



RESEARCH PROJECT CAPSULE [15-2SS]

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TECHNOLOGY TRANSFER PROGRAM

Cost and Time Benefits for Using Subsurface Utility Engineering in Louisiana

JUST THE FACTS:

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POINTS OF INTEREST:

Problem Addressed / Objective of
Research / Methodology Used
Implementation Potential

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PROBLEM

Most major road construction projects managed by the Louisiana Department of Transportation and Development (DOTD) have utilities that must either be relocated or at least accounted for during construction. The standard method for locating the underground utilities is to have the utility company or LA One Call mark them.

There are a few problems with this method: the accuracy required for design and construction is not met due to out-of-date plans or inferior technology; some utilities are not accounted for, as there are many who are not members of One Call; and some companies have changed ownership numerous times and the original location of lines, or even knowledge of their existence, has been lost.

Subsurface Utility Engineering (SUE) providers have the ability to precisely locate a utility line using non-destructive vacuum excavation. There has been an abundance of research on the benefits of SUE services in other states. There is a need for state-specific research in Louisiana for estimating the benefits and costs of these services.

OBJECTIVE

The objectives of this research are: to establish a record of all major projects where DOTD has used SUE services in the past (SUE quality levels depicted in Figure 1), including interviews with various DOTD personnel, utility companies, and contractors; to determine how much was spent on SUE services; to identify potential hazards that would have been encountered if SUE services were not utilized; to estimate cost savings; and to identify types of projects where net benefits are greatest when using SUE services.

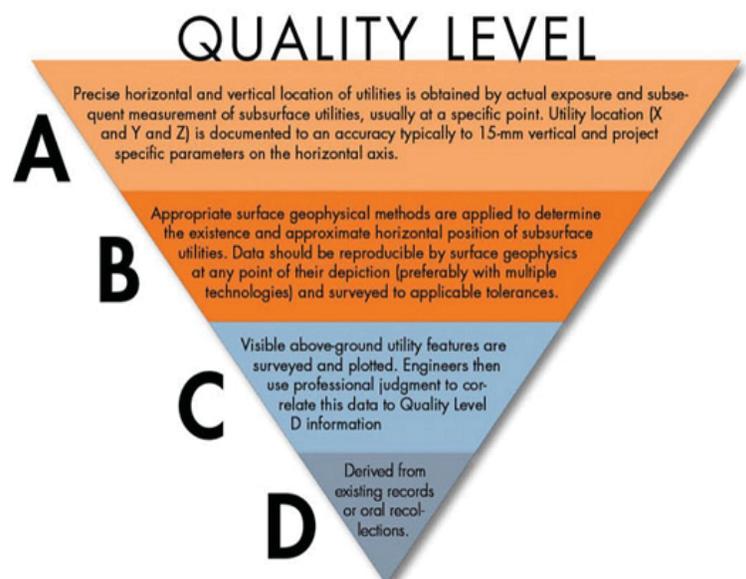


Figure 1
SUE Quality Levels

(source: <http://trenchlessonline.com/the-three-qs-of-sue-vs-one-call/>)

METHODOLOGY

After identifying construction projects completed in the recent past (3-5 years) that used SUE quality levels A or B, the projects will be categorized in terms of utility complexity (e.g., complex, simple) and contract size (e.g., < \$5M, > \$5M). For each project, the time and cost associated with the location of the utilities, as well as an estimate of time and cost associated with failure to correctly locate the utilities, will be determined.

Using the same proportion of projects for each of the established categories, a random selection of construction projects that used SUE quality levels C or D will be identified. Similar time and cost determinations will be made for these projects as done for the level A or B projects.

Based on this information, SUE cost per \$1000 construction cost can be calculated for each combination of category and SUE quality level. Similarly, SUE time (in hours) per \$1000 construction cost can be calculated for each combination.

Relative cost savings from using SUE services can be estimated by dividing the SUE cost per \$1000 construction cost for each quality level by the corresponding SUE cost for each of the other quality levels. Relative time savings from using SUE services can be estimated using the same procedure.

Each category can then be ranked in terms of SUE cost per \$1000 construction cost and in terms of SUE time per \$1000 construction cost for each quality level. Interpretation of these rankings will help distinguish the degree to which projects benefit from using SUE services.

IMPLEMENTATION POTENTIAL

It is important for DOTD to know the relative benefit of using SUE services, given that all prior studies have been in other states and have produced widely different results. This research may reveal which factors are most important to distinguish whether a project will benefit from using high quality levels of SUE, allowing identification of projects that provide net benefits and those that do not justify the associated expense.