



CGA White Paper

2022

Natural Gas: Leading the Damage Prevention Industry

Dear CGA members,

CGA began publishing a series of White Papers in 2019 to provide our members with data-driven recommendations for improving outreach to key damage prevention stakeholder groups. To date, CGA has released White Papers for two critical stakeholder groups impacting the damage prevention process — excavators and locators. The White Papers combine data from CGA's DIRT Reports, focus groups and public awareness studies that address stakeholder awareness of, and perspectives on, damage prevention Best Practices.

CGA is pleased to release the next White Paper in the series, which features insights from a crucial stakeholder group in a unique position of influence within the damage prevention industry: **natural gas facility owners and operators**. Over the next several pages, we analyze our survey of 178 employees in the natural gas industry and in-depth interviews with 15 natural gas distribution decision-makers to **share key takeaways** from this important primary research and **provide strategic recommendations** for how these stakeholders can leverage internal programs to **address external challenges in damage prevention**.

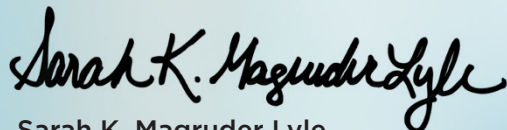
Because natural gas is a heavily regulated, high-consequence facility, this stakeholder group has rigorous requirements and is thus incentivized to invest in damage prevention awareness and training that other facility owners/operators may not have. Consequently, our research shows that there is a strong emphasis on safety and damage prevention among natural gas stakeholders that gives them an opportunity to leverage their influence with other groups to generate better damage prevention and safety outcomes.

Our research also points to areas where natural gas facility owners/operators can improve their efforts to further reduce damages. More widespread adoption of damage prevention technologies, greater focus on facility mapping and collaboration, and contracts that emphasize the importance of damage prevention have been highlighted by [CGA's Next Practices Initiative](#) as opportunities for systemic improvements, and the need for these changes is echoed in CGA's natural gas distribution owners/operators research.

There is no question that damage prevention is a shared responsibility, so I encourage you to share the insights from this CGA White Paper with colleagues in your organization, working groups, Regional Partnerships, one call board, Damage Prevention Councils and others in your network who are dedicated to preventing damages to underground facilities. Please feel free to contact me or any members of the CGA staff with questions you may have about this report.

Lastly, I would like to extend my sincere thanks to CGA's gas distribution facility owners/operators for their enthusiastic participation in this research, and their continued commitment to damage prevention.

Sincerely,



Sarah K. Magruder Lyle

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INTRODUCTION

NATURAL GAS DISTRIBUTION'S PERSPECTIVE ON THE STATE OF THE INDUSTRY

Each year, hundreds of thousands of damages to critical underground utilities occur, generating an estimated \$30 billion in societal costs according to CGA's [Damage Information Reporting Tool \(DIRT\) Report](#). DIRT data also tells us that **stakeholders across every step of the damage prevention process can make a significant impact** in reducing the persistent rate of national damages by addressing a handful of continued challenges.

With this in mind, in 2020, CGA launched the [Next Practices Initiative](#), which identified inefficiencies in the U.S. damage prevention system as well as the opportunities for systemic improvement that would result in the greatest potential return on investment for the industry. CGA's DIRT and Next Practices documentation demonstrates that each stakeholder group has a responsibility to help make the damage prevention process more efficient and effective — and insights from our new natural gas distribution stakeholder research shed light on the **particular strengths and challenges this sector of the industry faces in creating a more reliable damage prevention system**.

100% of the natural gas distribution employees surveyed for this White Paper reported that damage

prevention is important to their organization, with 95% calling it “very important” (SOURCE: Survey, slide 7). As the owners of some of the most-damaged and highest-consequence underground facilities, natural gas stakeholders are often the public face of damage prevention in ways positive and negative. It follows that this **stakeholder group is under significant pressure to protect its facilities and uphold its shared responsibility in the damage prevention process**.

In this White Paper, CGA analyzes its primary research of natural gas owners and operators to provide insight into the ways this stakeholder group can leverage its expertise to contribute to systemic improvements in U.S. damage prevention. The goal of the key takeaways detailed in the following pages is to help natural gas owners/operators, as well as the entire damage prevention industry, **better understand the steps they can take to improve damage prevention efficiency and drive down damages**.

We would like to thank our natural gas distribution partners for their collaboration on this important research, their unique perspectives on the challenges and opportunities present in the industry and their continued commitment to damage prevention.

CGA'S NATURAL GAS INDUSTRY RESEARCH METHODOLOGY

CGA's analysis includes both quantitative (survey) and qualitative (one-on-one interviews) studies with natural gas stakeholders.

SURVEY: 178 U.S.-based employees in the natural gas industry completed an online survey designed to measure their awareness of safe digging practices, their views around damage prevention and the challenges in the industry that they believe contribute to damages.

Participants: Natural gas industry analysts, managers, directors and others operating in damage prevention, safety, operations and other departments.

ONE-ON-ONE INTERVIEWS: Fifteen decision-makers from natural gas distribution companies participated in interviews to understand the factors that contribute to their organizations' decisions around damage prevention, perceived causes of damages to facilities and their general awareness of 811.

Participants: Managers and C-level executives at natural gas distribution companies.

KEY TAKEAWAY #1

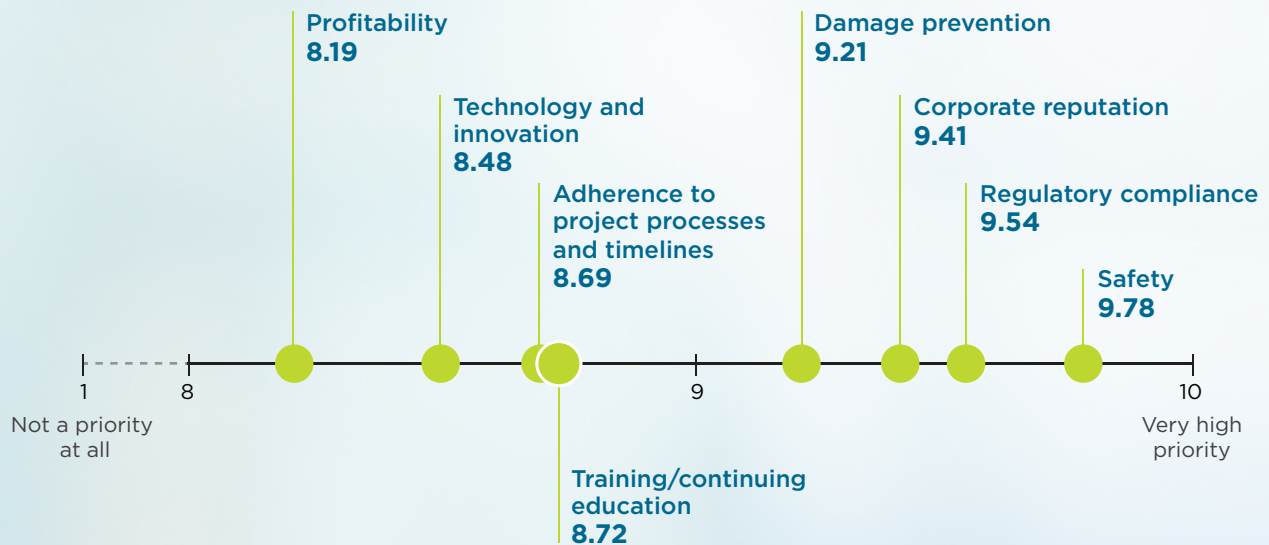
Natural gas distribution stakeholders are deeply engaged in damage prevention and can expand what they perceive as their central role in the industry.

It's clear from CGA's primary research among natural gas stakeholders that damage prevention is a top priority and is viewed as a key part of employee and public safety within their organizations. As a highly regulated sector within the underground utility space, the natural gas industry's significant incentive to invest in safety also gives natural gas distribution stakeholders a **unique opportunity to share their expertise in a way that could help improve the U.S. damage prevention system as a whole.**

Due to the high-consequence nature of their assets, natural gas distribution stakeholders place enormous weight on safety, with survey respondents having rated it as their organization's top priority. Damage prevention itself is top-of-mind in the gas distribution space as well: **99% of survey respondents reported that damage prevention is important at their organization and 94% view damage prevention as part of their organization's overall safety strategy** (SOURCE: Survey, slides 6-8).

FIGURE 1 | ORGANIZATIONAL PRIORITIES

Q | Using the scale below, with 1 being “not a priority at all” and 10 being “very high priority”, please indicate the priority you believe is placed on each of the following by your company or organization.



Base: Total Sample, n=178

Note: The chart scale is zoomed in for greater visibility.

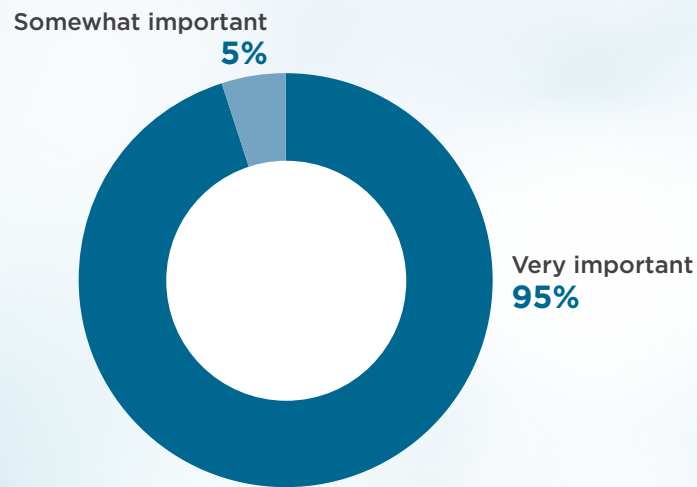
SOURCE: Survey, slide 6

KEY TAKEAWAY #1

CONTINUED

FIGURE 2 | IMPORTANCE OF DAMAGE PREVENTION

Q | How important is damage prevention in the natural gas industry?



SOURCE: Survey, slide 7

While most survey respondents (52%) believe that damage prevention is a shared responsibility among all stakeholder groups, **more than a quarter of natural gas distribution stakeholders (26%) view facility owners/operators — in other words, themselves — as the group primarily responsible for damage prevention.** This opinion was echoed in interviews with natural gas leaders and managers: Almost half of participants believed the responsibility for damage prevention in the natural gas industry should be shared among stakeholders, while one-third said facility owners/operators hold the most responsibility (SOURCE: Survey, slide 16; Qualitative research report, page 29).

FIGURE 3 | SELECTED RESPONSES FROM INTERVIEWS

“I think we carry the burden. I would say we are by far the one utility operator that is most involved in promoting damage prevention.”

– C-level executive

“[The natural gas industry] is the leader in advancing damage prevention because it has the most to lose by not promoting damage prevention.”

– Manager

“I think we lead the industry, personally.”

– Manager

“We have the most to lose if something goes wrong.”

– C-level executive

SOURCE: Qualitative research report, page 30

KEY TAKEAWAY #1

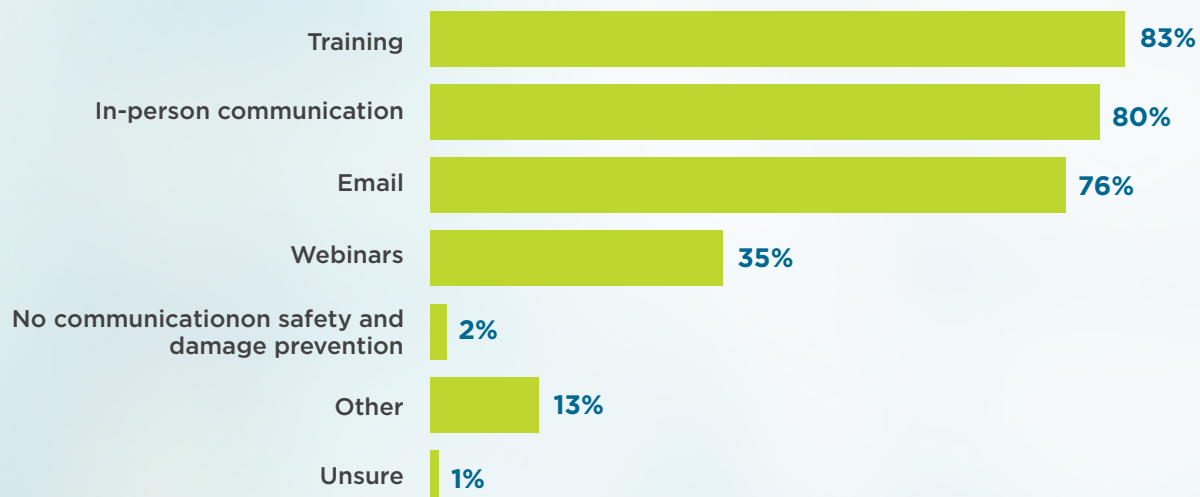
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The culture of safety within natural gas distribution organizations appears to be created through strong leadership and by weaving damage prevention into the fabric of organizational life. Natural gas distribution employees and leaders report that damage prevention is communicated from the top down within their organizations at multiple touchpoints, via trainings, in-person meetings, emails and webinars (SOURCE: Survey, slide 17; Qualitative research report, page 11).

This prioritization of safety extends beyond natural gas distribution stakeholders' own organizations to other industry groups, and puts them in an advantageous position to reach other stakeholders who have a role in protecting vital assets. Natural gas distribution organizations invest in both reactive and proactive excavator training and awareness initiatives to address excavation issues, which 48% of survey respondents believe to be the leading cause of damages to their facilities. Most individuals interviewed believe facility owners should be responsible for training excavators, and offer trainings in-house or partner with 811 centers or other organizations to offer training (SOURCE: Survey, slide 11; Qualitative research report, pages 33-34).

FIGURE 4 | COMMUNICATING ABOUT DAMAGE PREVENTION

Q | How does your organization communicate about safety and damage prevention?



SOURCE: Survey, slide 17

Several internal programs, communications and trainings flow from the compliance-driven, leadership-backed focus on damage prevention that is prevalent at natural gas distribution companies. The strong sense of damage prevention responsibility that natural gas stakeholders report has translated into true industry leadership and innovation.

KEY TAKEAWAY #2

Shifting the focus to internal processes and programs is more likely to drive immediate industry-wide improvements.

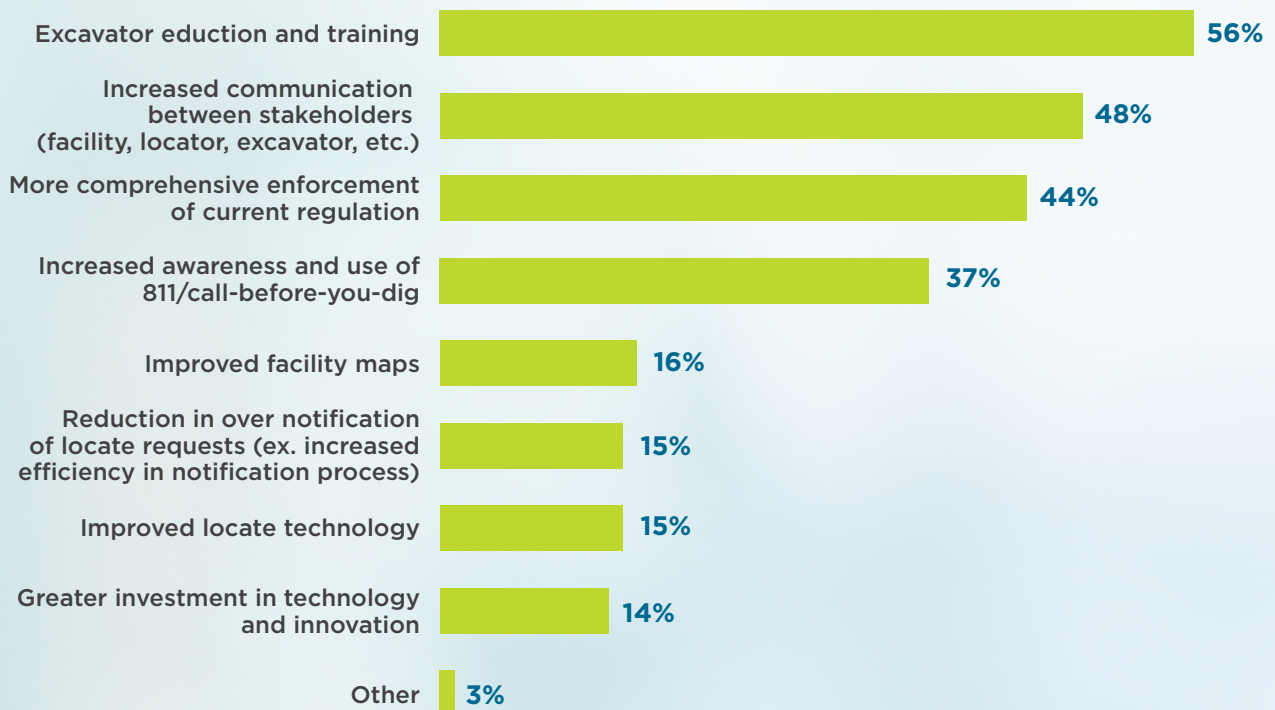
Facility owners/operators often look to external stakeholders and factors when considering the primary drivers of damages and the possible solutions for reducing these damages. **Focusing instead on internal processes and policies, however, may be the most direct pathway to impacting broader external challenges in damage prevention.**

About half (48%) of survey respondents believe that excavation issues — specifically, not digging carefully once facility lines are marked — are the leading cause of damages to natural gas facilities. An additional 41% of respondents believe that the leading cause of damage is due to not contacting 811 prior to digging (SOURCE: Survey, slide 11).

To address what this group views as the main causes of damages to their assets, one in three facility owners/operators interviewed believed that better or increased enforcement of state dig laws with penalties would help decrease damages (SOURCE: Qualitative research report, page 27). Nearly half of survey respondents (44%) agree that more comprehensive enforcement of current regulations has the most potential to reduce damages to natural gas facilities (SOURCE: Survey, slide 16).

FIGURE 5 | STRATEGIES FOR REDUCING DAMAGES

Q | Which of the following strategies do you think have the most potential to reduce damages to natural gas facilities? (Select up to three)



SOURCE: Survey, slide 16

KEY TAKEAWAY #2

CONTINUED

While improved legislation and enforcement are valid approaches to reducing damages, regulation changes often take years to enact, let alone to become an effective enough deterrent to significantly modify behavior. Given the visibility this stakeholder group has within the industry and among the general public, in addition to lending its support to efforts to strengthen regulation and enforcement, **natural gas stakeholders can leverage their awareness, education and training interventions to reduce damages in the short term.**

A number of natural gas distribution organizations have successfully changed their approach to damage prevention and have helped reduce damages in ownable, internal ways.

FIGURE 6 | SUCCESSFUL STRATEGIES FOR REDUCING DAMAGES

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After experiencing a plateau in damages, one participant shared that their organization renewed its focus on damage prevention that included **creating a damage prevention summit** with their administrators, creating a prevention roadmap, and **creating a damage prevention champion group that meets monthly to review incidents and identify opportunities to break the cycle.** Using this new focus and strategy they have significantly reduced their damages since 2020.

“

One participant said their company has reduced damages 50% in the last 10 years by being proactive and **using a risk modeling program in which they score all tickets that come in on the likelihood of damage** and the consequence of damage.

(SOURCE: Qualitative research report, page 24)

As previously discussed, natural gas distribution stakeholders also **invest in both reactive and proactive excavator training and awareness initiatives** to address the excavator issues that contribute to a significant portion of damages. More than half of survey respondents (56%) identify excavator education and training as the strategy with the most potential to reduce damages (SOURCE: Survey, slide 16), and these avenues are excellent opportunities for utility owners/operators to own their safety message and leverage their influence to spread it.

Research also shows that materials from utility owners/operators are a trusted source of safe digging information for excavators. Among the excavators surveyed for CGA's Excavator White Paper, **34% reported relying on materials from utility owners/operators to reference safe digging practices**, identifying it as the third-most cited source of safe digging information (SOURCE: [Excavator White Paper](#), page 15). Thus, the creation of more educational resources and better distribution of these resources to excavators can be an impactful method of addressing a key source of damages.

Many external factors impact damage prevention across every stakeholder group and need to be addressed, but **focusing on internal programs and processes is a more efficient avenue to realizing damage reductions in the short term.** Because of their central role in the industry, natural gas distribution stakeholders have opportunities to influence excavator behavior — particularly that of their own contractors and subcontractors — as well as other facility owners/operators for the good of public safety and the entire damage prevention system.

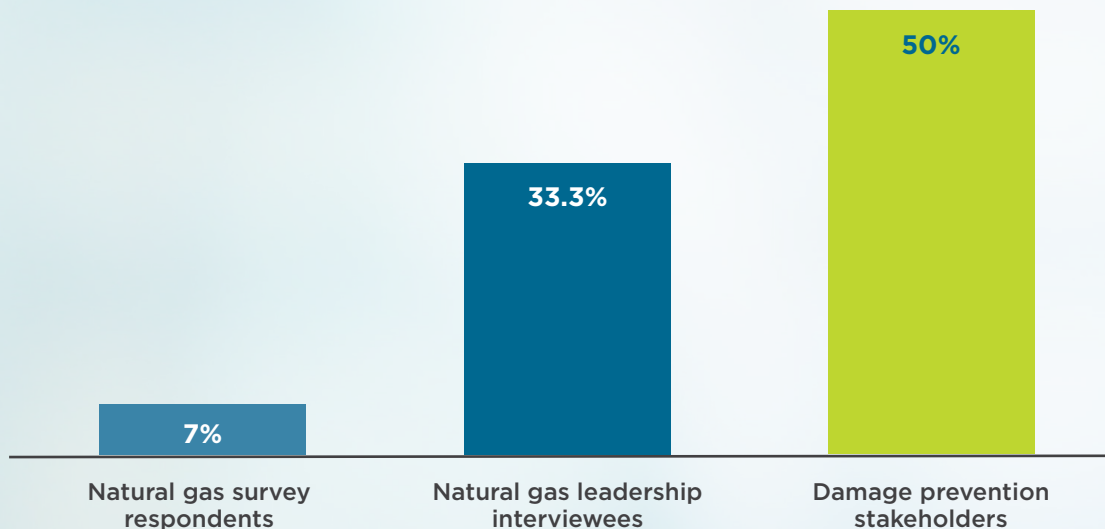
KEY TAKEAWAY #3

Improving locating through greater emphasis on mapping and fair contracts could help improve U.S. damage prevention as a whole.

In addition to excavator training and other internal programs, natural **gas distribution stakeholders can more efficiently prevent dig-ins by focusing on the two CGA Next Practices opportunities for systemic improvement that have serious impacts on timely and accurate locates**: improved facility mapping and fair contracts with other stakeholders that prioritize damage prevention.

Natural gas stakeholders can **better support the locating of their high-consequence facilities and those who excavate around them by providing accurate, up-to-date maps**. According to CGA's quantitative research, only 7% of natural gas employees surveyed believe locating issues are leading causes of damages to their facilities, significantly behind failure to notify and excavation errors (SOURCE: Survey, slide 11). Almost a third of interviewed participants shared this point of view (SOURCE: Qualitative report, page 18). In contrast, CGA's 2020 survey of damage prevention stakeholders found that more than 50% of respondents believed facilities not being marked and inaccurate line locates were the most critical challenges facing the industry (SOURCE: [Next Practices Report to the Industry](#), page 4).

FIGURE 7 | SENTIMENTS ON LOCATING ISSUES AS LEADING CAUSE OF DAMAGES



SOURCE: Survey, slide 7; Qualitative research report, page 18; Next Practices Report to the Industry, page 4

Updated facility maps were a nearly unanimous request from locators surveyed for CGA's Locator White Paper when asked about improving the accuracy and timeliness of locates: 99% of locators said more up-to-date maps would be an effective method to improve locating. Although they may not put an emphasis on locating issues to resolve persistent damage rates, surveyed natural gas employees do have high hopes for mapping and locating/marking technology's abilities to reduce damages (61% and 61% respectively, SOURCE: Survey, slide 20). Greater compliance with excavator notification practices will require facility owners/operators to be accountable to their role in the timely and accurate locating of their facilities, and **updated maps are the most efficient step toward improving locates**.

KEY TAKEAWAY #3

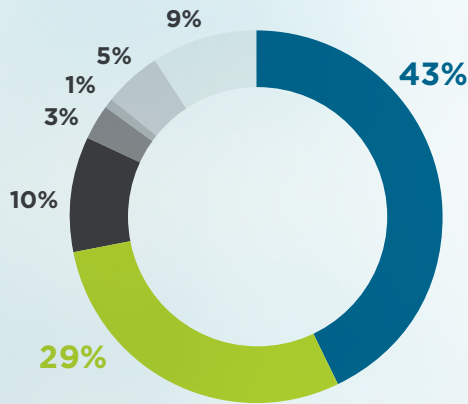
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Similarly, natural gas distribution stakeholders' relationships with contract locators and third-party excavators can also help restore confidence and reliability in the U.S. damage prevention system. **Locate contract structure can have a significant impact on safety outcomes:** CGA's Next Practices Status Report/ Pathways to Improving U.S. Damage Prevention notes how **Southwest Gas' use of best value contracts (with both locating and third-party construction firms) helped the company reduce damages by more than 20% in just over two years** (SOURCE: [Next Practices Status Report](#), page 7).

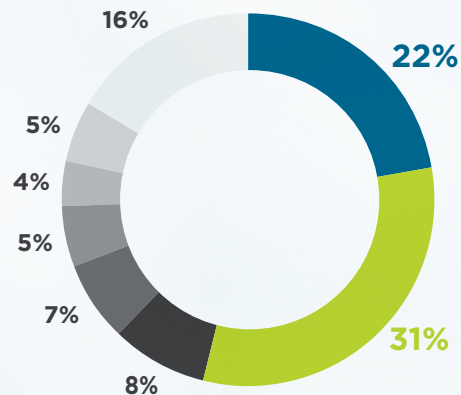
CGA's natural gas quantitative research demonstrates a subtle disconnect among respondents between how they incentivize employees' performance versus that of contractors: safety record is of the highest importance in incentivizing employee performance, followed by quality of work — for contractors, quality of work is of highest importance with safety record 9 percentage points behind (SOURCE: survey, slide 19). When working with subcontractors, structuring contracts and relationships to prioritize safety, damage prevention and adherence to Best Practices can make a significant impact on damages.

FIGURE 8 | DIFFERENCES IN IMPORTANCE OF SAFETY RECORD FOR EMPLOYEES VS. SUBCONTRACTORS

Q | Which of the following does your organization place the most importance on when **incentivizing employees**?



Q | Which of the following does your organization place the most importance on when **incentivizing contractors and/or subcontractors**?



■ Safety record	■ Quality of work	■ Efficiency	■ Quantity of work
■ Damage record	■ Timeliness	■ Other	■ Unsure

Base: Total Sample, n=178

SOURCE: Survey, slide 19

While reducing damages caused by failure to notify or other poor notification practices is indeed a key priority for the industry as a whole, excavator confidence in the U.S. damage prevention system must be restored before we are likely to make notable progress on these root causes. **Natural gas stakeholders can make a significant impact on damages in the near-term by focusing on their responsibilities to locate facilities accurately and on-time through updated facility maps and realistic contracts** — both of which are likely to contribute to restoring excavator trust in the system and better excavator notification practices.

KEY TAKEAWAY #4

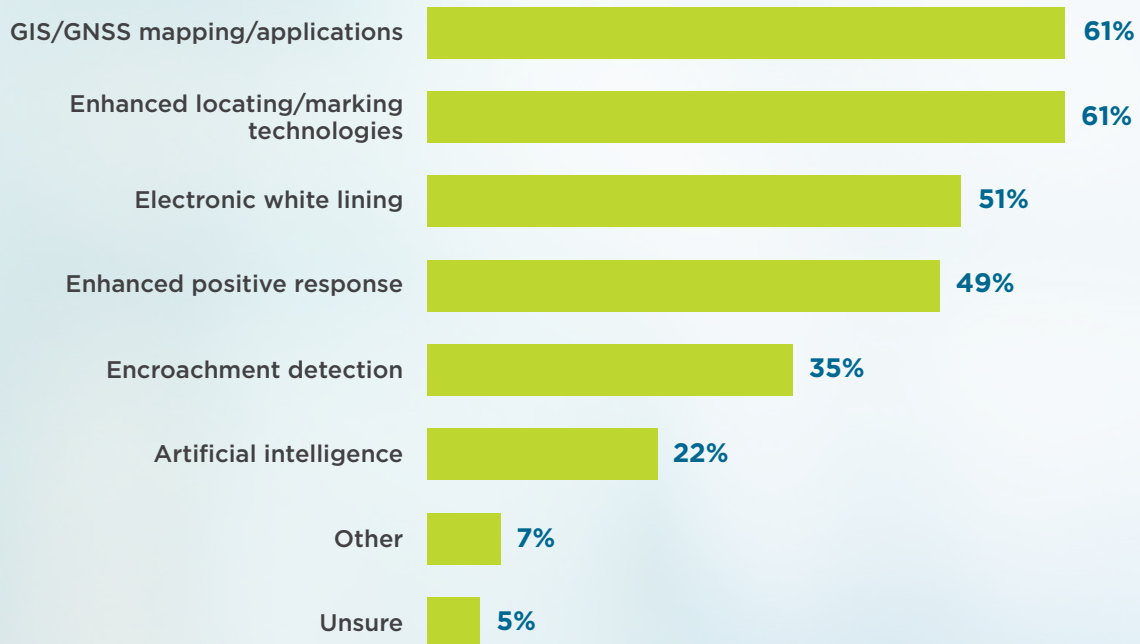
Seizing opportunities to increase investments in technology will be critical to reducing damages to natural gas facilities.

There is consensus among natural gas stakeholders that technology and innovation are critically important to damage prevention, and will play a key role in reducing damages in the future. A growing industry focus on Environmental, Social and Corporate Governance (ESG) could position damage prevention departments to make more strategic investments in leading-edge technology in the next five to ten years that will help reduce their environmental footprint while improving damage outcomes.

Encouragingly, natural gas stakeholders are enthusiastic about how technology can reduce damages. More than half of surveyed employees believe that GIS/GNSS mapping, enhanced locating/marking and electronic white-lining (EWL) technologies could help reduce damages to their facilities (SOURCE: Survey, slide 20). There is a great deal of overlap with locators' technology priorities and those of the entire damage prevention industry as well (SOURCE: [CGA 2022 Technology Report](#), page 5).

FIGURE 9 | TECHNOLOGY TO REDUCE DAMAGES

Q | What technological advances could help reduce damages in the natural gas industry?
Select all that apply



SOURCE: Survey, slide 20

Importantly, this sentiment about harnessing the power of technology to drive down damages is also prominent among the interviewed natural gas distribution industry leaders: **“Most participants think new technologies will be beneficial in reducing damages, especially when it comes to more accurate GPS and mapping technologies;** however, cost is a point of contention for a few,” (SOURCE: Qualitative report, page 36).

KEY TAKEAWAY #4

CONTINUED

FIGURE 10 | SUCCESSFULLY DRIVING DOWN DAMAGES WITH TECHNOLOGY

“We’ve reduced damages over 50% in the last 10 years. So, we’re more proactive, we have a risk modeling program. We score all our tickets that come in on the likelihood of a damage and the consequence of a damage. So, we try and do proactive risk mitigations versus reactive.”

— Manager

SOURCE: Qualitative report, page 20

The cost of adopting and adapting new technologies can be a significant barrier — however, **ESG concerns may provide an opportunity for damage prevention professionals in the natural gas industry to secure funding for strategic investments in technology that can drive down damages in the near-term.** Surveyed employees’ top response when asked about external factors facing the natural gas industry was public opinion on energy sources (SOURCE: Survey, slide 9). Similarly, interviewed leaders and managers in the natural gas industry relayed the extent to which environmental and safety concerns among the general public are likely to drive an emphasis on damage prevention that could make the case for technology investments (see quotes below). As noted in the 2020 DIRT Report, damage prevention can be considered a key part of ESG given the potentially disastrous environmental effects of striking certain facilities (SOURCE: 2020 DIRT Report, page 13).

FIGURE 11 | FUTURE OF DAMAGE PREVENTION AS AN ESG CONCERN

“Damages are the largest ... controllable source of methane leaks, and the industry’s ability to earn public approval to keep operating is going to hinge in part on demonstrating that it is being responsible about how it is managing the methane that is running through its pipes.”

— Manager

“I think the future of damage prevention is technology. And just, we’re going to have to take the human piece as much out of it as possible and replace it with no fail options.”

— Manager

SOURCE: Qualitative report, page 42

Mapping, locating, AI/risk modeling, education/training and communications technologies can all be leveraged to drive the next dramatic reduction in damages to buried facilities — and many of these are in use now by innovative facility owners/operators, including natural gas distribution stakeholders. CGA’s recently published [2022 Technology Report](#) contains several case study examples featuring natural gas distribution companies’ successful application of emerging technologies to achieve better damage prevention outcomes. Over the next decade, securing leadership buy-in and funding for strategic, integrated investments in damage prevention technology will be key to making the next meaningful reduction in damages to buried infrastructure.

CONCLUSION

LEVERAGING LEARNINGS AND INFLUENCE

Natural gas stakeholders are one of the most publicly visible sectors in the damage prevention industry, which presents both opportunities and challenges. They have the dedicated resources to conduct awareness and training outreach to both professional excavators and homeowners, but these companies can also suffer intense public relations fallout after damages and other incidents occur, presenting perception challenges as this group looks to the future.

With so much at stake, our research shows that safety and damage prevention are top priorities for natural gas distribution stakeholders. They recognize that poor safety records pose an existential threat, and are highly motivated to protect their facilities, workforce and the communities they serve. Leaders in natural gas distribution are moving not only their sector of the industry forward, but providing instructive examples to all damage prevention stakeholders for reducing dig-ins and near misses.

Natural gas companies who have successfully driven down damages recognize the impact of not only their internal processes and procedures, but also their relationships with other key damage prevention stakeholders in making the system more reliable. Technology investments have played a key role in helping natural gas and other facility owners/operators achieve remarkable reductions in damages — but the next decade of tech integration and advancement will be critical to meaningfully moving the needle toward better safety outcomes.

CGA would like to thank our natural gas members and stakeholders for their participation in this research, and their ongoing commitment to driving down damages. We encourage you to review the reports and resources listed below and share them with your colleagues. If you are not currently a CGA member, consider [becoming a member of the Common Ground Alliance](#), submitting data to the [Damage Information Reporting Tool \(DIRT\)](#), getting involved with a CGA committee and attending the [2023 CGA Conference & Expo](#) — these are the venues where the damage prevention industry will be mapping our road to zero damages.

ACCESSING CGA RESEARCH REPORTS

CGA members can access the two new natural gas industry research reports on which this White Paper is based:

SURVEY: Natural Gas Industry

This deck reviews findings from research among 178 U.S.-based employees in the natural gas industry completed via an online survey designed to measure their awareness of safe digging practices, their views around damage prevention and the challenges in the industry that they believe contribute to damages.

INTERVIEW REPORT: Gas Distribution Industry Exploratory Study

For this report, 15 decision-makers from natural gas distribution companies participated in one-on-one interviews to understand the factors that contribute to their organizations' decisions around damage prevention, perceived causes of damages to facilities and their general awareness of 811.

Additional data-driven CGA resources and reports available to members and referenced in this report include:

CGA White Papers:

- [Data-Informed Insights and Recommendations for More Effective Excavator Outreach](#), 2019
- [Insights into Improving the Delivery of Accurate, On-Time Locates](#), 2020

Next Practices Initiative Reports:

- [Next Practices Initiative Report to the Industry](#), 2021
- [Status Report: Pathways to Improving U.S. Damage Prevention](#), 2021

[2020 DIRT Report](#)

[2022 Technology Report](#)

Southwest Gas Living Case Study: [Reducing Utility Infrastructure Damage Frequency Through Best Value Contract Deliverables](#)

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