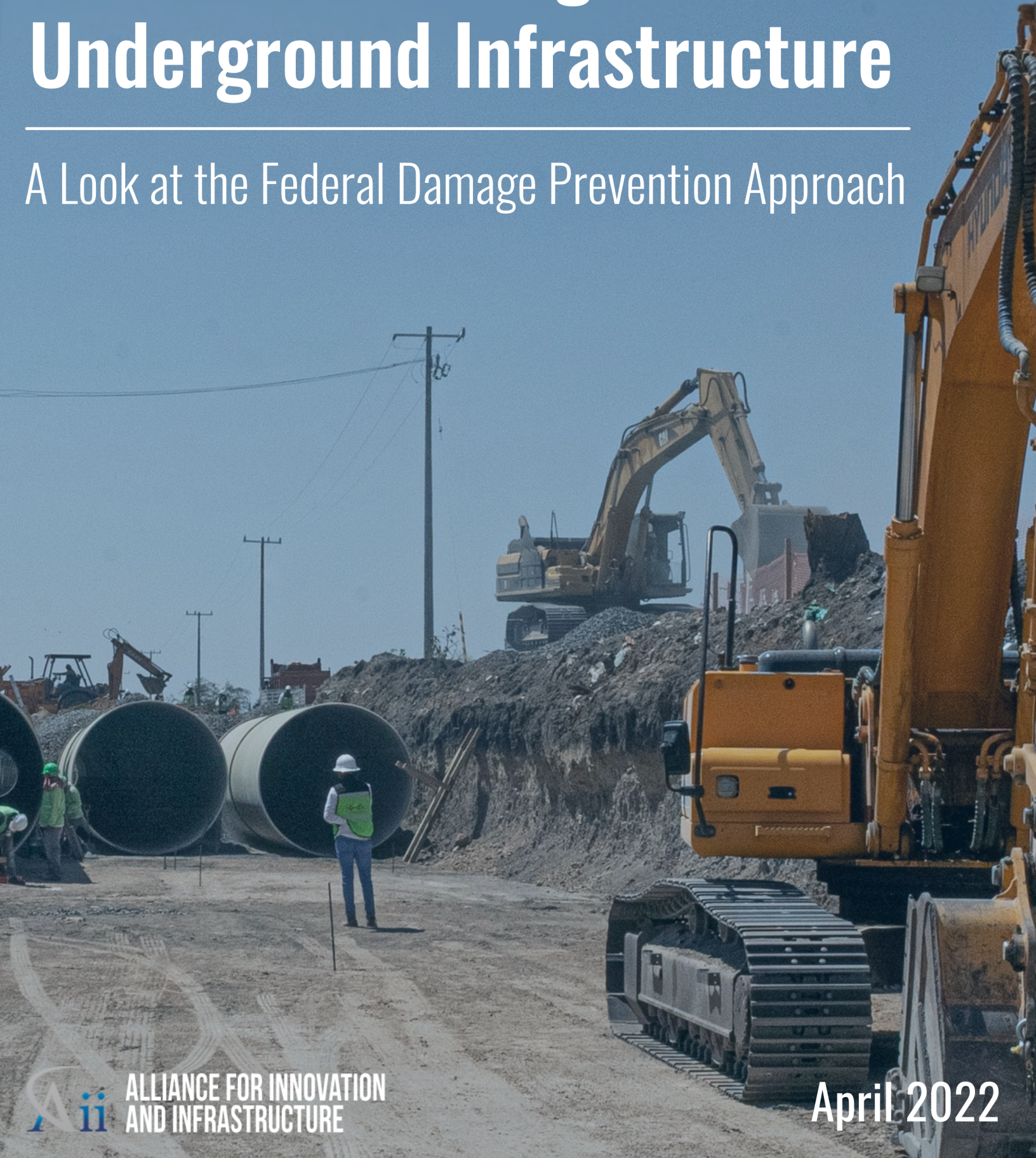


# Excavation Damage to Underground Infrastructure

A Look at the Federal Damage Prevention Approach





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## About Aii

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

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

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# Excavation Damage to Underground Infrastructure:

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### Executive Summary

Pipelines and buried utilities are facing an unprecedented threat from excavation damage across the United States, leading to economic harm estimated to exceed \$30 billion annually. The passage of the Bipartisan Infrastructure Law, which will infuse the economy with billions of dollars in construction spending, will add significant upward pressure to already rising excavation damage trends. The Pipeline and Hazardous Materials Safety Administration (PHMSA) is the federal authority tasked with overseeing damage prevention nationwide, but its relevant authority only covers around 10 percent of all buried infrastructure. Given rising damage trends, there is a clear gap in federal damage prevention oversight.

This report provides an overview of the authority and responsibility PHMSA has over damage prevention, including regulatory powers and grant making. After reviewing these programs and looking at recent damage trends, it asks whether the current federal approach is sufficient to reverse current damage trends and protect all types of underground infrastructure from excavation damage.

Congress and PHMSA should explore their authority and priorities to promote proven technology, improve damage prevention programming across the country, and ensure all underground infrastructure is protected from excavation damage. The best way to do this may be new rulemakings, elevated standards for existing programs or grants, or prioritizing allocation of resources toward implementation of innovative technologies.

# Excavation Damage to Underground Infrastructure:

## A Look at the Federal Damage Prevention Approach

### Introduction

Infrastructure in the United States faces a number of challenges ranging from wear and tear to climate impacts, but perhaps the least discussed threat to existing infrastructure comes from excavation damage related to construction. Every project that breaks ground puts at risk the millions of miles of underground pipes, cables, and wires powering and sustaining modern life – and in 2020 it was estimated that digging inflicts a considerable \$30 billion in economic damages annually.<sup>1</sup> Safeguarding this critical underground infrastructure is of national importance, especially as industry experts predict damage trends will continue to rise.<sup>2</sup>

*Damage prevention* is a national challenge facing communities in every state. Because damage to subsurface infrastructure occurs mostly as a result of construction activity, which generally falls outside of federal jurisdiction, prevention is primarily a local and state-level policy challenge. Each state has its own laws, regulations, and agencies to oversee damage prevention and excavation safety. With 50 states each regulating damage prevention, one may expect damage trends to differ widely, with certain states experiencing rising damage trends and others showing strong improvement. Yet what we see instead is a multi-year, nationwide trend of rising excavation damage.<sup>3,4</sup> Not only does the number of damage incidents appear to be increasing, but the costs associated with them are also rising – nationwide.<sup>5</sup>

The federal government provides some damage prevention oversight, primarily with respect to interstate natural gas and hazardous liquid pipelines. Specifically, the Pipeline and Hazardous Materials Safety Administration (PHMSA) has direct authority over these pipelines, which are at particular risk from excavation damage, and which pose significant risk to workers, the general population, and the environment if damaged due to their volatile payloads and high volume. Although focused on pipelines, PHMSA has a wide range of influence in the broader damage prevention space, such as by funding research, providing grants, and working with states and stakeholders to improve damage prevention practices that impact all underground infrastructure.

With that in mind, this paper provides an overview of PHMSA's federal damage prevention role and efforts. This will illustrate not only where the federal government offers damage prevention policy and resources, but also areas where federal authority is less robust, and asks whether the current federal approach is sufficient to reverse current damage trends and protect all types of underground infrastructure from excavation damage.

# The Pipeline and Hazardous Materials Safety Administration

## Agency Overview and Damage Prevention Jurisdiction

By 2004, the United States had over 2 million miles of pipelines and over a million daily shipments of hazardous materials through the nation's transportation systems. Pipeline safety had long been a challenge, and in particular, the issue of excavation damage. Throughout the 1990s, industry groups along with the National Transportation Safety Board (NTSB) had elevated addressing excavation damage to underground infrastructure as a key national priority. In response to this and other issues, Congress passed the Norman Y. Mineta Research and Special Programs Improvement Act of 2004 creating the Pipeline and Hazardous Materials Safety Administration (PHMSA) within the U.S. Department of Transportation.<sup>6</sup>

As an operational agency engaged in overseeing the movement of hazardous materials nationwide by land, sea, and air, PHMSA has taken a more active role than other agencies that merely set policy. PHMSA's jurisdiction over the movement of hazardous materials nationwide includes a particular focus on pipelines. With the greatest threat to pipelines coming from excavation damage, PHMSA became the principle federal authority for damage prevention to underground infrastructure.

Leading damage prevention from an agency that only has jurisdiction over a portion of the total at-risk infrastructure has limitations when it comes to the protection of other underground infrastructure. PHMSA oversees around 2.8 million miles of pipeline, while the total linear measure of all underground pipes, cables, and wires in the U.S. exceeds 20 million miles.<sup>7,8</sup> Although excavation damage to pipelines presents the greatest cost and risk relative to other utilities or facilities, namely the threat of methane leaks and explosions, the majority of underground infrastructure has no federal agency with direct authority to protect it. That said, the authority and influence PHMSA does have extends beyond pipelines to help improve the protection of all underground infrastructure in two general ways: first by knock-on effects associated with the protection of pipelines and second through work with groups that do specifically focus on protecting all buried infrastructure.

By regulating and overseeing damage prevention for pipelines, PHMSA has helped reduce damage to other subsurface infrastructure such as electrical, water, and telecommunications lines. This knock-on effect occurs because advancements in technology and standards implemented to protect pipelines from excavation damage, for example 811 One-Call centers and locating requirements, are often implemented in a manner that helps prevent damage to facilities other than pipelines (e.g., requiring excavators to notify of their intent to dig will result in One-Call centers sending notice to all utilities in an area, not limited to pipeline operators).

In fact, industry data demonstrates a decline in estimated total damage incidents nationwide after PHMSA was authorized and its damage prevention programs took effect.<sup>9</sup> The improved safety record and co-benefits of fewer incidents to non-pipeline infrastructure can be attributed to the adoption of the rules and regulations aimed at safeguarding pipelines, awareness campaigns and

grants, promotion of best practices, industry collaboration, and state enforcement improvements spearheaded by PHMSA.

In 2006, PHMSA identified nine elements of a successful damage prevention program.<sup>10</sup> It began working with states to evaluate, support, and encourage consistency in damage prevention laws nationwide.<sup>11,12</sup> PHMSA also works with state and federal agencies, trade groups, and researchers.

Additionally, PHMSA extends its damage prevention efforts by providing pipeline safety and damage prevention grants. In total, PHMSA now administers 13 types of grants, which last year provided upwards of \$98 million in funds to organizations responsible for pipeline safety and damage prevention.<sup>13,14</sup>

PHMSA's grants help fund technology, inspections, research, and oversight programs as well as nonprofit and community organizations. For instance, these funds support the Common Ground Alliance (CGA), a member-driven trade group composed of representatives from 16 stakeholder groups, including facility owner/operators, One-Call Centers and locators. CGA studies damage rates, emerging technology, and produces best practices guides.<sup>15,16</sup> Importantly, CGA emphasizes all aspects of damage prevention impacting the whole range of underground infrastructure, including best practices for each stakeholder group and each step of the damage prevention process. By supporting CGA, PHMSA influences protection of all underground infrastructure.

There are a number of other areas where PHMSA's damage prevention role extends beyond its pipeline jurisdiction. PHMSA undertakes "efforts [that] include performing studies, advocacy, grant making, rulemaking, and partnership with a wide spectrum of excavation damage prevention stakeholders."<sup>17,18</sup> PHMSA hosts conferences, joins panels with industry leaders, studies damage prevention, and more.

While PHMSA's damage prevention authority only allows direct action related to pipelines, the agency serves a critical role in research, awareness, funding, and other efforts that contribute to excavation damage prevention generally. In addition to its regulatory authority over pipelines, PHMSA studies and summarizes each state's damage prevention rules and regulations each year, providing a scoring of state approaches to help states improve their rules and enforcement. PHMSA also produces white papers and reports on damage prevention technology and best practices, helps lead pilot programs, and issues advisory bulletins as non-regulatory approaches to bolster damage prevention efforts.

### **PHMSA's Nine Elements of Effective Damage Prevention**

1. Enhanced Communication Between Operators and Excavators
2. Fostering Support and Partnership of All Stakeholders
3. Operator's Use of Performance Measures for Pipeline Locators
4. Partnership in Employee Training
5. Partnership in Public Education
6. Enforcement Agencies' Role to Help Resolve Issues
7. Fair and Consistent Enforcement of The Law
8. Use of Technology to Improve all parts of the Locating Process
9. Data Analysis to Continually Evaluate/Improve Program Effectiveness

## Agency Evolution and Damage Prevention Enforcement

Congress has reauthorized PHMSA continuously since its creation.<sup>19</sup> At each reauthorization, Congress assesses both the financial needs of the agency and policy priorities for it to pursue, making the reauthorization bills equal parts budgetary and programmatic. The first reauthorization was the 2006 Pipeline Inspection, Protection, Enforcement, and Safety (PIPES) Act.<sup>20</sup> Within this law, Congress directed the agency to promulgate and implement a damage prevention rule that would strengthen PHMSA's enforcement powers and raise the level of state programs across the country by defining federal requirements for state adherence in pipeline safety and excavation damage prevention laws.

While PHMSA continued to implement the programs and exercise the jurisdiction authorized by Congress, including enforcement against operators, the agency worked through the federal rulemaking process for 10 years to produce the specific excavator enforcement rule Congress prescribed. Finally in 2015 when the rule was published, PHMSA was enabled to evaluate state damage prevention enforcement programs and bring direct enforcement actions against third-party excavators in violation of state law.<sup>21,22</sup>

PHMSA has grown considerably from an initial \$60 million dollar budget with fewer than 100 employees to an annual budget of nearly \$300 million and more than 500 employees.<sup>23</sup> While much of its budget and size relates to other programs, with respect to damage prevention the agency's growth was accelerated by two significant developments: (1) PHMSA's ability to directly bring civil enforcement actions and (2) the addition of new grant programs and the administration of additional resources.

### State Adequacy and Enforcement

To ensure damage prevention laws already in place are effective, PHMSA sought to ensure that those laws were being enforced. Because each state has its own laws, PHMSA needed to set out parameters for evaluating each state's laws, review their enforcement practices, and designate processes for federal enforcement where state enforcement was lacking. Accordingly, the 2015 Rule required PHMSA to develop:

- Criteria and procedures PHMSA will use to determine the adequacy of State pipeline excavation damage prevention law enforcement programs;
- The administrative process PHMSA will use in determining the adequacy of State excavation damage prevention law enforcement programs;
- The Federal requirements PHMSA will enforce in States with inadequate excavation damage prevention law enforcement programs; and
- The adjudication process for administrative enforcement proceedings against excavators where Federal authority is exercised.<sup>24</sup>

One of the objectives of the 2015 Rule was to provide a framework for PHMSA to determine that the state pipeline damage prevention laws and programs are effectively organized and are being enforced.<sup>25</sup> This impacts whether PHMSA designates the state enforcement regime as "adequate." To evaluate the adequacy of the states' program, PHMSA asks seven questions:

1. Does the state have enforcement authority, including civil penalties?
2. Is there a designated enforcement body?
3. Is the state using its authority and making enforcement records available to the public?
4. Does the state have a reliable means of learning about damages?
5. Does the state have damage investigation practices that are adequate to determine the at-fault party when damage occurs?
6. At a minimum, does state law require that:
  - a. Excavators must call 811 before digging
  - b. Excavators must "respect the marks"
  - c. If damage to a pipeline occurs:
    - i. Excavator must report damage to operator at earliest practical moment.
    - ii. If release occurs, excavator must call 911.
7. Are exemptions from the damage prevention law limited? Written justification of exemptions is required.<sup>26</sup>

While PHMSA only reviews aspects of the state programs pertaining to regulated pipelines, the evaluation captures metrics that impact damage prevention across all facilities and stakeholder actions. For instance, the requirement to have an excavation notification process in place; this function (even if put in place for pipeline safety) provides notification through One-Call centers to all facility owners that may be impacted by a dig and thereby facilitates site marking of all underground facilities before excavation. This is an example of the knock-on effect generated even when the agency acts within its jurisdiction over pipelines.

In 2015, PHMSA began working with states and rating their enforcement programs. After the first year, 22 states were found to be adequate, 23 were inadequate, six states or territories were contesting their rating, and one state was still to be determined.<sup>27,28</sup> These ratings have consequences for the state and implications for PHMSA's authority.

When a state's enforcement procedures are found to be inadequate, the state may be subject to penalties and the door opens to PHMSA taking direct action.<sup>29</sup> When an third-party excavation incident occurs to a pipeline in a state where the laws were rated inadequate *and* that state has failed to bring its own enforcement action against the excavator, PHMSA is able to bring enforcement actions directly.<sup>30</sup> In addition to the 4,333 actions against operators over the past two decades, there have been at least seven civil actions taken against third-party excavators in the past two years in the few remaining inadequate states, which have included penalties and fines totaling over \$230,000.<sup>31,32</sup>

Today, 46 states and territories are rated "adequate", while five states and Washington, D.C. remain inadequate.<sup>33</sup> This means PHMSA can bring direct enforcement actions against excavators in six jurisdictions if state-level enforcement is not carried out. It is worth noting that PHMSA works with states to help them achieve an adequate rating, offering assistance, program evaluations, and other tools to elevate those state's enforcement capabilities. Interestingly, adequacy standard have not been raised over time. While PHMSA has been empowered to bring enforcement actions, its objective is that states enforce their own laws and achieve adequacy.



## Grants and Financial Resources

Another development in PHMSA's damage prevention focus is through its ability to make grants. Both the number of grants and the financial resources available have increased in the nearly two decades since PHMSA was created. PHMSA's grants are administered as specific programs, supporting issues like pipeline safety, one-call centers, and emergency response trainings. Certain grants are determined by formulas and tight parameters, while PHMSA retains greater discretion in administering other grants based on the strength of the application, funds available, and policy priorities.<sup>34</sup>

### Current PHMSA Grants:

- State Pipeline Safety Base \*
- Technical Assistance\*
- State Damage Prevention\*
- One Call\*
- Natural Gas Distribution Infrastructure Safety and Modernization \*
- Research and Development
- Competitive Academic Agreement Program
- Underground Natural Gas Storage
- Hazardous Materials Emergency Preparedness
- Assistance for Local Emergency Response Training
- Hazardous Materials Instructor Training
- Supplemental Public Sector Training
- Community Safety

\*Denotes relevant damage prevention-specific grants

These financial resources represent one way that PHMSA effectuates its damage prevention efforts. As the agency explains: "PHMSA provides grant opportunities designed to improve damage prevention, develop new technologies, or otherwise improve pipeline safety."<sup>35</sup> Through grants, not only can PHMSA further its core mission to protect pipelines, but it also uplifts damage prevention efforts for all buried infrastructure.

PHMSA grants are allocated to eligible applicants ranging from state authorities to One-Call centers, to educational organizations like CGA and universities, and to non-profits and municipal-level authorities. While PHMSA is limited to regulating pipelines, when it allocates funds to certain organizations, such as CGA or state One-Call centers, there is no question that those resources bolster damage prevention efforts affecting all underground infrastructure by strengthening standard operating

procedures, data analysis, and technology that is employed in all damage prevention efforts.

**Pipeline Safety Base Grants** are to be used for "cost of personnel, equipment and activities reasonably required to carry out inspection and enforcement activities of intrastate pipeline facilities." PHMSA partners with states by allowing state authorities to take over inspection and other regulatory functions for natural gas and hazardous liquids pipelines that the federal government oversees. To facilitate this partnership, PHMSA provides Pipeline State Base grant funding, which supports up to 80 percent of the qualified costs of pipeline safety activities in each state.<sup>36</sup> Grant eligibility begins with an annual 49 U.S.C. §60105 Certification or 49 U.S.C. §60106 Agreement and requires that states adopt minimum federal pipeline safety regulatory standards.<sup>37</sup> This certification and agreement process is performed by PHMSA annually to ensure the state has laws and practices in place and the capacity to take on these responsibilities.<sup>38</sup> The adequacy of each state's pipeline damage prevention enforcement laws determines the level of support the state can receive from this base funding. When states are notified of their inadequate rating, they also face a four percent reduction in pipeline safety base grant funding.<sup>39</sup>

**Pipeline Safety Technical Assistance Grants (TAG)** are available to communities, municipalities, and groups for supporting pipeline safety. These grants can include technical projects like engineering and design or analytical projects like risk assessment software. Funding is capped at \$100,000 per grant. One specified use of TAG funds has been the “improvement of safe digging programs,” which undoubtedly impacts safety systems for all buried utilities.

**State Damage Prevention Grants** are geared toward building up and supporting effective state damage prevention programs, which are targeted to pipelines, but a comprehensive program is likely to apply across the board to all underground facilities as well. Through these grants PHMSA encourages the states to implement the nine elements of effective damage prevention, meaning holistic and robust damage prevention programs.

**One-Call Grants** broadly “may be used to support initiatives to further promote efforts specifically for damage prevention, including one-call legislation, related compliance activities, training and public education.” Funds can also be used for awareness, communication, and marketing, such as call-before-you-dig awareness campaigns. A total of \$60,000 is available per state to those participating in PHMSA’s pipeline safety program.

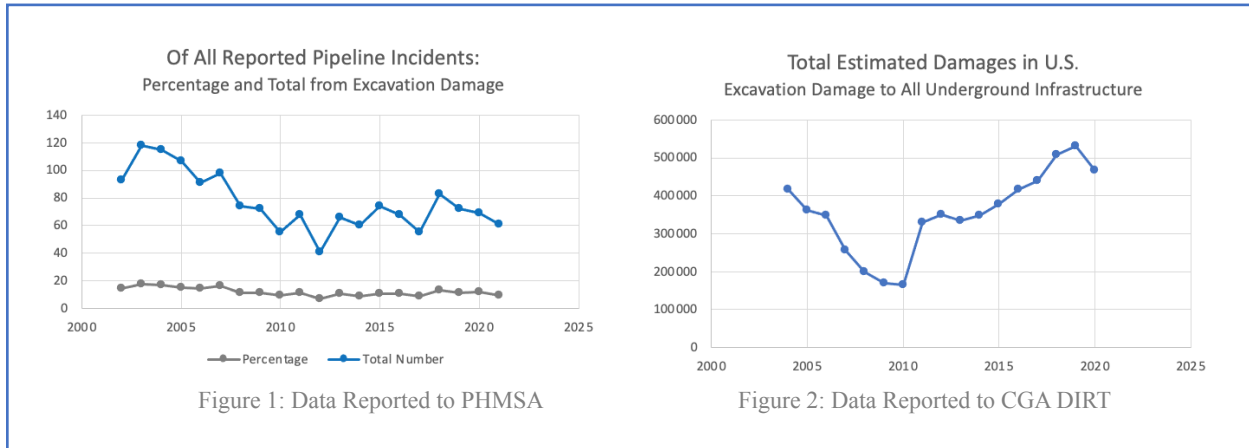
The four types of grants mentioned above provided over \$62 million in financial resources to damage prevention stakeholders in 2021, with PHMSA administering another \$35 million in other grants. All told, in addition to overseeing pipeline damage prevention, PHMSA is a major financial backer of nationwide programs, many of which may never get off the ground without these resources, such as programming from CGA or particular recipients of technical assistance grants used to create risk assessment systems.<sup>40</sup>

**The Natural Gas Distribution Infrastructure Safety and Modernization Grant** is a new program created from the Bipartisan Infrastructure Law in November 2021.<sup>41</sup> This grant with \$1 billion in funding could be a game changer if used to support damage prevention technology. Grants made under this program are geared toward municipal or community-owned utilities with the purpose to “(1) reduce incidents and fatalities and (2) to avoid economic losses.”<sup>42</sup> Slated to disperse \$200 million each year for five years, these funds will go “to repair, rehabilitate, or replace” natural gas distribution lines – activity which on its own actually threatens underground infrastructure because it requires digging, but which could also support projects like digitized records, improved locating ability, and other damage prevention technology.

Through these different paths, including regulation, enforcement, and grant making, PHMSA has unique and broad power in the damage prevention space. Not only can it act forcefully by directly bringing enforcement action, but it has the power to reward and encourage positive movements through its allocation of grant money and by promoting safety through implementation of new technology and higher standards by raising the requirements for state programs. At the same time, PHMSA is not able to require rules, regulations, technology, or best practices outside of pipeline excavation damage prevention, leaving it to support and bolster efforts in states and organizations like CGA which do impact the entire damage prevention ecosystem.

## Trends and Damage Prevention Efficacy

As the federal damage prevention authority, PHMSA works directly to reduce pipeline excavation incidents. Available data demonstrates that the agency was highly effective in reducing pipeline excavation damage incidents for nearly a decade. The rate of this decline, however, has not been maintained, and in recent years a slight uptick in pipeline incidents may even be occurring.



Evaluating the lifetime of the agency, there is a statistical trend of improved pipeline safety, but only when viewing a full 20-year timeline. No discernible trend is visible in the past decade with respect to pipeline incidents, as data shows pipeline damage numbers fluctuating. Still, damages to pipelines remain far lower during the period from 2010 to the present relative to the higher level of pipeline damages from 2002 through 2009, noting that PHMSA was not created until 2004.

With regard to damage prevention, PHMSA only has jurisdiction over pipelines. No federal agency has jurisdiction to oversee protection of the majority of subsurface infrastructure, which data from CGA shows have been rising for years. The knock-on effects from PHMSA's pipeline safety mandate that we have discussed above, including benefits of research, collaboration, and grants to One-Call centers and state damage prevention programs, have not overcome a nationwide trend in rising excavation damage to other underground infrastructure.

As Congress and PHMSA consider the efficacy and priorities of the nation's top damage prevention program, damage trends are important to evaluate. While considering these trends, policymakers must also reflect on the relevant jurisdiction and authority – that PHMSA has had jurisdiction over pipelines, which have seen a decline in damage events, and lacks jurisdiction over other subsurface infrastructure, which have seen a significant increase in damage incidents.

## Conclusion

Excavation damage trends are rising and affecting every state across the nation. Furthermore, the federal government recently infused the construction sector with billions of dollars to revitalize American infrastructure. Even before this new investment, it was expected that excavation damage to subsurface infrastructure would increase. The consequence of additional infrastructure spending will likely make this damage increase even greater. Given that existing damage trends are nationwide, it is critical that an effective federal damage prevention system be in place for the coming decade.

PHMSA currently serves as the principal agency leading the study, implementation, and oversight of damage prevention from the federal government. However, PHMSA's jurisdiction primarily over certain natural gas and hazardous liquids pipelines only captures around 10 percent of the underground facilities across the nation that are subject to risk of damage from excavation. The agency successfully helped drive down pipeline damages from highs two decades ago, but the estimated damages to *all* buried infrastructure are at all-time highs and trending higher.

For a decade, excavation damage has been increasing, both in number of incidents and cost to the U.S. economy across all subsurface infrastructure classes outside of pipeline, such as electrical, water, and telecommunication lines. A stronger federal damage prevention program is needed more than ever. The ways to achieve this include reexamining authority and jurisdiction or recalibrating existing authority. Congress could consider granting PHMSA broader authority or designating another authority over non-pipeline infrastructure protection. This could include direction for new rulemaking to PHMSA similar to its pipeline excavation enforcement rules or even to an agency like the Occupational Safety and Health Administration to generate new rules for construction activity.

Even without any added authority or directive from Congress, PHMSA can raise the standard for adequacy or prioritize the grants it already administers toward implementation of proven technology and implementation of best practices that, if adopted, may have the knock-on effect of reducing damages to all underground infrastructure. However, while required use of certain best practices and technology nationwide may help reduce the overall trend in excavation damage, without a new rule or Congressional mandate, PHMSA must rely on its non-pipeline power to research, study, collaborate, and administer grants in the hope that the spillover effect reduces excavation damage to *all* underground infrastructure.

Ultimately, the state of damage prevention today demonstrates not just that more *can* be done to protect underground infrastructure, but more *must* be done. How Congress and PHMSA evolve from here to promote safety and protect America's infrastructure is yet to be seen.

## Citations and Notes

- <sup>1</sup> Common Ground Alliance (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>.
- <sup>2</sup> “With elected officials in Washington, D.C., focused on moving legislation that will result in a significant investment in our nation’s infrastructure, coupled with the projected substantial increase in construction activity in the years to come, we expect the overall trend of rising damages will continue” – Sarah K. Magruder Lyle, President and CEO, Common Ground Alliance. (2021). *Damage Information Reporting Tool, Volume 17*.
- <sup>3</sup> *Id.*
- <sup>4</sup> Common Ground Alliance (2021). *Damage Information Reporting Tool Interactive Dashboard*. <https://commongroundalliance.com/DIRT-Dashboard>.
- <sup>5</sup> Direct and indirect costs have a ratio of 1:30, meaning the direct costs of rising damage also face a multiplier of 30 to calculate total indirect costs. By definition, more damage events lead to greater costs, both direct and indirect. See note 1 at p. 56-67.
- <sup>6</sup> Norman Y. Mineta Research and Special Programs Improvement Act § 108, 118 STAT. 2423. <https://www.govinfo.gov/content/pkg/PLAW-108publ426/pdf/PLAW-108publ426.pdf>.
- <sup>7</sup> Pipeline and Hazardous Materials Safety Administration (2022). *PHMSA By The Numbers*. U.S. Department of Transportation. <https://www.phmsa.dot.gov/>.
- <sup>8</sup> Dierker, B. (2020, August 18). *The Longest Running Statistic*. Alliance for Innovation and Infrastructure. <https://www.aii.org/the-longest-running-statistic/>.
- <sup>9</sup> Data according to CGA estimates. These statistics are the only source for damage rates in the country, however, they rely on voluntary damage reports and evolving statistical models to approximate the total. Further, these years coincide with the Great Recession, which likely had a downward pressure on construction spending and activity, which may be a factor in lower damage numbers. (See CGA DIRT Reports, 2004-2010.) This can be cross-referenced with the number of excavation damage incidents to pipelines reported to PHMSA for 2002-2021.
- <sup>10</sup> Pipeline and Hazardous Materials Safety Administration. (2019). *Nine Elements of Effective Damage Prevention Programs*. U.S. Department of Transportation. <https://primis.phmsa.dot.gov/comm/DamagePrevention9Elements.htm>.
- <sup>11</sup> This included using an agency-created “characterization tool” to produce detailed scorecard evaluations of each of the nine elements of effective damage prevention for all 50 states along with Washington, D.C. and Puerto Rico.
- <sup>12</sup> Pipeline and Hazardous Materials Safety Administration. (2019). *Characterization of State Damage Prevention Programs*. U.S. Department of Transportation. <https://primis.phmsa.dot.gov/comm/SDPPCDiscussion.htm>.
- <sup>13</sup> Pipeline and Hazardous Materials Safety Administration. (2022, January 7). *Grants*. U.S. Department of Transportation. <https://www.phmsa.dot.gov/about-phmsa/working-phmsa/grants>.
- <sup>14</sup> Pipeline and Hazardous Materials Safety Administration. (2021, September 29). *PHMSA FY2021 Pipeline and Hazmat Safety Grants*. U.S. Department of Transportation. <https://www.phmsa.dot.gov/news/phmsa-fy-2021-pipeline-and-hazmat-safety-grants-listing>.
- <sup>15</sup> As a Platinum Member of CGA, US DOT provides at least \$100,000 to the organization annually.
- <sup>16</sup> Common Ground Alliance (2022). <https://www.commongroundalliance.com/>.
- <sup>17</sup> Pipeline and Hazardous Materials Safety Administration. (2015, July 13). *PHMSA Issues Pipeline Damage Prevention Programs Final Rule*. Newsroom. <https://www.phmsa.dot.gov/news/phmsa-issues-pipeline-damage-prevention-programs-final-rule>.
- <sup>18</sup> Robertson, A. (2017). *EPA Technology Transfer Workshop*. U.S. Department of Transportation. [https://www.epa.gov/sites/default/files/2017-05/documents/damage\\_prevention\\_robertson.pdf](https://www.epa.gov/sites/default/files/2017-05/documents/damage_prevention_robertson.pdf).
- <sup>19</sup> Some reauthorizations have been three, four, or five years.
- <sup>20</sup> PUBLIC LAW 109–468—DEC. 29, 2006, PIPELINE INSPECTION, PROTECTION, ENFORCEMENT, AND SAFETY ACT OF 2006.

- <sup>21</sup> Pipeline and Hazardous Materials Safety Administration. (2015, July 23). *Pipeline Safety: Pipeline Damage Prevention Programs*. PHMSA Regulations, CFR 196, 198. <https://www.phmsa.dot.gov/regulations/federal-register-documents/2015-17259>.
- <sup>22</sup> See for example, Pipeline and Hazardous Materials Safety Administration. (2017, April 6). *State Damage Prevention Enforcement Program Adequacy Flowchart*. Safety Awareness. [https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/State\\_DP\\_Enforcement\\_Program\\_Adequacy\\_Flowchart](https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/State_DP_Enforcement_Program_Adequacy_Flowchart).
- <sup>23</sup> H.R.133 - Consolidated Appropriations Act, 2021.
- <sup>24</sup> Pipeline and Hazardous Materials Safety Administration. (2019, August 28). About Excavation Enforcement Final Rule. U.S. Department of Transportation. <https://www.phmsa.dot.gov/pipeline/excavator-final-rule/about-excavation-enforcement-final-rule>.
- <sup>25</sup> PHMSA conducts these evaluations pursuant to 49 United States Code § 60114 and 49 Code of Federal Regulations (CFR) Part 198, Subpart D—State Damage Prevention Enforcement Programs.
- <sup>26</sup> Pipeline and Hazardous Materials Safety Administration. (2020). *Excavator Enforcement Rule*. U.S. Department of Transportation. [https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/Enforcement\\_Rule\\_Briefing.pdf](https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/Enforcement_Rule_Briefing.pdf)
- <sup>27</sup> These ratings include Washington, D.C. and Puerto Rico, totaling 52 states and territories.
- <sup>28</sup> Pipeline and Hazardous Materials Safety Administration. (2019). *PHMSA General Update*. U.S. Department of Transportation. <https://slideplayer.com/slide/14111966/>.
- <sup>29</sup> 49 CFR § 198.53.
- <sup>30</sup> Pipeline and Hazardous Materials Safety Administration. (2021). *State Damage Prevention Enforcement Program Adequacy*. U.S. Department of Transportation. [https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/State\\_DP\\_Enforcement\\_Program\\_Adequacy\\_Flowchart.pdf](https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/State_DP_Enforcement_Program_Adequacy_Flowchart.pdf).
- <sup>31</sup> Pipeline and Hazardous Materials Safety Administration. (2022). *Summary of Enforcement Activity Nationwide*. U.S. Department of Transportation. <https://primis.phmsa.dot.gov/comm/reports/enforce/EnfHome.html?nocache=9108>.
- <sup>32</sup> Pipeline and Hazardous Materials Safety Administration. (2020). *Listing of Third Party Excavation Enforcement Cases Initiated*. U.S. Department of Transportation. [https://primis.phmsa.dot.gov/comm/reports/exc\\_enforce/CasesOpen\\_opid\\_0.html?nocache=3310](https://primis.phmsa.dot.gov/comm/reports/exc_enforce/CasesOpen_opid_0.html?nocache=3310).
- <sup>33</sup> Pipeline and Hazardous Materials Safety Administration. (2021, May 21). *Determinations of Adequacy*. Safety Awareness. <https://www.phmsa.dot.gov/pipeline/excavator-final-rule/determinations-adequacy>.
- <sup>34</sup> Pipeline and Hazardous Materials Safety Administration. (2019). *Pipeline Safety Grant Programs*. U.S. Department of Transportation. <https://primis.phmsa.dot.gov/comm/DamagePreventionGrantsToStates.htm>.
- <sup>35</sup> *Id.*
- <sup>36</sup> Pipeline and Hazardous Materials Safety Administration. (2021, February 3). *Pipeline Safety Base Grants*. Working with PHMSA. <https://www.phmsa.dot.gov/grants/pipeline/pipeline-safety-base-grants> (49 U.S. Code § 60107).
- <sup>37</sup> Pipeline and Hazardous Materials Safety Administration. (2022). *State Programs Overview*. Working with PHMSA. <https://www.phmsa.dot.gov/working-phmsa/state-programs/state-programs-overview>.
- <sup>38</sup> Pipeline and Hazardous Materials Safety Administration. (2022, March 3). *Federal/State Legislative Authorities*. State Programs. <https://www.phmsa.dot.gov/working-phmsa/state-programs/federalstate-legislative-authorities>.
- <sup>39</sup> Pipeline and Hazardous Materials Safety Administration. (2021, April 6). *Signed DC Notice of Inadequacy Letter for 2020 CLEAN*. U.S. Department of Transportation. <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2021-05/Signed-DC-Notice-of-Inadequacy-Letter-for-2020-CLEAN.pdf>.
- <sup>40</sup> Pipeline and Hazardous Materials Safety Administration. (2021). *Pipeline and Hazmat Safety Grants*. U.S. Department of Transportation. See TAG, p. 21. [https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2021-09/PHMSA%20FY21%20Comprehensive%20Grants%20Report\\_0.pdf](https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2021-09/PHMSA%20FY21%20Comprehensive%20Grants%20Report_0.pdf).
- <sup>41</sup> Pipeline and Hazardous Materials Safety Administration. (2022, April 4). *Natural Gas Distribution Infrastructure Safety and Modernization Grants*. U.S. Department of Transportation. <https://www.phmsa.dot.gov/grants/pipeline/natural-gas-distribution-infrastructure-safety-and-modernization-grants>.
- <sup>42</sup> *Id.*



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