

2018 State Damage Prevention Program Grant Progress Report
CFDA Number: 20.720

Award Number: #693JK31840020PSDP

Grant Title: *New Jersey Board of Public Utilities State Damage Prevention (SDP) Grant*

Project Title: **Project 1:** *Computer Analysis tool to determine the impact on the community and total cost of excavation damages.*

Project 2: *Personnel Expenses to Enforce SDP Laws (NOT FUNDED BY THIS GRANT)*

Report Period: 09/28/19-10/31/19

Date Submitted: 1/16/20

Submitted by: Joseph Costa

Specific Objective(s) of the Agreement

Under this grant agreement, the NJBPU will enforce:

- *Laws and regulations of the damage prevention process*

Work scope

Under the terms of this grant agreement, the Recipient will address the following elements listed in the approved application as stated in 49 U.S.C. §60134 (b).

- ***Element 7 (Enforcement):*** *Enforcement of State damage prevention laws and regulations for all aspects of the damage prevention process, including public education, and the use of civil penalties for violations assessable by the appropriate State authority.*

Accomplishments for this period (“A comparison of actual accomplishments to the objectives established.”)

Project 1

The purpose of this project was to develop a computer analysis tool to determine the cost to a community resulting from excavation-related utility damages, and use those costs as a factor in determining civil penalties for violations of the New Jersey Underground Facilities Protection Act.

Excavation damage cases were analyzed to determine the impact on the community (e.g., utility service interruptions, property damage, traffic congestion, loss of business revenue, etc.) and the costs associated with the disruption of community services as well as the utility repair costs to restore services. The data collected and information analyzed provides a means for measuring the total impact of excavation damage cases and to develop a range of civil penalties that reflect the severity of the excavation damage on the community. This project directly affects Element 7 (Enforcement) of the NJBPU Damage Prevention Program. The project was developed by Rutgers University Center for Advanced Infrastructure and Transportation (CAIT). The project consists of the following tasks:

- **Task 1:** Conduct a domestic and international literature scan to identify relevant studies and efforts in quantifying the true cost of utility damages, in particular for natural gas pipeline facilities.

- Task 2: Create an influence diagram to identify all types of associated costs with utility damages and determine potential data sources to quantify these factors.
- Task 3: Data collection to establish cost criteria and cost range.
- Task 4: Establish a cost database based on historical data, cases, and collected data.
- Task 5: Develop a computer analysis program for estimating the true cost of utility damages to natural gas line facilities.
- Task 6: Demo and test the computer analysis program with BPU staff.
- Task 7: Develop mid-term and final reports.

The following seven major tasks were executed and are detailed in the Rutgers CAIT Final Report to the NJBPU which is included with the final progress report documents:

- Task 1 - The project team has completed reviewing related literature and use cases. A review report was compiled.
- Task 2 - The team has identified related factors for estimating costs pertaining to underground excavation damages.
- Task 3 - A list of subject matter experts was assembled and they were interviewed regarding the cost factors related to utility damage.
- Task 4 - The project team has completed the database structure.
- Task 5 - The project team has studied different platforms that can be used to develop the proposed analysis program.
- Task 6 - This task was completed.
- Task 7 - A final progress report was completed.

Project 2

SDP Grant funds were proposed to be used to offset the salary and fringe benefits of a Damage Prevention NJBPU employee to perform compliance and enforcement program activities. While compliance and enforcement activities were performed, project 2 WAS NOT FUNDED BY THIS GRANT.

Quantifiable Metrics/Measures of Effectiveness (“Where the output of the project can be quantified.”)

Project 1

All of the project tasks were completed. The deliverables from this project are as follows:

The purpose of this research project was to develop a computer analysis tool that could be used to determine the impact on the community and total cost of excavation damages. Key findings of the project include:

1. Utility companies generally focus on the direct costs associated with utility damages and the indirect and social costs resulting from utility damages tend to be unaccounted for or are not fully investigated.
2. A considerable amount of work has been done to quantify the indirect and social cost of excavation damages. Given the lengthy and sometimes exhaustive list of factors to consider (e.g. emissions costs, traffic delays, loss of productivity, impact on local business, etc.), cost information on related impacts and the monetary value of these impacts are often unavailable. Given the large number of damages

experienced in the United States year after year, this knowledge gap would have to be addressed, in order to account for the indirect and social costs associated with utility damages.

A suitable technique to measure the 'true cost' of utility damages was studied. A 'New Approach' approach has been proposed, going beyond the current industry damage measure of direct repair costs, to include and quantify indirect and social costs incurred by damages (where possible) and thus promoting the quantification of the 'true costs'. In twenty-five case studies, the technique was applied, tracking and quantifying (if any) the associated costs arising from excavation damages. The key findings arising from applying the technique 'New Approach' to all of the cases studies of utility damages are:

1. Difficulties have been encountered in obtaining accurate up-to-date data that promote the quantification of the indirect and social costs of excavation damages, perhaps because such information is not collected or available in most instances, and may be considered sensitive in nature. This has hampered the estimation of the related indirect and social costs. Additional steps must be taken if these costs are to be determined.
2. Of the 25 case studies, the average 'true cost' ratio was 19:1. This result illustrates, above direct costs, the significant actual cost of utility damages. It should be remembered, however, that these results were focused on a limited number of case studies. The ratio also shows the adverse effect that utility damages can have on the environment, quality of life, and business operations. To gain greater confidence in the 'true cost' ratios, a larger set of case study data is needed.
3. There is a need to identify a set of indirect and social cost parameters (protocols) that can be used to establish an acceptable standard for the 'true cost' measurement of excavation damages.

The key issue is how to mitigate the costs incurred as a result of excavation damage incidents. A better understanding of the true costs incurred as a result of utility damages would promote an improved business approach to reduce or mitigate these associated costs, and the ratio analysis method provided in this document is a summary of one possible solution to this problem. A computer analysis tool was created for New Jersey Board of Public Utilities' staff to provide a valuation method for utility damages.

Issues, Problems or Challenges ("The reasons for slippage if established objectives were not met.")

Project 1

Planned objectives were accomplished after a contract was executed with Rutgers CAIT.

Project 2

NOT FUNDED BY THIS GRANT

Financial Status Report ("A summary of project costs for the report period.")

Final Financial Status Report

The Final Financial Report has been sent as a separate attachment to the AA. See Form SF-425, Federal Financial Report, submitted on January 16, 2020.

Final Project Costs

Project 1 – Computer Analysis Tool – Cost of Excavation Damage

Billing Period	Payment Date	Contract Amount Paid to Rutgers - CAIT
3/1/19 – 5/31/19	7/12/19	\$6,445.80
6/1/19 – 8/31/19	11/15/19	\$26,922.91
9/1/19 – 10/31/19	1/9/20	\$23,631.29
	Total	\$57,000.00

Total Project 1 Costs..... \$57,000.00

Total Project Costs (Project 1)..... \$57,000.00

Project Costs paid with Mid-Term Progress Report..... \$28,500.00

Project Costs requested with Final Progress Report..... \$28,500.00

Plans for Next Period (Remainder of Grant)

Project completed –no further actions needed.