DIRT 2024 ANALYSIS AND RECOMMENDATIONS

Damage Information Reporting Tool

CGA℠

To download or to access additional analysis, please visit dirt.commongroundalliance.com.

VOL. 21

Released August 2025. DIRT Annual Report for 2024.

AUGUST 2024

Dear Damage Prevention Stakeholders,

First, on behalf of CGA's nearly 4,000 members, I would like to thank the Data Reporting & Evaluation Committee for its tireless work and dedication to producing our annual DIRT Report, which remains the only comprehensive accounting of damages to buried infrastructure in North America.

As we publish the 2024 DIRT Report and **Interactive Dashboard**, our latest damage analysis reveals a clear trend: We are falling critically short of the progress necessary to drive real change. After encouraging progress in 2023, the 2024 data shows an increasing trend of total damages, with the CGA Index rising from 94 to 96.7. Damage rates continue to correlate with construction activity, and this predictable relationship highlights a core concern — our current trajectory will not achieve the transformative change our industry needs without true commitment and immediate investment.

We have made little progress in addressing entrenched damage root causes, particularly our top root cause year-over-year: failure to notify 811. Data collected across eight 811 centers indicated that when requesting standard locating services, excavators were delayed an average of 38% of the time due to a late locate. This uncertainty can affect excavator confidence in the 811 process, potentially perpetuating the notification failures we seek to eliminate. States with active locating and positive response enforcement programs have proven that this challenge is solvable, showing on-time rates significantly higher than their peers.

The Report outlines clear opportunities for the industry. The impact of the **Damage Prevention Institute (DPI)**, now with over 900 participants and 58 excavation companies completing peer reviews, is generating unprecedented insights into what works — and what doesn't — in damage prevention. These conversations reveal that companies with robust damage prevention programs, strong client relationships and comprehensive training consistently outperform their peers.

This year's analysis reveals another critical pattern: Utility work dominates the top 10 damage root causes, with water/sewer and telecommunications/cable TV work emerging as the riskiest. Past DIRT Reports and the **Next Practices Initiative** have documented stakeholders who achieved significant damage reductions — proving that reversing the trend is possible for organizations willing to invest. However, these sectors whose work dominates the top types of work performed when damages occur face unique policy challenges: Most water/sewer utilities will need public investments to improve, while rapid telecom deployment often outpaces local resources for locating.

The lack of overall progress in driving down reported damages over the last three years, despite documented success stories, demands an urgent response. Stakeholders who have invested in the systems, contracts and technologies that reduce damages show measurable positive results; it is past time for all stakeholders to do the same. Translating organization-level action to industry progress will require meaningful, consistent enforcement across all parts of the 811 process. The formation of the **Damage Prevention Action Center (DPAC)** represents a promising step toward this approach.

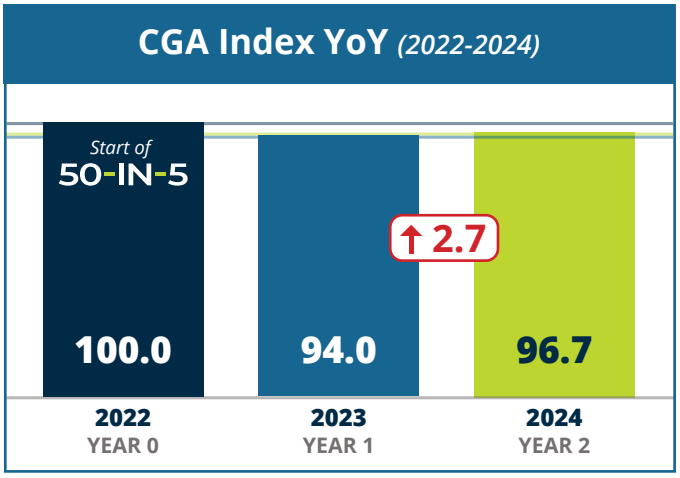
The time for incremental change has passed and the choice is clear: Invest in transformation or accept that utility damages will follow pace with construction activity. The stakes — public safety, service reliability and economic productivity — demand that we choose transformation. Together, we can achieve the dramatic improvement our communities deserve.

Be safe,

Sarah K. Magruder Lyle
President & CEO
Common Ground Alliance

Table of Contents

Executive Summary



Progress on Reducing Damages Plateaus

- Both the CGA Index and unique damages reported to DIRT indicate that damages were up slightly in 2024 from 2023.
- While the small increase is in line with demand indicators like 811 tickets and construction GDP, it indicates that we are not meaningfully reversing damage trends.
- Telecommunications facilities (49%) and natural gas facilities (39%) remained the most frequently damaged infrastructure types, while water/sewer work emerged as the leading type of work involved in damages (24%), followed closely by telecom/cable TV (23%).

Persistent Root Cause Patterns Reveal Sector-Specific Challenges

- The top ten root causes accounted for 85% of all damages, demonstrating remarkable year-over-year consistency reflecting deeply entrenched issues across the damage prevention process.
- Analysis of the top 10 root causes by work performed reveals that utility work dominates when damages occur, with water/sewer and telecom/cable TV emerging as having an outsized impact compared to natural gas and electric work.
- Root cause distribution spans all major stakeholder groups — notification failures (26%), locating practices (34%) and excavation practices (33%) — confirming that meaningful progress requires coordinated action from all stakeholders, not incremental improvements from individual sectors.

Unpredictable Locate Timing Continues to Impact Damage Prevention

- Analysis of data from eight 811 centers revealed that excavators faced an average 38% chance of being unable to begin work as scheduled due to locate requests with incomplete responses.
- 811 centers that reported significantly higher on-time rates have active locating and positive response enforcement programs, suggesting this challenge is solvable through systematic regulatory approaches.
- Unpredictable locate delivery can affect excavator confidence in the 811 process, potentially contributing to our persistent top root cause — failure to notify 811.

DPI Insights Reveal What Separates High Performers

- The Damage Prevention Institute (DPI) peer review program, encompassing 58 excavation companies, identifies specific factors that correlate with superior safety performance: strong client relationships, comprehensive training programs and formal damage prevention protocols.
- DPI-accredited contractors experienced reductions in excavator-attributable damage rates from 2023 to 2024.
- DIRT data quality improvements continue, with the overall Data Quality Index rising to 71.7 for 2024 (including an average of 76 for DPI participants), enabling more precise analysis and targeted interventions.

The Path Forward Requires Systematic Change

- Despite documented success stories from past DIRT Reports and the Next Practices Initiative proving significant reductions are possible, national damage trends remain stubborn, indicating that voluntary adoption of Best Practices may be insufficient.
- Water/sewer and telecom/cable TV work's dominance in top root causes demand targeted, sector-specific interventions that address unique operational and policy challenges, including investments in public utilities and regulatory frameworks that balance deployment speed with safety.
- Predictable, enforceable standards across all stakeholders — not just excavators — may be necessary to break through the current plateau and achieve transformative change.

Recommendations for Breaking Through the Damage Prevention Plateau

With the CGA Index rising to 96.7 and root cause patterns showing remarkable persistence, we must fundamentally shift our approach from voluntary Best Practices adoption to consistent, enforceable standards and forward-thinking Next Practice innovation. The following recommendations are built on three critical insights from 2024: Enforcement works where implemented, utility work dominates nine of the top 10 root causes, and DPI peer reviews highlight specific factors that separate high-performing organizations from the rest.

Priority 1: Improve Locate Timeliness Across All Operators to Target Top Damage Root Cause

Unpredictability in excavators' ability to start work on time may contribute to our most persistent top root cause — failure to notify 811. Excavators cannot confidently or legally begin work until every affected facility owner/operator has responded to a locate request. Data collected from eight 811 centers revealed that an average of 38% of the time, excavators were delayed in beginning their work as the result of incomplete responses to their locate requests — so while some facility owner/operators are likely delivering timely locate rates much higher than others, the systemic nature of this problem creates issues with perceived reliability of the 811 process.

REGULATORS & POLICYMAKERS:

- Strengthen enforcement frameworks for all stakeholders and functions across the 811 process, including utility locate timeliness.
- Establish financial accountability mechanisms that protect excavators from costs incurred due to facility operator delays, similar to **New Mexico's approach** highlighted in the **2023 DIRT Report.**

FACILITY OWNERS:

- Restructure locator contracts to prioritize performance over cost, implementing "best value" procurement that rewards reliability and accuracy.
- Ensure that third-party excavator contracts prioritize 811 notification in addition to other excavation Best Practices.
- Invest in GPS-enabled locating technology with real-time map updating capabilities to improve both speed and accuracy.
- Share 811 ticket-level facility maps with excavators to improve these workers' ability to accurately avoid dig-ins to buried utilities.

EXCAVATORS:

- Prioritize proper use of 811 and commit to processes that limit over-notification.
- Report late locates to the 811 center for improved tracking, analysis and enforcement.

Priority 2: Target Water/Sewer and Telecommunications Dominance in Work Performed

The 2024 analysis reveals that utility work drives nine of the top 10 damage root causes, with water/sewer and telecom emerging as having broad issues across several practices. These sectors require specific interventions that address their unique operational and policy challenges.

WATER/SEWER UTILITIES:

- Address the water/sewer industry's lack of participation in damage prevention Best Practices by implementing specific contractor requirements focused on avoiding damages.
- Advocate for federal and state funding dedicated to comprehensive utility mapping programs, recognizing that outdated or incomplete maps drive damage incidents.
- Leverage **CGA's free Online Excavator Training modules** to educate excavators about key practices that prevent damages when performing water/sewer work.

TELECOM:

- Implement mandatory pre-construction coordination protocols providing advance notice to all utilities before major deployments.
- Improve contracts with third-party locators and installers to include adequate compensation for high-demand times of year and to accomplish key damage prevention practices like potholing (daylighting).
- Require damage prevention training on key practices that prevent damages when performing telecom work (potholing, respecting the tolerance zone, accurate locating).

REGULATORS & POLICYMAKERS:

- Remove 811 membership exemptions for operators traditionally not included, for example water/sewer.
- Establish dedicated funding streams for water/sewer mapping improvements as part of infrastructure investment programs.
- Leverage permitting processes for telecommunications installers to include mandatory damage prevention protocols.
- Develop strong liability and enforcement frameworks that account for the unique challenges each sector faces in damage prevention.

Priority 3: Scale Successful Programs Based on Damage Prevention Institute Findings

DPI peer reviews reveal that successful organizations share common characteristics: robust client relationships, comprehensive training programs and formal damage prevention protocols. These insights must be systematically scaled across the industry.

FACILITY OWNERS:

- Develop contracts that incentivize safe excavation practices rather than just speed and cost, modeled after the natural gas and oil contracts that DPI participants identify as most effective.
- Establish client safety culture requirements that influence contractor behavior, recognizing the direct correlation between customer expectations and excavation safety.
- Implement contractor evaluation systems that elevate damage prevention performance to the level of traditional business metrics.

EXCAVATORS:

- Establish structured damage prevention programs that cultivate a strong safety culture through comprehensive approaches to employee training, excavation damage risk management, incident investigation and corrective action, the 811 process, and data collection and analysis that support program improvement.
- Utilize **CGA's free Online Excavator Training modules** to supplement company-specific training, or when damage prevention training is not available.

Priority 4: Implement Systematic Enforcement Across All Stakeholders

The enforcement success demonstrated in select states must be expanded, with accountability mechanisms that address all stakeholders rather than focusing primarily on excavators.

REGULATORS & POLICYMAKERS:

- Establish enforcement programs that address not only excavators' responsibilities, but also facility owners' responsibilities in damage prevention (locating, mapping, positive response, and excavation work for installation and maintenance), creating balanced accountability across the damage prevention process.
- Implement collaborative enforcement models that combine penalties with technical assistance, following Massachusetts' improvement plan approach (documented in the **2023 DIRT Report**).
- Create transparent reporting systems that allow stakeholders to track enforcement effectiveness and outcomes.
- Require reporting of all damages to allow for more comprehensive analysis and targeted recommendations.

FACILITY OWNERS:

- Develop internal mechanisms for locators that create accountability for performance standards.
- Establish quality assurance programs for mapping errors and locate delays.
- Implement contractor oversight systems that ensure compliance with damage prevention requirements.

EXCAVATORS:

- Create internal accountability systems that track and respond to notification failures, clearance and potholing violations and procedural non-compliance.
- Establish client communication protocols that address damage prevention challenges proactively rather than reactively.
- Implement technology solutions that prevent common excavation practice failures through automated compliance systems.

Priority 5: Accelerate Data-Driven Decision-Making

The persistence of root cause patterns demands more sophisticated data analysis and response capabilities across all organizations.

ALL STAKEHOLDERS:

- Improve DIRT damage reporting to reduce unknown, catch-all and liability-focused submissions and increase the quality of root cause and work type data in particular.
- Participate in the DPI, where peer review and benchmarking programs identify organization-specific improvement opportunities and monthly damage and near-miss reporting enable rapid responses to emerging trends.
- Invest in practices, processes and platforms to improve efficiency, reduce communication friction and provide data that can be leveraged to reduce damages.

Introduction

As the damage prevention industry confronts the sobering reality of stalled progress in 2024, the need for comprehensive, data-driven analysis has never been more critical. The 2024 DIRT Report serves as the industry's premier resource for understanding underground utility damage trends, offering the only comprehensive national accounting and analysis of damages to buried infrastructure across the United States and Canada.

Additional Resources

- **Past DIRT Reports**
- **How We Handle Multiple Reports of the Same Event**
- **Near-Miss Analysis**
- **Next Practices Reports**
- **Technology Reports**
- **CGA White Papers**

This year's Report introduces troubling yet actionable insights derived from 196,977 unique reported damages and extensive analysis of 811 center operations, late locate challenges and learnings from the Damage Prevention Institute. Building upon the CGA Index introduced in 2023, this Report's three-year trending data analysis reveals both the persistent nature of our challenges and the correlation between damage levels and broader economic activity.

As in previous years, the **2024 Interactive Dashboard** and Report draw from voluntarily and confidentially submitted data from facility operators, contractors, locators, 811 centers, and state and federal agencies. This year's analysis benefits from continued improvement in data quality, with the overall Data Quality Index rising from 71.1 in 2023 to 71.7, while DPI participants achieve an even higher average of 76.

The 2024 data underscores a fundamental truth: Incremental improvements will not achieve the foundational change required to reach our 50-in-5 goal. With the CGA Index rising from 94.0 to 96.7 — further from our target — the window for course correction is rapidly narrowing. However, the innovative solutions emerging across our industry, from GPS-enabled

mapping technologies to collaborative enforcement mechanisms, demonstrate that dramatic improvement remains achievable.

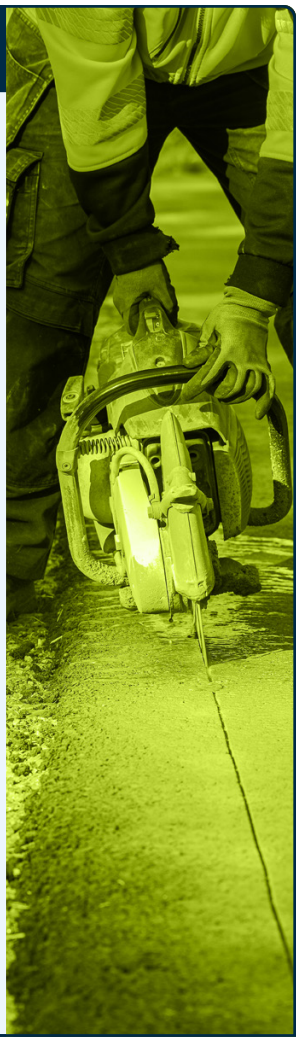
By leveraging the insights and recommendations contained in this Report, stakeholders across the damage prevention industry can contribute to the urgent investments our industry requires. The data provides the roadmap; the commitment to action will determine whether we achieve our collective goal of significantly reducing damages to underground infrastructure.

Spotlight on 2024 Data

Our analysis of 2024 data integrates damage reports entered into DIRT with 811 center information collected through CGA's One Call Systems International (OCSI) committee. For comprehensive breakdowns of facility types affected, work performed, equipment used, event sources, root causes and more, please refer to the **DIRT Interactive Dashboard**, which includes data from 2022 onward. The **811 Center Dashboard** offers detailed information on ticket volumes, trends and state-specific regulations and exemptions.

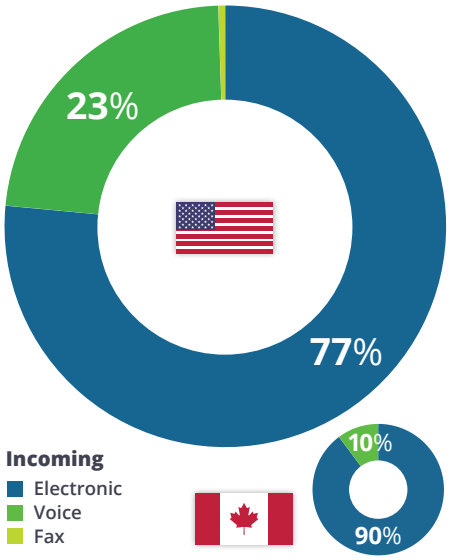
2024 Damage Data Highlights

- **There were 196,977 unique reported damages for 2024.** Unless otherwise noted, this is the basis for the numbers and percentages of the full dataset used throughout this Report and the online dashboard.
- **Excavation/construction stakeholders remained the top source of damage reports** for the third consecutive year.
  - About 18% of excavation/construction reports were from Damage Prevention Institute (DPI) participants.
  - About 74% of excavation/construction-sourced reports were submitted by 811 centers.
- **Telecommunication (49%) and natural gas (39%) facilities were again the leading reported facilities damaged,** with self-reporting as the leading event source for each.
- **Overall, water/sewer was the leading type of work involved in damages,** followed by telecom/CATV, construction/development and natural gas work.
- While **data quality** continues to improve, particularly from Damage Prevention Institute participants, it also remains a key area for enhancement.
- **A significant percentage of damages involve facility operators (or their contractors) damaging each other and themselves,** as indicated by the intersection of work type and facility damaged data.



Incoming Locate Requests / Outgoing Transmissions

Total Incoming	**43,533,423**	**2,352,101**
Electronic	33,447,167	2,132,590
Voice	10,079,850	242,016
Fax	6,406	0
Total Transmissions	**264,922,835**	**9,581,794**
Transmissions/ Incoming	**6.09**	**4.07**



811 Center Ticket Type
2024 Compared to 2023

Total Incoming	↑ 2.55%
Electronic	↑ 6.16%
Voice	↓ -9.69%
Total Transmissions	↑ 0.39%
Transmissions/ Incoming	↓ -2.21%

The shift from voice to electronic incoming tickets continues to accelerate. The decline in transmissions per incoming ticket indicates **improving efficiency in filtering which incoming tickets need to be transmitted** to facility operators, likely aided by electronic white-lining technology.

Total and Unique Damages and Near Misses in Canada and the United States

COUNTRY	Total Damage Reports	Unique Damages*	Total Near Miss Reports	Unique Near Misses*
UNITED STATES	221,858	189,052	2,382	2,115
CANADA	7,996	7,925	395	389
TOTAL	229,854	196,977	2,777	2,504

**Unique means accounting for multiple reports of the same event.*

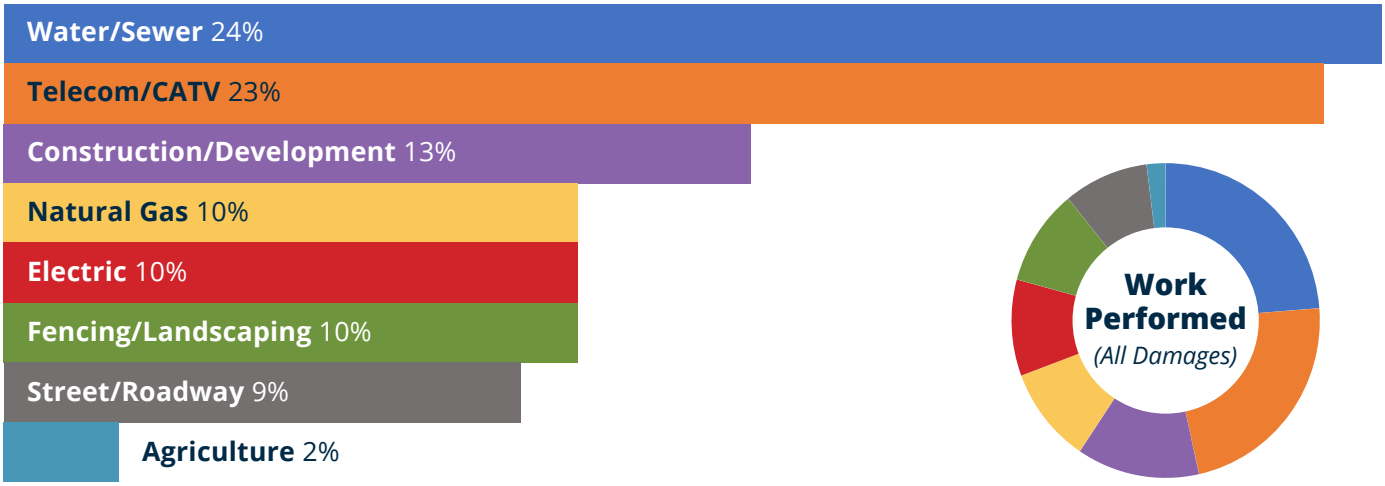
Utility Work Is Most Common When Damages Occur

Throughout this Report, we have consolidated the myriad options for "work performed" within DIRT into groups for broader analysis. The chart below details those groupings.

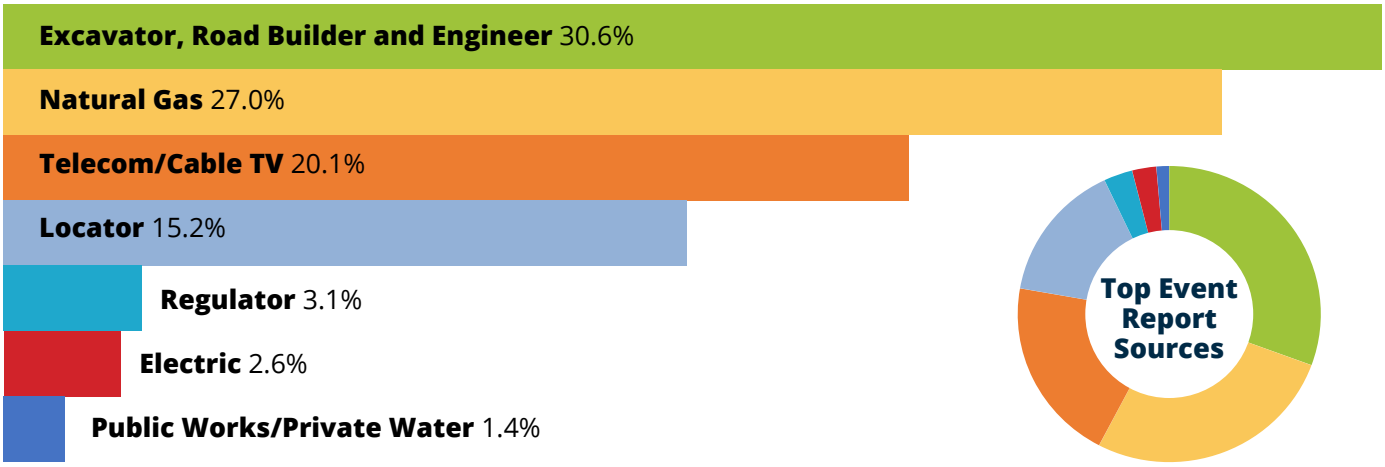
Work Performed Group	Work Performed Types*
Agriculture	Agriculture, Irrigation
Construction/Development	Construction, Demolition, Drainage, Driveway, Engineering, Grading, Railroad, Site Development, Waterway
Electric	Electric
Fencing/Landscaping	Fencing, Landscaping
Natural Gas	Natural Gas
Street/Roadway	Curb/Sidewalk, Milling, Pole, Public Transit Authority, Roadwork, Storm Drainage, Streetlight, Traffic Sign, Traffic Signal
Telecom/CATV	Cable TV, Telecommunications
Water/Sewer	Water, Sewer
Utility Work	Electric, Natural Gas, Cable TV, Telecommunications, Water, Sewer

** Liquid Pipeline and Steam were negligible.*

Work Performed: All Damages



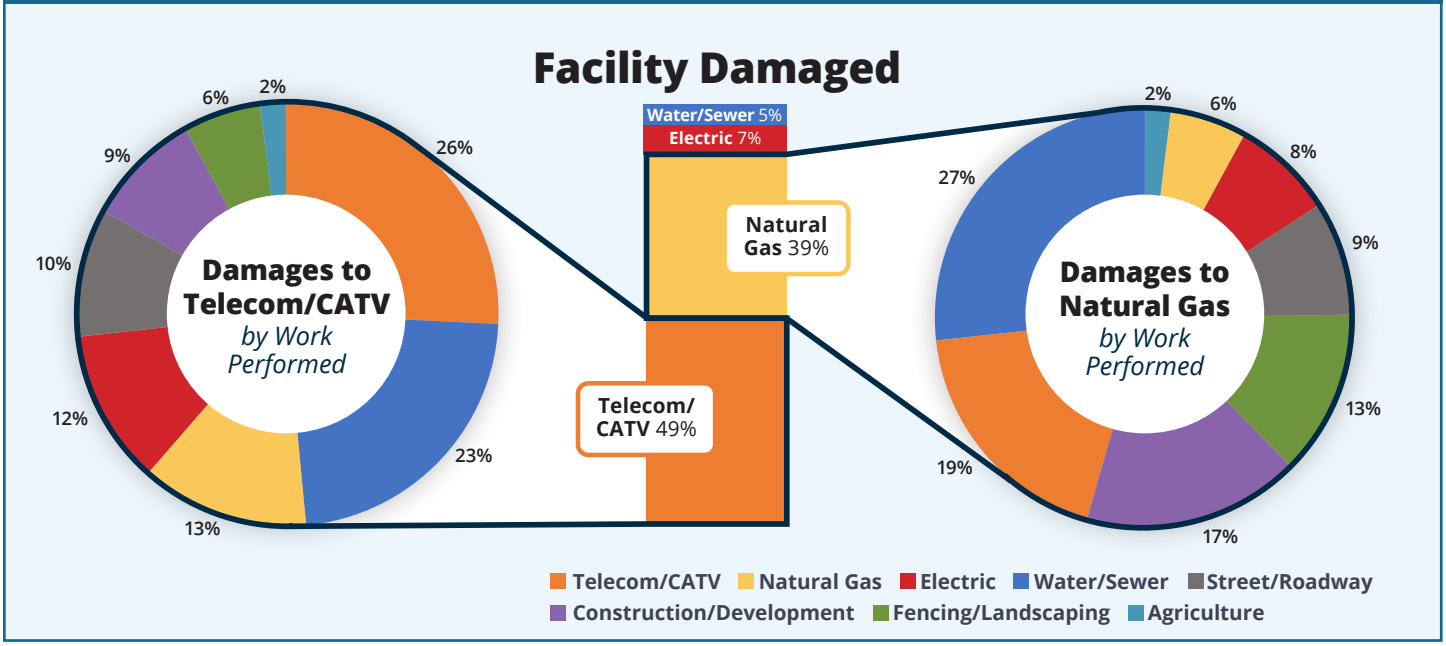
Top Event Report Sources



Consistent with previous years, **telecommunication and natural gas infrastructure represented the most frequently damaged facility types** at 49% and 39% respectively. Although self-reporting by facility operators remained the dominant source for both categories, a notable pattern emerged in reports from other sources: **Telecom/cable TV damages showed significantly higher rates of reporting from both excavators and locators** compared to natural gas incidents, with more than double the percentage contributions from these external sources (see chart).

Event Source	Facility Damaged	
	Natural Gas	Telecom/ CATV
Natural Gas	68%	<1%
Telecom	<1%	43%
Excavator	**15%**	**32%**
Locator	**9%**	**21%**

Facilities Damaged by Work Performed



Data Quality Index Improvements

The Data Quality Index (DQI), which scores the completeness of reports submitted to DIRT, continues to demonstrate its value as both a measurement tool and catalyst for meaningful improvements in damage prevention reporting. While we observe progress in the industry's overall DQI over time, it is also clear that sustained efforts across organizations to enhance data completeness and accuracy are necessary.

Data Quality Index (DQI) of Full Dataset

2021	+2.3	2024
69.4		71.7

Real-World Impact: NC811 Success Story

The **2023 DIRT Report** documented North Carolina 811's (NC811) remarkable progress in improving its DIRT DQI scores, demonstrating a pathway for industry improvement. Through targeted process enhancements — implementing dropdown menus for DIRT root causes and training customer service representatives to capture and enter this information — **NC811's DQI rose nearly 30 points over just two years.** Unknown root causes dropped from nearly 100% to around 8%. This intentional DQI improvement enabled NC811 to analyze

damages associated with locating practice errors and generate actionable insights for the industry, both regionally and nationally.

Advancing Root Cause and Work Type Precision

To further drive DQI improvements, **CGA's Data Committee developed an interactive flow chart** that guides users toward more specific root cause classifications. This tool aims to move the industry beyond catch-all categories like "locator error" and "improper excavation" to reveal the specific underlying issues requiring attention. By identifying a deeper root cause — defined as the point where a behavioral change could reasonably lead to a different outcome — organizations can identify controllable factors and systematically improve their damage prevention programs.

The **Data Committee is also addressing work type classification**, which consistently shows a very high percentage of unknown entries, which limits the ability to tailor outreach to specific stakeholder groups. Collaborating with OCSI, the Committee developed a **comprehensive mapping tool** that connects common work type descriptions from 811 tickets to standardized DIRT classifications. While DIRT currently offers 30 work type options, some 811 centers maintain hundreds or thousands of free-text variations describing the same work. This standardization tool helps 811 centers — and all stakeholders — adopt consistent classifications, improving data quality and enabling more targeted damage prevention efforts for distinct contractor groups.

Root Cause Analysis: Utility Work Dominates

DIRT captures detailed root cause information through 25 established categories alongside an "unknown/other" designation. The CGA Data Committee groups related causes into four broader classifications — Locating Practices, Excavation Practices, No Locate Request, and Invalid Use of Request by Excavator — to facilitate macro-level trend evaluation. By excluding "unknown/other" entries, the analysis concentrates on known breakdowns throughout the damage prevention process.

This year's Report expands the analysis by examining the **top 10 individual known root causes by work performed**, providing targeted insights for addressing the primary drivers of damage. This work-type analysis reveals that **utility work dominates** 9 of the 10 leading root causes, with **water/sewer and telecommunications work particularly prominent among the highest-risk categories.** This granular approach enables more precise recommendations for stakeholder-specific damage prevention strategies.

Click here to view definitions of damage root causes.

Root Cause Analysis Highlights

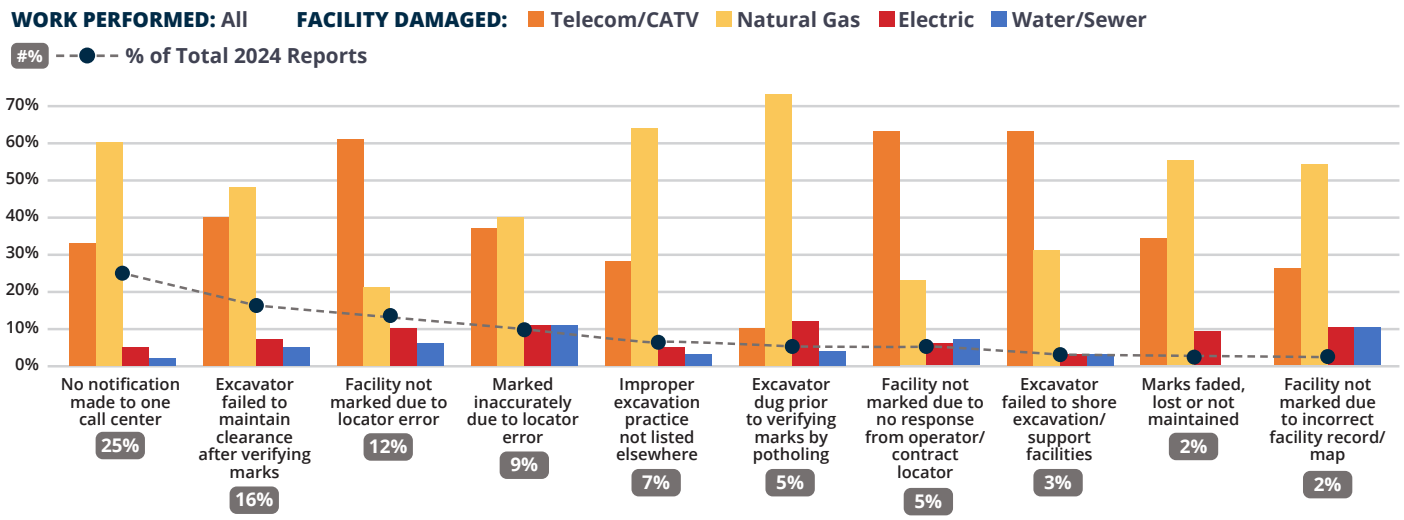
- **Root causes remain consistent year-over-year**, as demonstrated by minimal changes between 2023-2024 in individual root cause analysis. (Additional analysis of root causes over time can be found in the next section of this Report.)
- **The top ten root causes (out of 25) accounted for nearly 85% of all damages.** The root causes ranked 3, 4 and 5 can be considered "catch-alls" that likely mask other better-defined root causes, while the remaining top 10 root causes provide clear targets for damage prevention improvement efforts.
- **Utility work accounts for a disproportionate share of damages across nearly all root causes**, with water/sewer work leading in 6 of the top 10 categories and telecom/CATV work consistently ranking highly, highlighting the urgent need for sector-specific interventions in locating, mapping and excavation protocols.
- **Non-utility work drives the industry's top root cause**, with fencing/landscaping (28%) and construction/development (24%) leading in failure to notify 811 (the top damage driver in 2024 and every year), while construction work also shows concerning patterns in excavation practices including failure to pothole, protect/shore/support and maintain marks.
- **Locate requests with incomplete responses leave excavators unable to begin work as scheduled an average 38% of the time** (excluding emergency work and long-term "project tickets"), based on data from eight 811 centers. Based on DPI peer reviews, this lack of predictability in locate timeliness may undermine excavators' confidence in the 811 process and likely perpetuates over-notification and notification failures, which is particularly impactful given that areas with active locating and positive response enforcement demonstrate better on-time rates.

2024 Top 10 Individual Damage Root Causes (Excluding Unknown)

Rank	Root Cause	2024 Reports	% of Total	2023 Comparison
1	No locate request	35,402	24.54%	↓ -1.69
2	Excavator failed to maintain clearance after verifying marks	23,183	16.07%	↑ 0.95
3	Facility not marked due to locator error	17,220	11.94%	↓ -2.49
4	Marked inaccurately due to locator error	12,378	8.58%	↑ 1.35
5	Improper excavation practice not listed elsewhere	9,731	6.75%	↓ -1.45
6	Excavator dug prior to verifying marks by potholing	7,129	4.94%	↑ 0.33
7	Facility not marked due to no response from operator/contract locator	6,795	4.71%	↑ 1.37
8	Excavator failed to shore excavation/support facilities	4,710	3.27%	↑ 0.38
9	Marks faded, lost or not maintained	3,133	2.17%	↓ -0.15
10	Facility not marked due to incorrect facility record/map	3,121	2.16%	↑ 0.20
	Total Top 10	**122,802**	**85%**	

To view all 25 known damage root causes for 2024, visit **Appendix A** or the **2024 DIRT Report Toolkit**.

Top 10 Known Root Causes by Facility Damaged



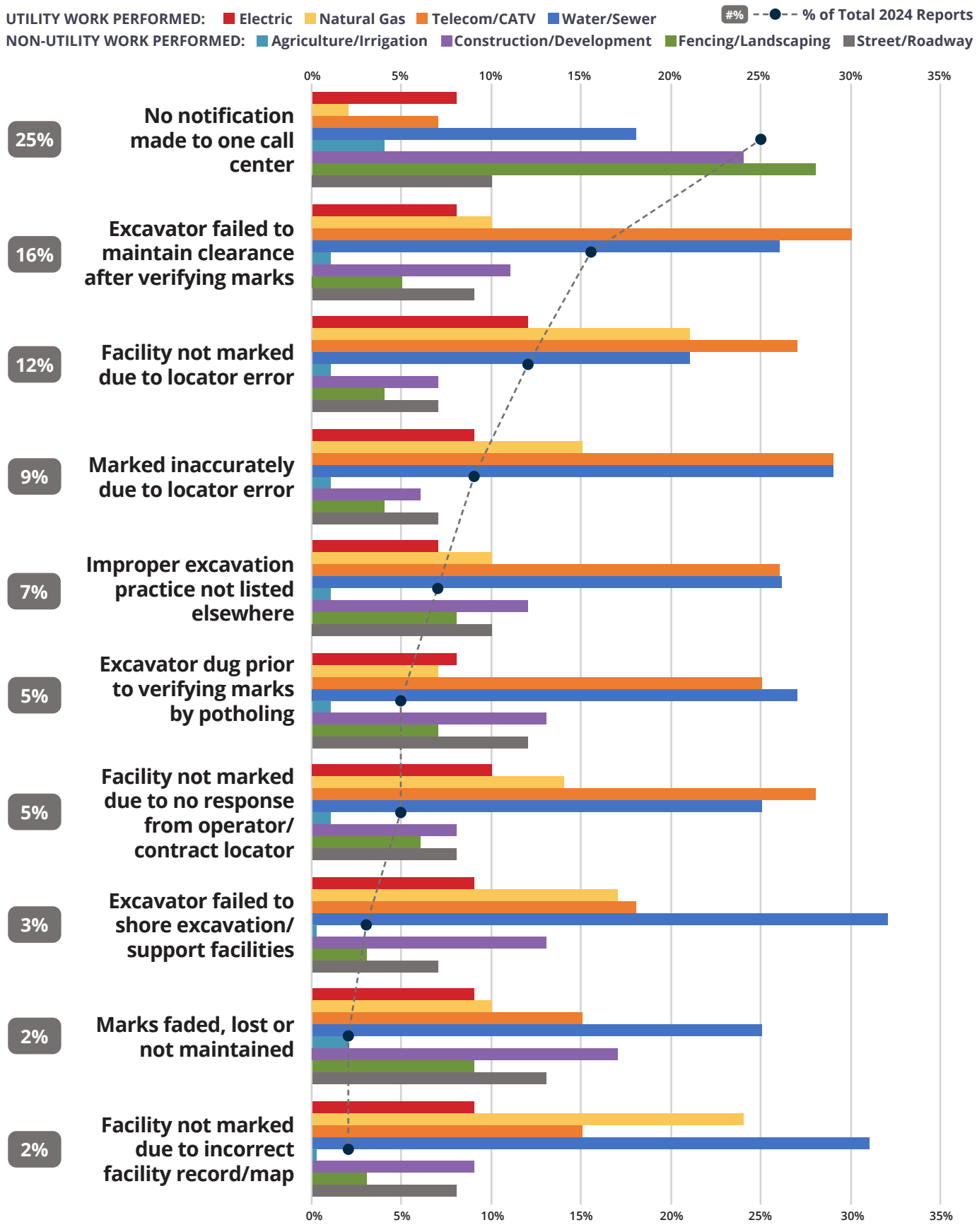
Work-Specific Root Cause Patterns Reveal Targeted Intervention Opportunities

The top 10 known root causes by work performed reveal clear patterns that demand sector-specific attention. **Utility work dominates damage incidents across nearly all root causes**, with water/sewer and telecom/cable TV work consistently ranking as highest contributors to the leading root causes. This pattern underscores the urgent need for targeted interventions in utility operations, particularly given that these damages often involve facility operators (or their contractors) damaging each other's infrastructure or their own facilities during maintenance and installation activities.

Water/sewer work emerges as problematic across the board, eclipsing all other utility work in damages resulting from failure to notify 811 (18%) in addition to dominating six of the top 10 root causes. The consistency of this work type across the diverse range of root causes suggests systemic challenges that span multiple functions — from insufficient excavation protocols during utility installations and repairs to inadequate mapping and locating practices. This sector's limited adoption of damage prevention practices compared to other utility categories demands both targeted outreach and structural solutions to address underlying challenges.

The foundational mapping challenges facing water/sewer systems present significant barriers to effective damage prevention. The majority of water and sewer systems are publicly owned and operated, often at the municipal level, where resource constraints may mean hiring contractors with less access to comprehensive damage prevention training and limiting investment in comprehensive facility mapping and 811 system participation. CGA Next Practices case studies have documented successful approaches, including leveraging free trials of **GPS-enabled locating devices to help municipalities and public works departments build, improve or "heal" their facility maps** while meeting locating demand.

Top 10 Root Cause Distribution by Work Performed



However, many systems lack the foundational mapping infrastructure necessary for efficient locating, creating a cycle where inadequate records lead to poor locate quality and increased damages.

Regulatory gaps compound these challenges, as evidenced by recent events in Katy, Texas, **where fiber installation projects damaged 16 water lines in six months because, while excavators were required to contact 811 before digging, the water utility was not fully participating in the coordinated marking system, resulting in unmarked water lines in easements.** This reinforces the need for comprehensive legislative and regulatory frameworks that ensure compliance with damage prevention processes for water/sewer systems for work performed and as an owner/operator of these facilities.

The **Damage Prevention Action Center** is actively engaged in state-level discussions to address these gaps, including advocacy in Texas for "Class B" facilities like water systems to participate fully in the 811 process, and addressing challenges in states like Kentucky that lack mandatory 811 center membership. While **PHMSA** requires municipal gas pipeline operators to be members of 811 centers, PHMSA does not have the statutory authority to require municipal water/sewer utilities to be members of 811 centers. Implementation gaps and funding constraints for municipalities continue to create vulnerabilities that **require coordinated policy solutions**.

Telecommunications/CATV work presents a similarly concerning profile, rising to the top in most root cause damage categories and particularly prominent in locating-related failures. The high rates of telecom-related damages in marking accuracy (27%) and facility identification (26%) align with findings from **CGA's Telecom White Paper** and other industry analysis indicating that rapid deployment schedules and an acceptance of damages as the "cost of doing business" may compromise thorough damage prevention practices. In addition, interviews with DPI contractors suggest that some companies pass the cost of repairing facilities that were not located or marked onto the excavators who damaged them. This behavior can improperly place the financial burden of damage prevention solely on excavators.

Natural gas work, while demonstrating the benefits of established regulatory frameworks and stronger damage prevention practices, still shows notable areas for improvement. Natural gas work shows higher rates than non-utility work in locator-related failures, including no response from contract locator and facility not marked due to incorrect facility maps. While the natural gas industry's regulatory requirements have clearly fostered stronger contracts and protocols with second- and third-party excavators and locators compared to other utility sectors, these data points indicate opportunities to further strengthen mapping accuracy and locating service reliability.

Electric work maintains relatively lower damage rates across most categories, suggesting that established safety protocols and regulatory frameworks are effective. However it is important to note that this is a utility type with a large amount of overhead assets and fewer submitted damage reports overall.

Non-utility work leads the top damage root cause (failure to notify). Fencing/ landscaping work leads the "no locate request" category (28%), followed by construction/

development work (24%), demonstrating that excavators in these sectors — despite being required to notify 811 — represent substantial opportunities for education and compliance improvements. Beyond notification failures, construction/development and roadway work show room for improvement in excavation practices, ranking high in failures to verify marks by potholing, inadequate shoring and facility support and protection, and failure to maintain locate marks. These patterns suggest that non-utility contractors could benefit from enhanced training and protocols around safe excavation practices once locates are provided.

These work-specific patterns demonstrate that effective damage prevention requires tailored approaches recognizing the unique operational challenges, regulatory environments and frameworks for engaging with contractors. The dominance of utility work in damage incidents, combined with significant non-utility contributions spanning both notification and excavation practice failures, confirms that breakthrough progress demands coordinated action across all sectors with an urgent focus on utility-on-utility damages.

Locate Requests With Late Responses Undermine System Confidence

Timely and complete responses to locate requests are fundamental to the reliability of the damage prevention process. When even one utility fails to confirm markings or clearance, projects stall, costs rise and excavators' confidence in the process is affected.

Building on findings from prior DIRT Reports as well as analysis of top root causes by work performed, CGA's One Call Systems International (OCSI) Committee continued to examine the persistent challenge of late locates.

This year's updated locate request survey focused exclusively on *standard excavation tickets** to better understand how often excavators are unable to begin work as scheduled for routine, code-compliant requests. A single locate request may require responses from multiple facility operators. If even one utility fails to post a **positive response** confirming that facilities are marked or the site is clear, the excavator cannot confidently or legally proceed. To learn more about CGA and OCSI's late locate methodology, **click here to view Appendix B**.

Survey Scope and Methodology

To ensure consistency, the survey collected both 2023 and 2024 "on-time" and "not ready" data for standard excavation tickets.*

Seventeen 811 centers participated. Of these, eight centers representing 16% of U.S. ticket volume, use **mandatory positive response systems** and were able to provide incoming **ticket-level data** indicating whether all utilities on the ticket had responded by the legal deadline. The remaining nine centers were currently only able to provide transmission-level data, which does not enable determination of whether an excavator could begin work on the specified date.

**Standard/normal excavation tickets exclude emergency tickets (less than standard response time) and special tickets allowing extended time frames (e.g., large projects, subaqueous, survey/design). This limitation to standard tickets created more consistent reporting across centers with differing ticket categories.*

Locate Requests with Late Responses				
Year	Locate Request Volume	Weighted Average	Median	Range
2023	6,595,549	38%	36%	8%–80%
2024	6,830,324	38%	35%	6%–73%

Weighted average *= Total requests with late responses for all eight centers ÷ total incoming requests for all eight centers*

Median *= Middle value of center percentages for locate requests with late response*

Locate Requests with Late Responses by 811 Center		
811 Center	2023	2024
A	8%	6%
B	18%	16%
C	30%	28%
D	35%	45%
E	36%	34%
F	36%	36%
G	40%	45%
H	80%	73%

Ticket-Level Survey Results

Analysis of data from eight 811 centers shows that excavators were delayed an average of 38% of the time when requesting standard locating services. However, on-time rates varied considerably across geographies, ranging from single-digit delays to over 70%. While this wide variation demonstrates that some regions achieve strong performance, it is also important to note that **any late response rate above zero can disrupt the damage prevention process**, since excavation may not confidently or legally begin until all utilities have responded. This means that even a single late or missing locate can delay an entire project, and that the performance of all operators **affects excavator perceptions of the damage prevention system — regardless of how well individual operators may perform**.

The impact of incomplete responses appears to be increasing. The damage root cause "facility not marked due to no response from operator/contract locator" increased from 3.3% in 2023 to 4.71% in 2024 — suggesting that excavators may be beginning work with incomplete responses at a higher rate. **CGA's 2023 Industry Survey** reinforces this concern, finding that "facilities not marked" was identified as the biggest challenge to the damage prevention industry by the majority of respondents.

While late locate rates vary widely across regions, there are clear indicators for what drives better on-time performance. Centers that reported notably **better on-time performance have active locating and positive response enforcement programs**. The **2023 DIRT Report** profiled enforcement models in New Mexico and Massachusetts that may serve as models for regions seeking to improve their on-time rates.

Looking ahead, addressing this issue industry-wide requires identifying efficient and clear ways of quantifying the impact on damage prevention. OCSI's ongoing work has been instrumental in building consensus on how to measure and report late locate metrics. The Committee's efforts to develop and evolve reporting methods will be essential for better understanding the impacts of locate requests with incomplete responses across different regions and creating the foundation for improvements. **Appendix B** details the methodology CGA and OCSI used for this analysis.

> These root cause patterns, combined with the persistent challenge of unpredictable locate delivery, demonstrate that damage prevention obstacles remain deeply entrenched across multiple stakeholder groups and work categories. The consistency in these challenges over time underscores the need for comprehensive, long-term strategies that address both immediate operational failures and systemic issues.

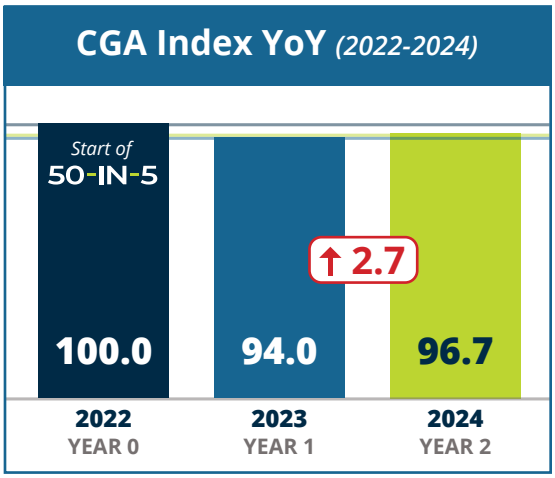
Three-Year Trending: CGA Index and Root Causes

The **CGA Index**, first introduced in the **2023 DIRT Report**, provides a resilient model for trending U.S. damages over time. For 2024, the CGA Index rose slightly from 2023, indicating an overall plateau in progress toward reducing damages to buried utilities. Combined with other economic and industry data — including root cause analysis over time — three-year trending reveals that damages continue to track with excavation activity levels rather than demonstrating the systematic improvements necessary to achieve transformative damage reduction.

Key Three-Year Trend Highlights

- **The CGA Index provides a resilient, comprehensive year-over-year model** for evaluating damage prevention progress in the U.S. **The 2024 score rose nearly 3 points from 2023, indicating backsliding** on the path toward the 50-in-5 goal, requiring renewed focus and effort from all stakeholders.
- **The persistent correlation between excavation activity and damage levels reveals that current damage prevention approaches have not achieved the systemic improvements necessary** to decouple damages from construction volumes, emphasizing the need for scalable strategies and enforcement mechanisms that maintain effectiveness regardless of excavation activity levels.
- **Root cause patterns show notable consistency over the three-year period**, with the largest shift for any major root cause group changing by only 2 percentage points.

Consistent with previous DIRT Report trend analysis, the annual Index calculation utilizes a dataset of reports from companies who have submitted for three or more consecutive years. This **consistent reporters dataset** includes a representative sample of DIRT contributors from 2022-2024, encompassing facility owners/operators, 811 centers, locators, excavators, public and private water utilities, and regulatory agencies. **Focusing on consistent reporters provides a more accurate assessment of damage trends over time** while minimizing the impact of fluctuations in voluntary reporting patterns that could skew year-over-year analysis.



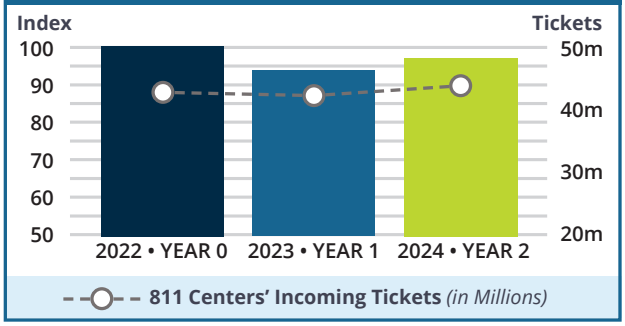
The CGA Index trends damages to buried utilities by leveraging known patterns to model damages at the county level, where **reliable public datasets provide more consistent modeling than state or regional options**. As detailed in the **2023 Report**, extensive analysis revealed that the combined presence of three variables emerged as the most reliable predictors of underground utility damages at the county level: number of industry-relevant companies, degree of urbanicity, and amount of precipitation.

Index Correlation with Digging Activity

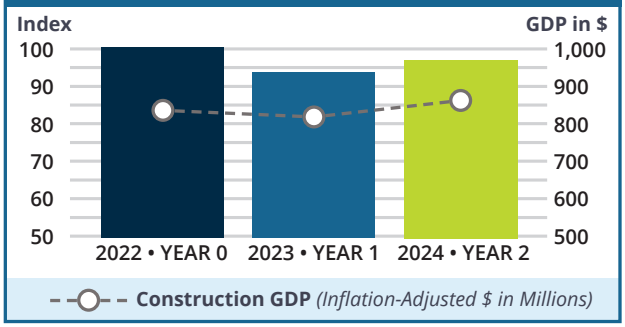
The three-year CGA Index trend demonstrates a strong correlation with broader economic indicators, revealing predictable patterns that underscore both challenges and opportunities for the damage prevention industry. **The Index trend line closely mirrors construction activity indicators and 811 incoming ticket volumes**, where increased excavation activity consistently aligns with higher damage rates.

The predictable relationship between excavation activity and damages represents a fundamental challenge for the industry: It highlights that our current damage prevention approaches have not yet achieved the systemic improvements necessary to decouple damage rates from excavation volumes.

CGA Index & 811 Tickets



CGA Index & Construction GDP



Variables Indicating Damages

Together, these variables are the strongest indicators of likely damage levels in a county:

Number of relevant companies:
U.S. Census Bureau data indicates the county-level presence of companies relevant to damage prevention, including utilities, construction, landscaping, engineering and others.

Degree of urbanicity:
Scale of one (most urban) to nine (most rural) utilized by the United States Department of Agriculture's (USDA) Economic Research Service to classify counties using population size and adjacency to metro areas.

Amount of precipitation:
County-level data sourced from the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center.

Annual CGA Index Score

Generating the annual CGA Index score:

- Classify U.S. counties based on urbanicity, number of relevant companies, amount of precipitation for a given year.
- Establish consistent reporting company dataset for trending.
- Determine 80th percentile of DIRT-reported damages for each county classification group for a given year.
- Calculate modeled damages for each group by applying the 80th percentile value to each county in the group.
- Add 80th percentile values from all county groups and divide by the same value for the year prior, and convert to a 100-point scale.

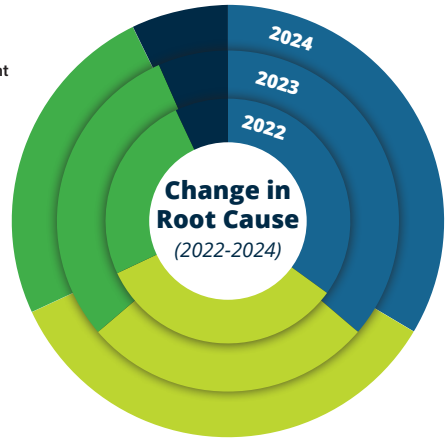
For detailed information about the CGA Index calculation, visit ***Appendix C****.*

Damage Root Causes Over Time

Earlier in the Report we looked at the top 10 damage root causes for 2024 individually, but here we examine groupings of related causes — Locating Practices, Excavation Practices, No Locate Request, and Invalid Use of Request by Excavator — across all 25 possible options to again reveal remarkable consistency over the period of 2022-2024.

Root Cause	2022*	2023*	2024*
Locating Practices	33%	34%	34%
Excavation Practices	35%	33%	35%
No Locate Request	27%	27%	25%
Invalid Use of Request by Excavator	6%	6%	7%

*Consistent reporters dataset



Whether comparing the three years of consistent reporters, or 2024-full dataset versus 2024-consistent dataset, **the largest shift for any root cause group is 2 percentage points**. The roughly equal presence of each major root cause group (excluding "Invalid Use of Request by Excavator") underscores that all stakeholders have a role to play in taking ownership of the damage prevention practices that are under their control.

The consistency of damage trends and root causes over time — and their correlation with external and semi-external factors like precipitation and construction GDP — emphasizes the urgent need for scalable damage prevention strategies that **are effective regardless of excavation activity levels**. As an industry, it is imperative that we make progress toward safe and uninterrupted utility service even during periods of robust economic growth and infrastructure expansion.

Damage Prevention Institute: Building Industry Accountability

The **Damage Prevention Institute (DPI)** continues to strengthen CGA's data collection and standardization efforts through mandatory monthly DIRT reporting and stakeholder-specific damage prevention metrics, fostering shared accountability among industry participants and charting the course for the future of damage prevention. Beyond enhanced data collection, the DPI builds industry accountability through a comprehensive peer review process that identifies specific factors distinguishing high-performing organizations, and provides insights for driving improvements across the industry.

DPI Highlights

- **DPI participants demonstrate higher data quality through structured reporting protocols**, achieving a combined DIRT DQI score of 76—nearly 4 points higher than the overall 2024 score — while providing more consistent and actionable damage prevention data for industry analysis.
- **Most DPI-accredited excavators achieved damage rate reductions from 2023 to 2024.**
- **Peer review insights reveal that training programs, safety culture, technology adoption, proper contract structures and data management practices serve as key differentiators** between high-performing damage prevention organizations and those struggling with persistent challenges.

Damage Rates Declined for Excavators

The damage rate (excavator-attributable damages per 10,000 work hours) declined by over 6% from 2023 to 2024. Evidence from DPI peer reviews reveals that reductions in damage rates can result from a variety of factors, including:

- Improved damage prevention practices, such as better pre-job planning, use of soft digging technology, potholing, or improvements in excavation practices like hand digging.
- Improved workforce behavior through training programs and hiring more experienced crews.
- Use of better technologies like GIS, utility locating tools, and data management and analysis systems.
- Greater 811 process compliance, such as improved ticket and positive response management.
- Improved internal reporting and accountability through the DPI, employee performance management and root cause analysis.

6% Damage Rate* Decline

from 2023-2024

***Excavator-attributable damages per 10,000 work hours**

- Stricter contractor or client requirements.
- Changes in reporting to the DPI, such as more accurate tracking of work hours and/or stricter criteria for what qualifies as a damage.

Peer Reviews Provide Evidence-Based Insights

As demonstrated by the damage-reduction related insights shared above, the peer review component of the DPI represents a **collaborative approach to damage prevention improvement**, facilitating confidential conversations between excavation companies of varying sizes and geographic locations to identify both best practices and persistent challenges. These structured discussions reveal critical insights about the operational, cultural and contractual factors that influence damage prevention performance, **providing evidence-based guidance for industry-wide improvement efforts**.

With 58 excavation companies having participated in peer reviews, the program has generated valuable information about what separates successful damage prevention programs from those struggling with ongoing challenges:

Excavator Damage Prevention Programs

- **Resource constraints, including training:** Smaller companies (1-50 employees) lack resources to develop formal, fully documented damage prevention programs and training that align with company culture, customer requirements and prevailing root causes. CGA's resources, including our free **Online Excavator Training**, can support these companies, as well as those managing the ongoing challenge of employee turnover, in advancing their goals.
- **Relationship impact:** Positive relationships between excavators and clients significantly influence excavator safety culture. Companies engaging in damage prevention conversations with clients and other companies have stronger damage prevention programs.
- **Documentation challenges:** Some companies face resource constraints when investigating damages, leading to inadequate incident documentation and liability risks for excavators.

Risk Management

- **Data tracking benefits:** Companies tracking damage and near-miss data demonstrate stronger damage prevention programs (e.g., they use data to identify root causes and target employee training requirements accordingly).
- **Contracts vary by industry and impact risk:** Customer culture directly drives excavation safety culture. For example, natural gas pipeline operators tend to have more robust damage prevention programs due to industry regulations and general safety culture – as a result, contractors working for natural gas pipeline operators are expected to adhere to operators' advanced safety protocols, which drives improved damage prevention safety culture in those contractor companies. Conversely, contractors believe telecommunications and municipal contracts do not effectively encourage safe digging practices in many cases.
- **Economic pressures compromise safety decisions among smaller contractors:** Small contractors often accept riskier contracts with inadequate safety requirements because they need the work to maintain business viability. This economic vulnerability allows utilities and large contractors with poor damage prevention cultures to exploit smaller companies, leading to compromised safety standards. Addressing this dynamic requires utilities and prime contractors to prioritize safety in their procurement processes rather than focusing solely on cost considerations.
- **Access to facility mapping significantly improves excavation safety:** Contractors with access to facility maps report higher confidence in their excavation activities and demonstrate better damage prevention outcomes. However, mapping access varies dramatically across utility types and geographic regions, with some contractors receiving detailed GIS data while others work with outdated map information or none at all. The disparity in mapping quality and accessibility creates unequal safety conditions that affect both contractor performance and liability exposure, highlighting the need for standardized mapping requirements and data sharing protocols across all utility sectors.

Systemic Damage Prevention Challenges

- **Confidence issues drive notification failures:** In peer reivews, contractors report lacking confidence in the 811 process due to late locates. This erosion of trust creates a cycle where unpredictable locate delivery encourages contractors to over-notify in hopes of getting locates on at least some tickets, which can strain system resources.
- **State 811 program inconsistencies create operational confusion:** Variations between state 811 programs—including different notification requirements, response timeframes and exemption categories—create significant challenges for contractors operating across multiple jurisdictions. These inconsistencies force companies to maintain different protocols for different states, increasing complexity and potential for compliance errors.
- **Positive response system misuse undermines excavator planning:** Inappropriate use of positive response codes by locators and facility operators obscures what are simply late locates, leading to project delays and safety risks when excavators arrive on-site. This misuse particularly affects contractors with tight schedules who rely on accurate response information for crew deployment and project planning.

Data Management and Accountability

- **Data collection gaps limit improvement opportunities:** Most contractors lack systematic approaches to collecting and managing damage and near-miss data, preventing them from identifying patterns, targeting training needs or demonstrating safety performance to clients. Without consistent data collection, companies cannot establish baselines for improvement or track the effectiveness of damage prevention investments.
- **DPI framework enables data-driven decision making:** The DPI serves as a valuable tool for collecting, managing and analyzing damage prevention data, providing participating companies with standardized metrics and benchmarking capabilities. Companies utilizing DPI data management tools demonstrate stronger damage prevention programs and more effective root cause analysis compared to those relying on informal or inconsistent tracking methods.
- **Internal accountability systems vary widely:** Companies with formal damage investigation protocols and corrective action processes show better long-term damage prevention performance, while those lacking structured accountability mechanisms struggle to break cycles of recurring incidents. The most successful organizations establish clear incentives and consequences related to damage prevention performance, while also providing support and training to prevent future occurrences.

DPI's data demonstrates that structured accountability, enhanced data collection and peer-driven learning can drive measurable improvements in damage prevention performance. While the findings reveal persistent challenges — from the higher damage rates among large companies to ongoing 811 process confidence issues — they also provide evidence-based guidance for targeted interventions across company sizes and industry sectors. As the DPI continues to expand its reach and refine its methodologies, the insights generated through reporting and peer reviews represent a critical foundation for the systemic, coordinated improvements necessary to achieve breakthrough progress in damage prevention.

There's more to uncover.

Visit the **DIRT Interactive Dashboard** to explore 2022-2024 damage data in-depth. Use the DIRT Explorer to filter data by geography, stakeholder group, facility damaged, equipment type and more. State- and province-level data is available as well.