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UNSEEN THREATS TO TEXAS CRITICAL INFRASTRUCTURE:

**THE RISK TO BURIED UTILITIES AND
TARGETED POLICY SOLUTIONS TO PROTECT THEM**

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Abstract

Excavation damage to underground infrastructure is a nationwide challenge. Ranging from a local nuisance to both lethal and regional crises, the damage and costs from buried facility strikes are almost entirely preventable. Texas is at unique risk because of its concentrated energy infrastructure, its considerable and growing population, and its competitive economy that ensures constant development activity. Each of these factors correlate to excavation damage and help explain why Texas routinely leads the nation in excavation damage incidents that disrupt critical energy and services. Billions of dollars in economic harm, waste, and inefficiency emanate from this issue and ripple throughout the Lone Star State every year. Solutions include systemic implementation of validated technology, adherence to best practices, and public policy reforms proven to reduce this damage to virtually zero – sparing lives, saving dollars, and protecting critical infrastructure.

Key Words:

Damage Prevention, Excavation, Pipelines, Utilities, Infrastructure, Natural Gas, One-Call, 811

Bio

Benjamin is the Executive Director of the Alliance for Innovation and Infrastructure, specializing in economic, administrative, and legal aspects of American energy, transportation, infrastructure, and innovation. His goal is to analyze and explain the economic and legal realities underpinning public policy at the state and federal level. He strives to bring a balanced, accurate, and accessible perspective to enable students, specialists, the public, and elected representatives to make the best informed decisions on these critical issues.

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Introduction

Texas is the energy capital of the world and facilitates the exploration and production, transportation, refining, and consumption of oil and gas as well as wind energy at higher levels than anywhere else in the United States. Texas uniquely features its own energy grid, distinct from the Eastern and Western Interconnections that unite the rest of the states with one another. These energy infrastructure components result in millions of linear miles of pipelines, cables, and wires spanning the state. While many of these assets are overhead, such as powerlines and telecommunications towers, a significant proportion is buried – a process known as *undergrounding*.

Among the buried facilities in the Lone Star State are 488,564 miles¹ of pipelines, more than any other state.² As the top class of critical infrastructure – and also the most dangerous if damaged – the over 230,000 miles of natural gas pipelines receive heightened focus. Together with these pipelines, there are a total of over 7 million miles of pipes, cables, and wires comprising the Texas network of underground infrastructure.³ The true mileage is likely even higher, and Texas hosts over one-quarter of all buried infrastructure in the United States.⁴

Every construction project that involves breaking ground, including thousands of landscaping tasks, home projects, and other digging activities, puts buried infrastructure at risk. This not only threatens to damage the infrastructure itself but can result in serious injury or death to the excavator or homeowner. Moreover, it results in extensive economic consequences that ripple throughout the community.

This makes every digging project a potential safety risk, economic risk, and environmental concern due to the potential to strike buried service lines that are powering the community. The more digging that takes place, the more these risks arise.

Since 2020, Texas received the highest number of new residents of any state.⁵ All factors indicate that the Texas population will continue to grow,⁶ which will result in both greater construction spending and development activity. The growing population will require more utilities to serve their needs – increasing demand for undergrounding of new pipelines, buried cables and wires, and related infrastructure. This will in turn require new trenches and digging to place these lines underground, which threatens existing buried facilities and increases the total amount of buried infrastructure, thus increasing the probability of future damage.

¹ Texas Railroad Commission. (2023). *Texas Pipeline System Mileage*. Texas Pipeline System mileage. <https://www.rrc.texas.gov/pipeline-safety/reports/texas-pipeline-system-mileage/>.

² Texas Railroad Commission. (2023). *Texans need to call 811 before digging projects*. Texas Railroad Commission. <https://www.rrc.texas.gov/news/040821-safe-digging-month/>.

³ The number is likely much higher, as this figure is older than two years old. See, <https://texas811.org/pdf/Texas811-Digital-Ads.pdf>.

⁴ See, Dierker, B., (2020). *The Longest Running Statistic*. Alliance for Innovation and Infrastructure. Aii.org.

⁵ U.S. Census Bureau. (2023, April 3). *Growth in U.S. population shows early indication of recovery amid covid-19 pandemic*. Census.gov. <https://www.census.gov/newsroom/press-releases/2022/2022-population-estimates.html>.

⁶ From Texas's fifth highest birth rate in the nation, from high domestic migration, and its unique position on the border receiving international migration. See, *Fastest Growing States 2023*. Fastest growing states 2023. (2023). <https://worldpopulationreview.com/state-rankings/fastest-growing-states>.

These factors raise questions about the current state of critical buried infrastructure in Texas, what solutions and processes are currently in place to address it, and what private sector and public responses may be warranted.

State of Buried Infrastructure in Texas

While visible infrastructure gets the most attention, out-of-sight components are very often out-of-mind. In Texas, surface-level infrastructure is often well-maintained and safe. For instance, the state ranks 51 out of 52 for percentage of structurally deficient bridges – in other words, Texas is second only to Arizona in having the lowest percentage of the state’s bridges in need of critical repair. ^[66] Below ground is another story.

Texas reports the highest number of excavation damage events in the country every year at nearly twice the level of the next highest state.⁷

Nationally, the most-damaged facility is telecommunications lines followed by natural gas pipelines.⁸ In Texas, this same trend is observed – although in 2021 damage to natural gas pipeline from excavation were reported at a higher level than any other facility type.

These facilities are each critical, and disruptions have far-reaching consequences. Damage to telecommunications lines may not strike the average person as highly consequential, but it should be a cause of concern. When these lines are cut, individuals, homes, businesses, and even entire communities may lose access to the Internet or related communications services. This shuts economic activity, interferes with modern appliances, creates cyber and building security concerns, and threatens the interconnectedness of modern technology and society. Repair may take hours or days, and the costs climb the longer Texans are without Internet, phone, and other related services.

The risks associated with natural gas pipeline damage need less explanation. From silent gas leaks to fiery explosions, there are fatal consequences to striking these lines, which also come with serious price tags. Alarmingly, in Texas natural gas pipelines are experiencing more damage from excavation each year. Even in 2020, when national excavation damage rate fell due to construction slowdowns and COVID-19 policy disruptions, the number of excavation damage events to natural gas pipelines in Texas increased. Similarly, in 2021, when the state’s primary damage reporter sent no records to the industry tracker, there was still an increase in reported digging-related damage to natural gas pipelines. This likely means the true excavation damage numbers are even higher, and natural gas distribution lines in Texas are particularly at risk.

⁷ Reporting in 2021 was irregular and despite this, expert analysis maintains that Texas had the highest level of damage in that year, consistent with prior years. The discrepancy is explained by a primary reporter in the state failing to report damage for that year. See, Common Ground Alliance. (2022). *Damage Information Reporting Tool Interactive Dashboard*. <https://commongroundalliance.com/DIRT-Dashboard>. and Dierker, B. (January, 2023). *Improving Upon Our Dig Laws: Why Data Must Take Center Stage to Reform Damage Prevention*. Alliance for Innovation and Infrastructure. <https://www.aii.org/wp-content/uploads/2023/01/Improving-Upon-Our-Dig-Laws-2021-Data.pdf>.

⁸ Supra note 8, DIRT Explorer.

Reported Unique Damages by Facility Operation

Year ● 2019 ● 2020 ● 2021

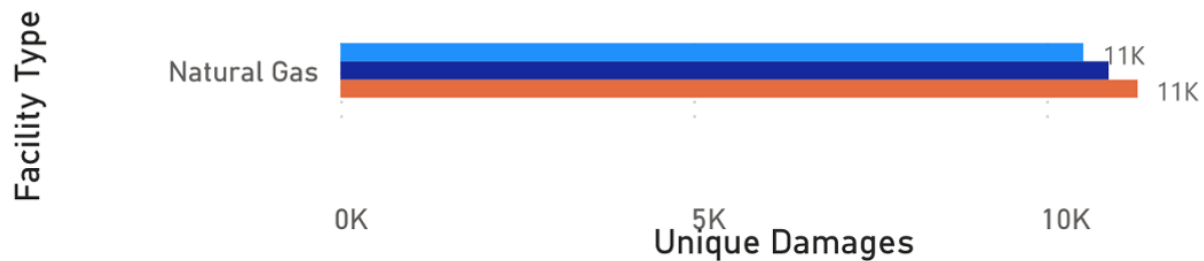


Figure 1: Three-year trend in excavation damage to Texas natural gas infrastructure (Source: Common Ground Alliance)

According to data from the Pipeline and Hazardous Materials Safety Administration (PHMSA), Texas has a disproportionate pipeline excavation damage problem compared with other states. In 2022, for all reported pipeline excavation damage incidents across the country, 18.9 percent occurred in Texas.⁹ Even though it is a single state, we know Texas has more mileage of pipelines than most states, so that is not cause for concern on its own. The disproportionate impact is seen more clearly in the reported costs and product lost associated with these pipeline strikes.

Last year, the share of reported costs for all national pipeline damage that occurred in Texas was 82 percent, while Texas represented 100 percent of the reported barrels spilled from excavation damage nationally.¹⁰ At over \$8 million and nearly 6,000 barrels spilled, Texas residents, environment, and infrastructure experienced real negative impacts; but even this is only a partial picture.

While those incidents had to be reported to the federal government, they only involve a handful of facility types, namely certain gas distribution, hazardous liquids, and gravity and reporting-regulated gathering hazardous liquids lines. This small set of pipelines under federal jurisdiction pale in comparison to the linear mileage of other gas and liquid transmission and distribution lines, telecommunications cable and wire, electrical lines, and other public utilities.

To understand the overall impact, we can look to the Common Ground Alliance (CGA), the trade organization comprising stakeholders from across industries in excavation, utility locating, utility owners and operators, and others. CGA compiles voluntary damage reports across all infrastructure types and also presents a framework for understanding direct and indirect costs from excavation damage. The ripple associated with a single pipeline incident, for instance will go on to impact the community at large and even the entire state economy.

⁹ Pipeline and Hazardous Materials Safety Administration. (2023). *PHMSA Pipeline Incidents: (2003-2022)*. US DOT Pipeline and Hazardous Materials Safety Administration. <https://www.phmsa.dot.gov/data-and-statistics/pipeline/pipeline-incident-20-year-trends>.

¹⁰ *Id.*

By a factor of 30:1, indirect costs are borne by individuals and communities entirely uninvolved in the excavation and construction process.¹¹ These include road closures, emergency vehicles, construction delays, traffic, lost services (e.g., water, internet, power), lost productivity, and over a dozen other impacts.¹² This means that just the relative handful of pipeline incidents from Texas in 2022 – that were reportable to the federal government and overseen by PHMSA (reportedly \$8 million) – likely cost Texas residents a total of around \$250 million in both direct and indirect costs.

When the other thousands of digging-related damage incidents to non-federally-governed pipes, cables, and wires are added in, Texas faces upwards of \$4 billion annually in avoidable economic harm.¹³ These expenses manifest in out-of-pocket dollars, lights not turning on when the switch is flipped, Internet outages, traffic delays, and many other impacts statewide.

In Texas, a typical year results in over 70,000 reports of excavation damage.¹⁴ These reports are made voluntarily by industry stakeholders, which means that many buried facility strikes go unreported. The reports may come from the excavator, locators, 811 call centers, utility companies, bystanders, or other stakeholders. After telecommunications and natural gas infrastructure, these excavation incidents result in damage to Texans' cable, electric, water, sewer, other liquid pipe, steam, and more buried utilities.

Another interesting feature of excavation damage in Texas is its seasonal damage numbers. While nationally, the summer is the peak for excavation damage, Texas appears to peak in September and into the fall. This may be due to weather and climate in Texas, making summer construction less desirable or efficient.

It also presents a unique opportunity for Texas to lead on this issue, learning from national trends occurring in the months before and implementing systemic reforms ahead of its own construction peak.

¹¹ Common Ground Alliance. (October, 2020). *Damage Information Reporting Tool, Volume 16*. <https://commongroundalliance.com/Portals/0/Library/2020/DIRT%20Reports/2019%20DIRT%20Report%20FINAL.pdf?ver=2020-10-14-185343-180>.

¹² Zeiss, G. (2020, April 14). *Cost of underground utility damage represents a major drag on national economies*. Between the Poles. <https://geospatial.blogs.com/geospatial/2020/04/cost-of-underground-utility-damage-represents-a-major-drag-on-national-economies.html>.

¹³ Infrastructure Protection Coalition. (2021). *Texas Report, 811 Emergency, \$61 Billion Lost to Waste, Inefficiency in System to Protect Underground Utilities*. <https://www.ipcweb.org/images/reports/TX-RPT.pdf>.

¹⁴ The reported figure for 2019 is 70,011. The data for 2020 was atypical due to COVID-19, while in 2021 the largest stakeholder group in Texas failed to provide voluntary reporting thus negating the data quality considerably.

Damage Timeline

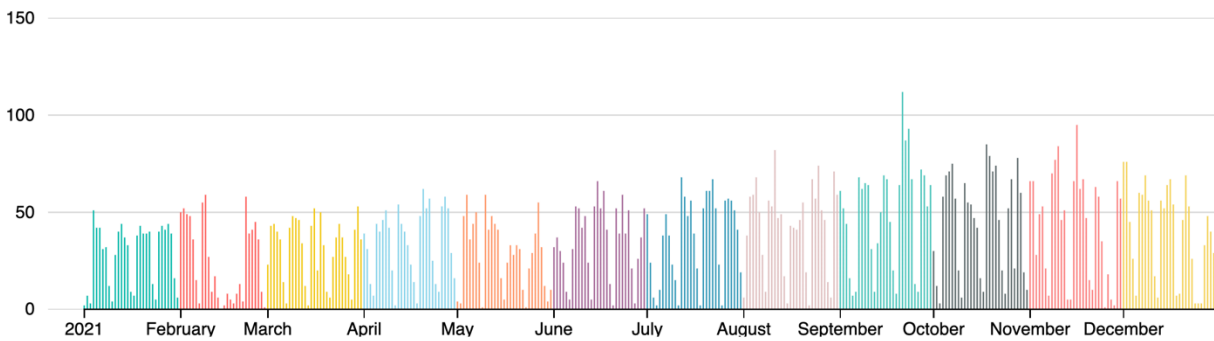


Figure 2: Timeline of reported excavation damage events in Texas in 2021 (Source: Common Ground Alliance)

Current Solutions and Processes

There is a process for preventing excavation damage that is longstanding and well-established. With proper use of the 811 “call before you dig” process, virtually every excavation project can avoid striking buried utilities irrespective of how many lines may be underfoot.

The process is simple: anyone doing any digging with shovels, rakes, augers, backhoes, excavators, or other ground-breaking tools notifies 811 – either by phone or on the state’s call center website – to present advanced notice of a dig and to request utility locating. The one-call center enters the information to see whether the proposed excavation site overlaps with known facilities in their database, which is created by utilities submitting their records. Any overlap results in outbound notifications to the implicated facility owners/operators. Those utility operators then send in-house or third-party contract locators to the site to identify and mark the presence and location of any buried facilities with color-coded spray paint markings to designate the tolerance zones for the buried infrastructure. This spray paint displayed across city streets, sidewalks, and green spaces are the guidelines excavators use to avoid striking buried utilities.

The Texas 811 system is one of the best in the nation, despite the record of high damage numbers. The call center offers homeowners and excavators a log-in portal, where they can provide notice of their intent to dig and request a location. From there, they can also check the status of their ticket and see which utilities will have to respond and whether each has it in real time.

There is a mapping tool integrated with GoogleMaps that allows excavators to designate their dig site from an overhead perspective. This allows the excavator or homeowner to set a GPS pin over their dig site or draw a rectangle that covers the area of the dig. However, many virtual fields are not required, and an excavator can provide poor information to the call center and by extension to the utility companies and their locators.

Overall, the process offers great potential but does not extract the highest value from it. Despite considerable advancements in technology and best practices, the overall process of notifying a call center and receiving spray paint markings at a proposed dig site looks virtually identical to

the how it looked a decade ago, if not last century. While industry stakeholders boast that when 811 is called, damage is avoided 99 percent of the time, there are many incidents that still happen after a call has been made and there are considerable costs associated with the current process.

Astonishingly, experts assess that there is an *additional* \$4 billion in annual costs dragging on the Texas economy that actually comes from the process of preventing excavation damage in the first place. These are *not* damage costs nor do they represent investments; rather this sum represents waste and inefficiency within the system. That means that joined with the direct and indirect costs rippling through the community from damage, there is a combined total of \$8 billion in economic harm and drag on the Texas economy every year. Fortunately, virtually all of this multibillion-dollar harm can be streamlined and eliminated while preventing more damage than before and ensuring safer construction and infrastructure reliability for every Texan.

Needed Solutions and Processes

Texas has more buried infrastructure than any state and has the second largest economy within the United States. It is only reasonable, then, to expect a higher level of excavation damage, given the strong correlation between construction spending and damage to buried utilities. But the damage prevention process promises to prevent damage regardless of how much infrastructure is beneath the ground and how much ground-breaking occurs.

Texas stands to be the uncontested leader in reducing its damage numbers by implementing reforms that would make good on the promise of damage prevention. Given the state's high mileage of buried utilities and active construction industry, it could achieve a disproportionately *low* level of excavation damage.

Many of the processes needed are ready to be implemented systemically within the existing process. Not only are they available, but they are also consensus best practices, not only by unanimous industry approval, but by validation and recommendations from key safety agencies in the federal government. Texas is already halfway to fully integrating these, and through close collaboration between industry and policymakers, the Lone Star state can lead the nation as the lone state with all key reforms in place.

The four key steps include continue promoting use of web-entry locate requests, allowing ticket scheduling and prioritization, integrating electronic white-lining, and ensuring systemic use of enhanced positive response.

Contacting Texas811

In 2005, the Federal Communications Commission designated 8-1-1 as the "Nationwide Number to Protect Pipelines, Utilities from Excavation Damage." This enormous leap forward consolidated the thousands of 10-digit phone numbers from state call centers and individual utilities spread across the country into a unified program that operates like 9-1-1. Homeowners or excavators simply dial 811 from anywhere and reach their state or regional call center.

“Call 811 Before You Dig” and similar variants became the nationwide slogan that has been reinforced in marketing campaigns for nearly two decades. Recently, however, there has been a national shift toward excavators using their state’s call center website to directly enter their dig information. Web-entry (or online portal) tickets have been shown in some places to reduce damage in half relative to call-in notice. With this finding, alongside the revealed preference and industry trend, a more intentional move to web-entry should be cultivated with less reliance on “calling” before you dig as a central message.

Texas already uses “contact 811” rather than “call” or “dial” like other states. This helps express neutrality between “clicks and calls,” but there is room for improvement.

In Canada, “click before you dig” is the preferred slogan, because 811 was already designated for another purpose in that country. This preferential marketing helped lead to over 75 percent of incoming locate requests to be made online rather than by phone. When notification center leaders in Canada assessed the impact of web-entry and call-ins, they found that among known damages for which notice was given, calls were responsible for twice the damage of web-entry. Simply stated, “Analysis has proven that the online locate request process significantly reduces damage to underground infrastructure. The more we shift Calls to Clicks, the less damage there will be.”¹⁵ It also allowed a streamlined process, eliminating redundant or unnecessary overhead and personnel to operate phones even while increasing hour of operations and expanding service areas.

In Texas, the “*contact*” or “*connect*” with 811 has flexibility, but still fails to encourage the more efficient and damage-preventing online portal. Because the website URL includes the phone number (Texas811.com), many excavators will likely utilize the online function even if directed to “811” generally. Still, a more intentional approach to direct excavators to the website would help reduce damage and streamline costs, directly affecting both sides of the \$8 billion annual economic drag in the state.

Ticket Scheduling and Prioritization

Part of what makes web-entered tickets desirable is that excavators can enter information at their own pace, submit multiple locate requests at once, and use the website at any time of day or night. Once on that platform, however, homeowners and excavators have a rigid option: request a locate to be performed in the next two business days.

Excavator interests are not always aligned with the interests of locators or utility companies. It is not uncommon for excavators to request a locate for a large scale project only to complete a small portion of the work within the ticket window. This necessitates additional locate requests and site visits by locators to refresh or update the marks – or leads excavators to dig outside of the ticket window in violation of law and best practices because old marks are present. Offering a scheduling option would likely ensure more efficient locating, which would both streamline costs and reduce locator burdens and error, again tackling both sides of the \$8 billion coin.

¹⁵ British Columbia Common Ground Alliance. (2017). *QR Code To Click Before You Dig!*
<https://commongroundbc.ca/april-is-safe-dig-month/qr-code-to-click-before-you-dig/>.

There is currently no option for scheduling in standard online portal requests. Further, while all tickets are free, offering a paid alternative could incentivize marginal excavators to provide notice rather than risk digging. That is because some excavators on tight deadlines choose not to provide notice and wait two days – in fact, according to research from North Carolina, as much as 85 percent of “no call” damage likely comes from excavators who know about 811, but who choose not to provide notice. Offering optional, low cost, paid priority tickets may be worth it to capture this significant proportion of stakeholders.

Improving Electronic White-Lining

All 16 stakeholder groups within the Common Ground Alliance have unanimously agreed that electronic white-lining is a best practice and that it should be the first step in the ideal dig of the future. Texas811 offers a resource that reaches toward this goal but requires improvements to unlock its full potential.

When submitting a locate request, Texas811 does ask if the excavator has used white spray paint, stakes, or flags to designate the project area, stating “These markings show the locators exactly where you intend to dig.” Nevertheless, it is not required either by the call center or state law. This simple step could be required by law, although a simpler option is to incorporate virtual processes alongside a web-entry locate request.

Texas811 offers a map interface that enables excavators to draw their dig site onto a GoogleMap. More impressively, the platform allows users to switch between a road map view, a terrain (satellite) view, and a hybrid view, and even gives the option to view Bing versions of these aerial maps. This map is used to generate a polygon to overlap with known utility lines on the call center’s side of the system.

The benefit of electronic white-lining is that it offers excavators the ability to pre-mark their dig site from a remote location, which eliminates waste like multiple unnecessary site visits. It also allows a unique aerial perspective for the excavator to clearly and precisely delineate the actual dig they intend to undertake. By doing so virtually, they unlock the benefits of physical pre-marking with white spray paint while giving locators and utility companies the clearest view of where digging will occur. By sharing this virtually, it may help screen out unnecessary locates, and can spare locator resources by narrowing the area in need of marking.

In Texas811’s online portal, the pre-marking tool specifically explains to “Use this tool to draw a rectangle **around your property**” (emphasis added). It does not say “around your dig site.” This partially undermines the purpose of pre-marking with a virtual tool. All this does is ensure the locators go to the right address, without narrowing down the location of the dig.¹⁶

The reform would be to allow the excavator to drop multiple points to form or draw their own pre-dig polygon and send it in addition to the buffered notification polygon. This way, all relevant utility companies are still notified because of the larger buffer zone but they and their locators can also see where the excavator intends to dig precisely. For a given home landscaping

¹⁶ For a homeowner locate, this is likely not a problem, but on larger property or for professional contractors working at commercial or larger developments, having a more precise tool is important.

project, with an input rectangle of approximately 315 feet in perimeter and 6,500 square feet in area, the polygon Texas811 generates to notify utilities is as much as 895 feet in perimeter and 44,800 square feet, an increase of around 185 percent in perimeter and 500 percent in area.

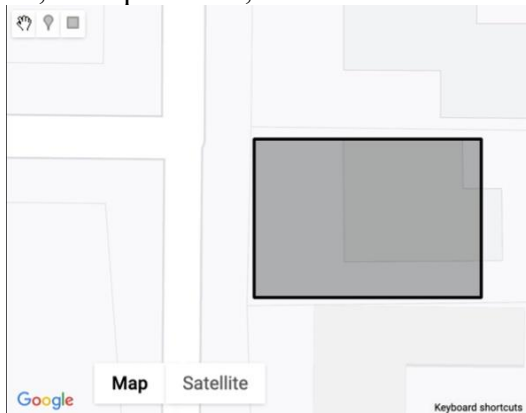


Figure 3: Excavator-entered dig site identification

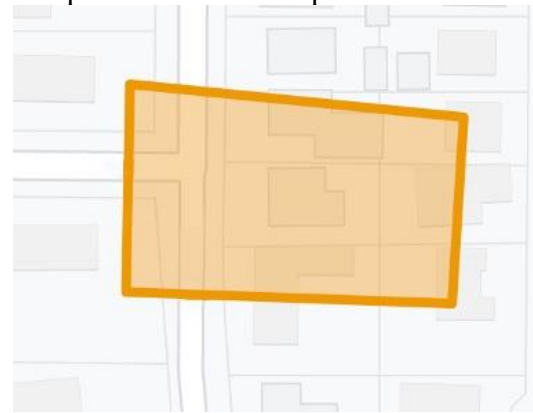


Figure 4: Texas811-generated buffer that utility/locator sees.

The size of the buffer may contribute to over-notification – that is, more utility companies being notified by the call center of a proposed dig, who then are responsible for paying the call center for the notice.

While Texas buffer size is not unreasonable,¹⁷ it does demonstrate that there is room for improvement, particularly by allowing excavators to draw their own polygons (not limited to fixed rectangular shapes) and providing the actual excavator-drawn polygon in addition to the buffer zone to utility owners and locators, which might look like a smaller grey box inside of the orange notification polygon.

The orange buffer is important for ensuring all potential facility owners in the area are notified, but the gray box is important because it shows where the digging will take place. With a more precise tool than a rectangle, this could offer excavators the ability to draw out trenches, circles for trees and shrubs, irregular shapes for pools, and many other scenarios. On larger properties, this could help narrow down the specific location of the dig rather than locators only knowing excavation work will happen at that address. The locators would then be able to pay special attention to this area and ensure they are in the correct spot by cross-referencing with material on their mobile devices.

These commonsense benefits are why the Common Ground Alliance lists electronic white-lining as its number one step in the idealized dig by 2030 and why the group believes it has among the highest return on investment for any technological best practice. PHMSA also explains that by narrowing the dig site more precisely, it helps reduce damage and “every stakeholder benefits.”¹⁸

¹⁷ In fact, in other states, the buffer zone is inflated to as much as 6,700 percent in area, covering as many as 25 times the number of homes in a residential neighborhood.

¹⁸ VA, PHMSA. (2007). *Virginia Pilot Project Incorporating GPS Technology to Enhance One-Call Damage Prevention Phase I – Electronic White Lining Project Report*. U. S. Department of Transportation’s Pipeline and Hazardous Materials Safety Administration and the Virginia State Corporation Commission. https://primis.phmsa.dot.gov/comm/publications/Virginia_Pilot_Project_Report_Phase_I.pdf.

These combined factors improve stakeholder communication from afar, reduce unnecessary site visits, save time, save money, and reduce potential for damage – single handedly tackling numerous aspects of the systemic waste and inefficiency while reducing excavation damage and their associated costs.

Systemic Adoption of Enhanced Positive Response

Following the Common Ground Alliance’s best practice recommendations, the second step of the ideal dig of the future is the use of enhanced positive response.

Every locate request submitted to Texas811 will result in a “positive response” back to the excavator. This may be a markings or documentation left at the job site, callback, fax, or an automated response system to notify the excavator that the utility company has no facilities present (clear) or that the locator has completed the marking (marked).

In Texas, not only is this basic positive response guaranteed, but the call center offers an online portal to track the status of a ticket. This *electronic positive response* gives excavators more insight during the waiting period while underground infrastructure is being marked. It displays each utility company that was notified based on the buffered polygon and gives real-time status updates once the utility company has cleared the ticket or the locators have completed their work. The needed step is to allow commonly collected enhanced information to be made available to the excavator – a more complete way to close the communication loop opened by the excavator first notifying Texas811 and known as an *enhanced positive response*.

First piloted in 2014, enhanced positive response packages the ticket, virtual manifest, digital photographs, and in some cases, facility maps together for the excavator to access in their email or through the electronic portal hosted through the call center’s website. This was demonstrated to reduce damage by as much as 67 percent.¹⁹

The benefits apply to virtually every aspect of the excavation process and resulted in findings of improved jobsite safety, damage prevention, and job efficiency. Stakeholders found it to provide valuable improvements to communication; then less than three years later, enhanced positive response emerged as the number one recommendation of the leading damage prevention safety agency, the Pipeline and Hazardous Materials Safety Administration in a report to Congress.²⁰

Texas811 is geared towards enhanced positive response with a ticket check system that displays the full ticket and even offers a tab to “add/view attachments,” but the state and its call center can lead the charge by ensuring every locator shares photographs and related enhanced information to the portal or to the excavator directly.

¹⁹ (2014). *Enhanced Positive Response Pilot*. MISS Utility, Washington Gas, Pepco, Verizon, CertusView, UtiliQuest, Lamberts, Hinkle Construction. https://commongroundalliance.com/sites/default/files/EnhancedPositiveResponsePilot_June2014.pdf.

²⁰ (2017). *A Study on Improving Damage Prevention Technology*. U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration. <https://www.phmsa.dot.gov/news/report-congress-improving-damage-prevention-technology>.

PHMSA summarizes not only the benefit but where to build out the systemic use of this technological best practice: “Enhanced positive response coordinated through one-call centers needs wider implementation; it can vastly improve communication among all involved in the digging process and has been shown to reduce damage rates.”²¹

No Stand-Alone Solutions

The solutions to this industry must be systemic because the damage prevention process is collaborative. It requires a system that all stakeholders can utilize to communicate and share information to best protect critical infrastructure and worker safety. When these are done, economic and environmental protections follow.

In Texas, the four key solutions outlined above go hand-in-hand. Most of these are already in the works in Texas but are not yet the standard. Web-entered tickets already account for around 80 percent of incoming tickets each year, but the user portal can be improved with scheduling, prioritizing, and mapping features. The excavator notice generates a buffer area that is used to notify utilities in the area, but a virtual pre-marking is not available, and the utility companies and locators do not receive the more precise rectangle drawn by excavators online. The ticket check system offers great information with the potential to maximize communication and collaboration by facilitating the sharing of enhanced information.

Together, these reforms would drive damages to unprecedented lows, potentially leading Texas to best the damage levels of much smaller states even despite its unparalleled infrastructure network and booming construction sector. These reforms build on and complement one another, each strengthening the others. This is illustrated well in Canada, where the various features fit together,

In Canada, **on-line / web locate** requests have emerged as a preferred method of requesting a locate. Any person **requesting a locate** can do so **24/7/365** and is typically **able to plot or draw** their dig site on a sketch or map reducing the risk of misinterpretation to an Agent thereby **improving the damage prevention process**.²²

Excavators placing their own requests rather than having a phone Agent interpreting the request can **reduce potential utility strikes by nearly one half**, particularly in regions that have **virtual white-lining**.²³ (all emphases added)

The ability for excavators to access an online portal at any time of day or night, where they can draw a virtual pre-marking to pass along to the utility company and locators in addition to the buffer for notification that the call center generates is important. Ensuring the platform can host

²¹ *Id.*

²² (2020). *DIRT Report 2019*. Canadian Common Ground Alliance.
<https://www.canadiancga.com/resources/Documents/DIRT-Reports/DIRT%20-%202019-Eng-Final.pdf>.

²³ (2022). *DIRT Report 2021*. Canadian Common Ground Alliance.
<https://www.canadiancga.com/resources/Documents/DIRT-Reports/DIRT%202021-04B%20ENGLISH.pdf>.

the enhanced information provided from excavator to locators and as an enhanced positive response from locators to excavator is the major step in reducing damage by 67 percent – and far more with the other reforms combined.

Together, these also offer unique post-damage benefits. The nature of excavation makes determining fault, liability, and root causes difficult. When the ground is disturbed, any spray paint or site markings will be disrupted, and records can be lost. The one-call center's online platform serving as a central location for communication helps safeguard against this by generating and preserving electronic records of things like pre-marking/white-lining, digital photographs of the site, and other enhanced information. If a damage does still result, even with these tools in place, the root cause can be determined more easily, and accident investigators can gain key insights. Moreover, it can help shift stakeholder incentives to provide better records, so they do not get falsely assigned liability or partake in costly litigation.

With all of these reforms in place, stakeholder behavior is likely to change for the better. Streamlining the process will help eliminate waste and inefficiency on the front end. This will likely also encourage more use of the Texas811 system by “no-call” excavators and greater use of the tools within the online portal by those providing notice. The systemic use of these technological best practices also stands to eliminate the majority of excavation damages, sparing communities from devastating harms.

The use of industry-consensus and safety agency-recommended technological best practices will protect Texas's critical infrastructure and its people. This will reduce billions of dollars in economic waste, inefficiency, and harm that drags on the state every year while boosting public safety and environmental protections.

Without these reforms, Texas may be on a path toward greater risk to its infrastructure. Its rising population and development activity alongside its uniquely high mileage of buried assets demand that damage prevention receive heightened attention and targeted reforms. These are ready to deploy today to protect the state tomorrow.



INSTITUTE FOR HOMELAND SECURITY



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