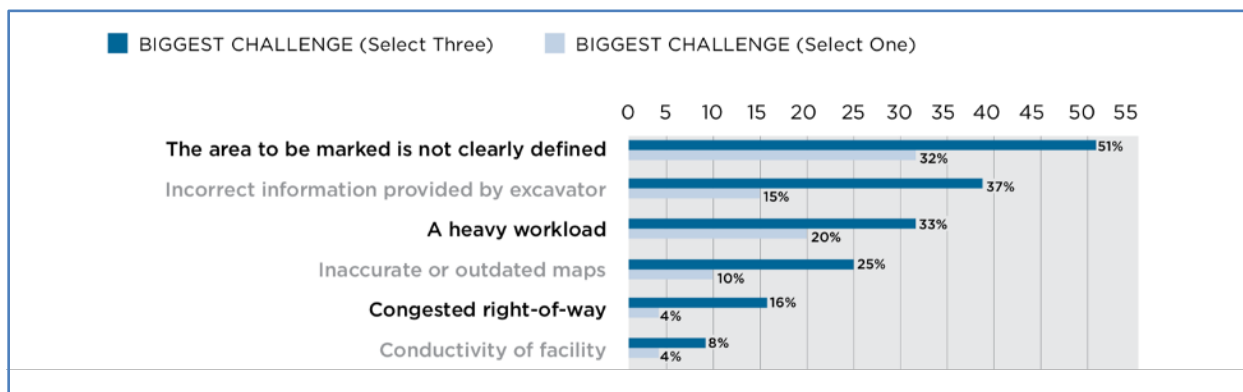
<sup>30</sup> Common Ground Alliance. *Technology Advancements & Gaps in Underground Safety*. (May, 2020). Retrieved from [http://w.commongroundalliance.com/sites/default/files/publications/Technology%20Report%202020\\_Final\\_05.18.2020.pdf](http://w.commongroundalliance.com/sites/default/files/publications/Technology%20Report%202020_Final_05.18.2020.pdf)

<sup>31</sup> Common Ground Alliance. *Technology Advancements & Gaps in Underground Safety*. (June, 2019). Retrieved from [http://dev.commongroundalliance.com/sites/default/files/publications/2019%20Technology%20Report\\_Final\\_0.pdf](http://dev.commongroundalliance.com/sites/default/files/publications/2019%20Technology%20Report_Final_0.pdf)

<sup>32</sup> Common Ground Alliance. *Technology Advancements & Gaps in Underground Safety*. (March, 2018). Retrieved from [https://commongroundalliance.com/sites/default/files/publications/Annual%20Technology%20Report%2017\\_02.27.18\\_FINAL.pdf](https://commongroundalliance.com/sites/default/files/publications/Annual%20Technology%20Report%2017_02.27.18_FINAL.pdf)

membership of utilities in One-Call centers. It could also be, as the DIRT Report points out, “periodic unanticipated surges” in transmissions inhibiting locators’ ability to complete their locates in an accurate and timely manner.<sup>33</sup> Exploring the scheduling of tickets, then, may be one area of reform to mitigate surges and may be ripe for state regulatory action. White lining may also be useful in better defining the excavation area and limiting the potential for mis-marking or other locating errors.<sup>34</sup>

Data from the 2019 CGA Utility Locators Online Survey<sup>35</sup> indicates that focusing on excavator education may be the best way to improve locator accuracy – including how to make proper locate requests, how many requests to make, and when marks expire/new requests are needed. Seen below, locators believe the biggest challenges to their timely and accurate marking center on unclear proposed excavation sites, incorrect site information, and heavy workloads.<sup>36</sup> These may lead to strain by making locate jobs inefficient, inaccurate, or incomplete because more information is needed. Both physical and virtual white lining may be useful, along with improved best practices and regulation for what, when, and how excavators call in locate requests. Undefined excavation sites, incorrect information, and heavy workload are all indicative of broad or unnecessary locate requests, which strain resources.



Some strain may also be attributed to excavators calling in tickets for parts of a project they will not be able to get to before the ticket expires. For example, calling in locate requests for a one-mile stretch of road, but only being able to work on the first half mile of road before the locate marks statutorily expire. That means the locators worked for naught before and will have to revisit the site when the excavator gets to the other work areas. This is a burden on the system that does not need to be there. Moreover, it creates danger throughout the system, because excavators could rely on expired marks, locators could choose not to revisit a site they recently marked, locators could be stretched too thin to reach other sites, or other human error or judgment issue.

We believe this could be addressed through a new or revised best practice. However, if adoption or compliance with a best practice is not adequate, state-level regulation should be adopted.

<sup>33</sup> *Supra* note 1 at p. 11.

<sup>34</sup> White lining is the practice by the excavator of pre-marking the proposed excavation site to define the full area where the dig is to take place. This gives locators more information about the site and can make their task more efficient.

<sup>35</sup> *Supra* note 24.

<sup>36</sup> *Id.* at p. 5.

## No Locate Request

According to CGA, awareness for *Call Before You Dig* and the 811 national-call-in number are at an all-time high.<sup>37</sup> Despite this, the excavation damage explained by “Notification Not Made” before a dig increased for a third consecutive year.

It may be time to reexamine how awareness and education relating to 811 are handled. Even with an inverse relationship showing that higher awareness correlates to lower damage, the rise in Notification Not Made is concerning.

According to the 2018 DIRT Report, awareness is measured through a survey question asking, “*Are you aware of a free national phone number that people can call to have underground utility lines on their property marked prior to starting any digging project?*”<sup>38</sup>

There are two follow-up questions in the survey: an unaided (“Do you recall what the number is?”) and an aided (“Does the phone number ‘811’ sound familiar to you?”).<sup>39</sup> CGA reports that in 2020, these follow-ups resulted in about 43 percent familiarity for the aided and only 10 percent for the unaided.<sup>40</sup>

Missing from these questions is whether the survey taker knows that calling this number is required by law. It is easily conceivable that a person is loosely familiar with a logo or number but has no idea about the importance of it, the legal requirement, or its applicability to their life.

This survey reveals a possible problem with awareness. CGA expends vast resources to do general awareness of 811 such as on NASCAR wraps, crowded-text billboards, and horse races. These campaigns primarily promote 811 and its logo. Data shows an inverse relationship between awareness and damage, so we cannot say it is not effective. But we can also see damage incidents from Notification Not Made increasing, so there is at least a limit to the effectiveness of the current programs therefore calling for a new and perhaps more cost-effective strategy.

Moreover, it is still difficult to get to the bottom of Notification Not Made damage, because data is difficult to come by. CGA acknowledges – “Additional research into the no-call group could help better address this damage category.”<sup>41</sup> Clarity here, and better data are important to refining best practices, educational outreach, and regulatory approaches.



<sup>37</sup> Common Ground Alliance. *Initial Research Overview: Public Awareness of 811*. (September, 2020). Retrieved from <https://commongroundalliance.com/Initial-Research-Overview-Public-Awareness-of-811>.

<sup>38</sup> Common Ground Alliance. *Damage Information Reporting Tool, Volume 15*. at p. 40.

<sup>39</sup> *Id.* At 7.

<sup>40</sup> *Supra* note 37.

<sup>41</sup> *Supra* note 1 at p. 3.



## Data Quality

Data quality must continue to be a focus in future years. The quality of data submitted to DIRT has fallen in each of the last three years. This lack of data quality obfuscates the picture of what is actually happening on the ground and forces industry and policymakers to act only on a broad understanding of incident trends.

Data quality is measured by CGA using their Data Quality Index (DQI), a measure of the completeness of data submitted to DIRT. Based on a 100-point scale, DQI is affected by what information is submitted, or more importantly, what information is *not submitted* in the virtual fields for things like Root Cause, Type of Facility damaged, and others.

The average data quality last year fell to 59, a four-point loss since 2017. In fact, over 72 percent of entries have data quality below 60.<sup>42</sup> That's 384,231 entries scoring 60 or below in DQI due to missing potentially critical information.<sup>43</sup> CGA states that “[e]nhancements in the quality of DIRT submissions could substantially increase the strength of the DIRT Report and the resulting recommendations.” Yet there seems to be little attention paid to how to bring that better data quality to fruition. Recommendation six is focused on improving data quality but does not by present a meaningful roadmap.

Interestingly, only two percent of companies – some 11 entities – submit over 61 percent of the DIRT Report data.<sup>44</sup> The reports from those 11 companies have average DQI scores between 50 and 60. If these 11 companies, responsible for 327,959 reports alone, improved their data quality, the overall picture would improve dramatically. CGA may consider ways to improve the reporting quality by discretely offering or allocating educational resources to those entities, or at a minimum, engaging in a discussion with those entities to gain an understanding of the causes of the poor data and then come up with ways to address the issue. In other words, CGA must go to its members and identify the root cause of the data quality problem, then work with them to overcome roadblocks to higher data quality.

Ultimately, improving data quality is important, but not the end goal of damage prevention or industry stakeholders. The goal is to reduce or prevent damage in the first place. To the extent damage information data helps identify where to best focus efforts on damage avoidance, data quality is vital. However, we believe improvements to best practices and improved use and compliance with known proven technology will drive down damage far more meaningfully and quickly than if we wait to see better quality data from future damages only to make improvements on the margins of root causes yet another year from then. For this reason, we highlight the need for data quality last, and strongly reemphasize the known, proven, and obviously beneficial recommendations, technology, and best practices already on the table.

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<sup>42</sup> *Supra* note 1 at p. 5, 37-38.

<sup>43</sup> *Id.*

<sup>44</sup> *Id.*

# Conclusions

The DIRT Report remains one of the only tools for understanding damage incident trends, root causes, and the impact of best practices in the damage prevention sphere. Policymakers and industry leaders should look to the comprehensive data and analysis regularly, using it to make data-driven decisions. The latest DIRT Report paints a serious picture that all readers should note. It is not only a snapshot of excavation issues in 2019; it reveals a trend of rising damages, costing the U.S. tens of billions of dollars, and it is all happening despite high spending on awareness, years of Best Practice Guides, and slowly evolving state laws to address damage prevention.

The DIRT Report tells us that the estimated total 532,000 excavation damage incidents in 2019 cost the U.S. over \$30 billion. It also tells us that damage is rooted in inadequacies across all stakeholder groups.

This year, we commend the Common Ground Alliance for making key recommendations and hope to see CGA members, industry leaders, and policymakers take serious and deliberate action to enact the recommendations put forth in this year's DIRT Report. We hope to see regular reports on the progress of implementing these recommendations and analysis of their efficacy in the next annual DIRT Report and future white papers.

We provide two additional recommendations that we believe will help to reverse the trend in excavation damages and costs, while also promoting public safety. Based on the 2019 data included in the latest DIRT Report, we recommend that CGA, states, and the federal government consider the following:

**(1) Create a certification program for CGA members to receive certification that they are actually using best practices**

We recommend that CGA take more intentional action on best practices by creating a certification program or designating a third-party organization to certify members' implementation of best practices.

- The Best Practices Guides have been a great resource for those in the industry to see which practices have proven records of reducing damages. They give individual stakeholders the opportunity to learn from others and see practices they may implement themselves. It seems that in many cases, CGA primarily promotes best practices by including them in the Best Practice Guide and no further. This leaves many stakeholders without incentive to take up new practices.
- CGA has expressed recently the desire for “advocating for widespread implementation of existing CGA Best Practices”<sup>45</sup> and determining if “the Best Practice [is] widely implemented, enforced, and communicated”<sup>46</sup> and “where it has been implemented, has it been shown to be effective? Is there data to support the effectiveness?”<sup>47</sup>

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<sup>45</sup> *Supra* note 24.

<sup>46</sup> *Supra* note 27.

<sup>47</sup> *Id.*

- An effective way to advocate the use of a practice is to reward those stakeholders implementing them with recognition and certification. This would also allow CGA to track which and how many stakeholders are implementing and adhering to best practices by maintaining a certification database.
- We recommend that CGA seriously consider creating a best practice certification program, possibly through its Next Practices Initiative. This would require each member to submit documentation or provide demonstration that they are implementing various best practices. It would be voluntary – or CGA could offer cost saving benefits like decreased membership dues for those who are certified – but would otherwise be something individual member companies can showcase to clients.

**(2) Establish technological thresholds as a minimum enforceable standard nationwide, followed by state-level implementing regulation**

For a truly systemic shift to take place, as called for by CGA, regulatory changes will be needed alongside industry action. We recommend that PHMSA add a requirement for state certification and grant eligibility dependent on each state mandating the use of enhanced information sharing among all parties in the damage prevention process. This broad rule, which would encourage electronic sharing of photos, GPS data, virtual maps, and other information, would allow each state to specify the type and extent of information sharing.

- On a federal level, PHMSA should consider mandating the use of electronic information sharing among stakeholders in the damage prevention process.
- On a state level, we recommend that lawmakers and regulators look for ways to best comply and implement EPR or similar enhanced information sharing and quality control, as well as study ways to improve the use of best practices and incentivize technology through regulation.
- The federal or state rules may start by only requiring EPR for locate jobs involving natural gas and pressurized hazardous material. This can be expanded in time or taken up voluntarily by more operators.

The Alliance for Innovation and Infrastructure (Aii) is an independent, national, educational organization dedicated to identifying our nation's infrastructure needs, creating awareness of those needs, and finding solutions to critical public policy challenges.

Aii strives to promote proven, innovative technology and higher safety standards to achieve industry excellence nationwide.

Our goal is to create higher standards by promoting innovative technologies and safer outcomes for national infrastructure projects.

The Alliance consists of two non-profit organizations; the Public Institute for Facility Safety, 501(c)(3) education and research organizations, and the National Infrastructure Safety Foundation, a 501(c)(4) social welfare organization. Two all-volunteer boards govern the Alliance. These boards also work in conjunction with the Alliance's own volunteer Advisory Council.





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## About Aii

The Alliance for Innovation and Infrastructure (Aii) is an independent, national research and educational organization that explores the intersection of economics, law, and public policy in the areas of climate, damage prevention, energy, infrastructure, innovation, technology, and transportation.

The Alliance is a think tank consisting of two non-profits: the National Infrastructure Safety Foundation (NISF), a 501(c)(4) social welfare organization, and the Public Institute for Facility Safety (PIFS), a 501(c)(3) educational organization. Both non-profits are legally governed by volunteer boards of directors. These work in conjunction with the Alliance's own volunteer Advisory Council.