

Subsurface Utility Engineering (SUE)

Delivering projects more efficiently by reducing utility conflict risks.



Source: GDOT



Source: GDOT



Source: GDOT

Highway designers in the United States often do not have reliable information about what lies underground where projects are planned. Unexpected conflicts during construction are one of the leading causes of delays and cost overruns. Subsurface Utility Engineering (SUE) helps solve this problem by using engineering, surveying, and underground-detection tools to locate and map utilities early in the planning and design process, reducing the risk of costly surprises later.

A BETTER LOOK AT BURIED UTILITIES

SUE uses a mix of engineering, surveying, and geophysical methods such as vacuum excavation and subsurface-scanning tools to locate underground utilities. State and Local transportation agencies use SUE to decide how much utility information is needed for a project and to collect and manage that data throughout the project's design, construction, and beyond. A typical SUE study includes:

- ▶ Mapping utilities with the right level of detail (quality levels)
- ▶ Identifying possible utility conflicts with planned work
- ▶ Checking the condition of existing utilities
- ▶ Planning how to move utilities or design around them
- ▶ Communicating utility information with appropriate stakeholders

The American Society of Civil Engineers (ASCE) provides standard guidelines for SUE. These include:

- ▶ [Standard Guideline for Investigating and Documenting Existing Utilities, ASCE/UESI/CI 38-22](#)
- ▶ [Standard Guideline for Recording and Exchanging Utility Infrastructure Data, ASCE/UESI/CI 75-22](#)

These guidelines describe four quality levels of utility information, from Level D (least accurate) to Level A (most accurate).

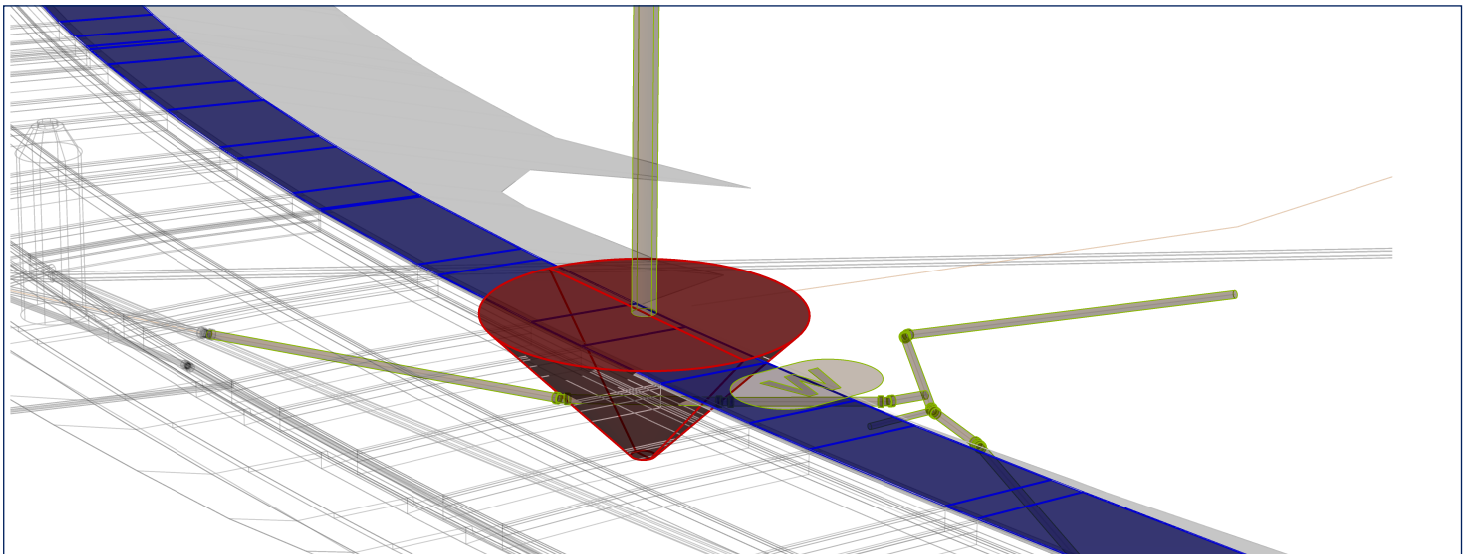
BENEFITS

Increased Safety. Helps crews avoid digging into utilities, reducing the risk of injury and property damage.

Cost & Time Savings. Lowers the chance of unexpected utility costs and delays during construction.

Increased Efficiency. Gives designers better information so they can plan layouts that avoid utility conflicts.

Lower Risk. Helps avoid construction delays caused by cutting, damaging, or finding unmarked utility lines.



Source: Georgia Department of Transportation
3D model of underground utilities.

STATE OF PRACTICE

Many States report using SUE, but few use it consistently. States with experience in SUE—such as the Georgia Department of Transportation, Texas Department of Transportation, and Colorado Department of Transportation—report several benefits, including:

- ▶ Designs based on better information
- ▶ Fewer utility related change orders
- ▶ Improved damage prevention
- ▶ Lower chance of surprise utility discoveries during construction

RESOURCES

[Implementation of Subsurface Utility Engineering for Highway Design and Construction \(2022\)](#)

[Standard Guideline for Investigating and Documenting Existing Utilities \(38-22\)](#)

[Standard Guideline for Recording and Exchanging Utility Infrastructure Data \(75-22\)](#)

[FHWA's SUE Website](#)



Except for the statutes and regulations cited, the contents of this document do not have the force and effect of law and are not meant to bind the States or the public in any way. This document is intended only to provide information regarding existing requirements under the law or agency policies. The U.S. Government does not endorse products or manufacturers. Trademarks or manufacturers' names appear in this document only because they are considered essential to the objective of the document. They are included for informational purposes only and are not intended to reflect a preference, approval, or endorsement of any one product or entity.



U.S. Department of Transportation
Federal Highway Administration

Julie Johnston
FHWA Office of Infrastructure
(202) 591-5858
julie.johnston@dot.gov

Clayton Wellman
FHWA Office of Infrastructure
clayton.wellman@dot.gov

Robert Mooney
FHWA Office of Infrastructure
(202) 897-7549
robert.mooney@dot.gov