

ODOT Subsurface Utility Engineering

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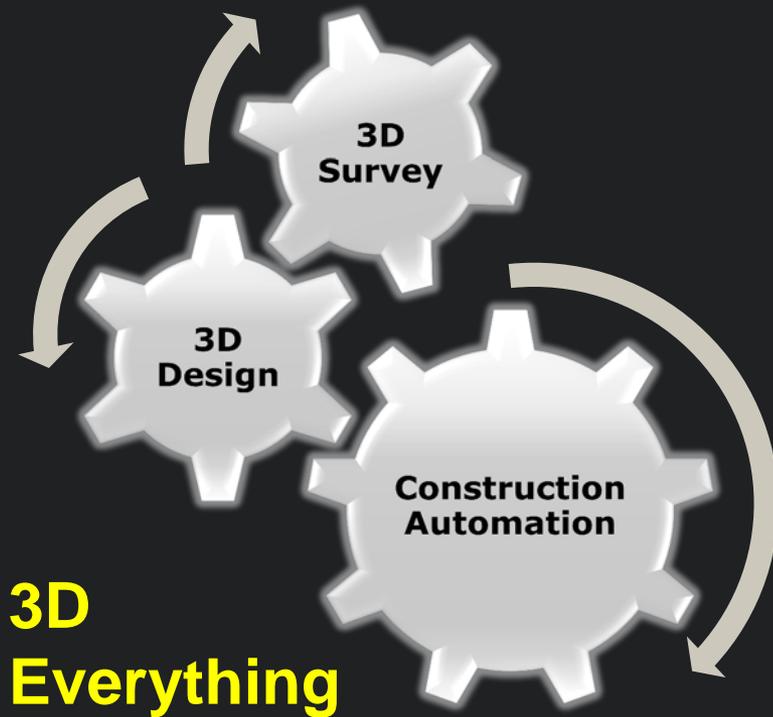
Chris Pucci
Construction Automation Surveyor



August
2016



New Engineering Automation Section at ODOT



Moving toward 3D Everything

Roadway Design

Bridge Design

Above ground

Underground

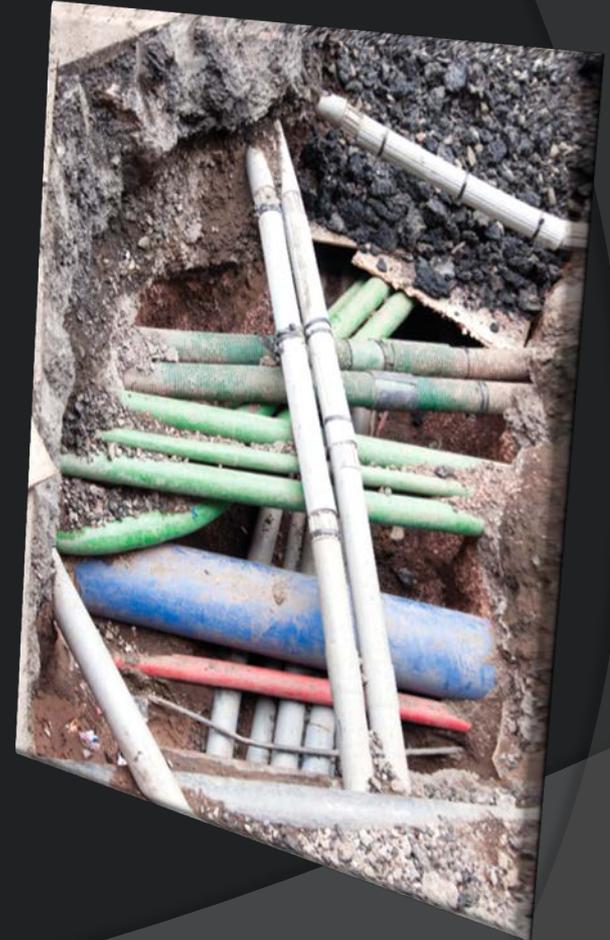
Complete Virtual Highway

Key Piece to 3D Everything is Subsurface Utilities

Collaborating with Utility companies to Collect 3D Utility Information

Benefits Include

- Construction Safety
- Conflict Reduction
- Time Savings
- Cost Savings



Oregon SUE – Huge Step Forward

February 2, 2015

SUE Memorandum

from Department of Justice
to Oregon Department of Transportation

ELLEN F. ROSENBLUM
Attorney General

FREDERICK M. BOSS
Deputy Attorney General

DEPARTMENT OF JUSTICE
GENERAL COUNSEL DIVISION

MEMORANDUM

RECEIVED
FEB 05 2015
BY: Julie Rayburn

DATE: February 2, 2015

TO: Tom Lauer, Technical Services Manager
Ranvir Singh, Chief of Surveys, Geometrics Manager
Oregon Department of Transportation

FROM: Lucinda D. Jackson, Senior Assistant Attorney General
Government Services Section

SUBJECT: Use of Highway Funds for Subsurface Utility Engineering (SUE)
DOI File No. 734040-GG1157-14

Designing a highway project, including surveying above and below the ground, is also an important aspect of constructing, reconstructing and improving highways. Highway Funds are appropriately used for surveying above ground features and for the surface location of underground utilities. The use of Highway Funds for new technology, such as SUE, that provides a better, more accurate way to survey below the ground for utilities should be treated no differently. As a result, I conclude that Highway Funds can be used for SUE.

activities of ODOT regarding the relocation of utility facilities were component parts of the reconstruction and improvements of the roads in question by ODOT.

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Please let me know if you have any further questions.

²Previously, this office provided comprehensive guidance on the constitutional use of Highway Funds in a letter to Grace Crunican, ODOT Director, dated January 31, 2001.



What is Subsurface Utility Engineering?

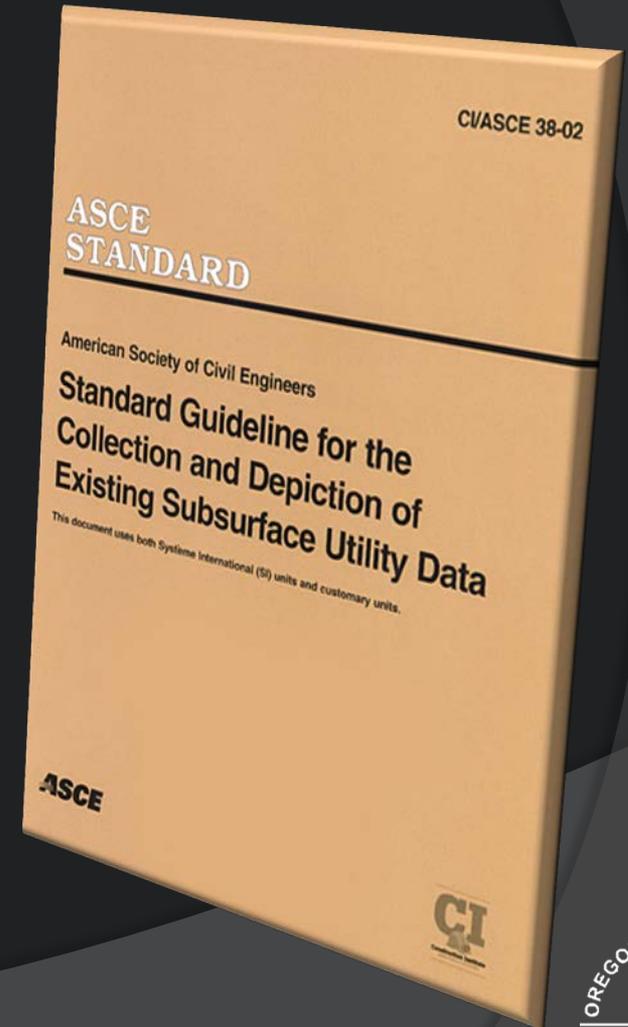
Simply put it is Engineering Processes that attempt to manage risk with respect to:

- Utility Coordination
- Utility Mapping in accordance with ASCE Quality Levels
- Utility relocation design and cost estimates
- Utility relocations and adjustments

Utility Mapping in accordance with ASCE Quality Levels

The American Society of Civil Engineers developed a National Consensus Standard, CI/ASCE 38-02, titled “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data”.

Currently used in contracts to aid in definition of an engineer’s standard of care and level of responsibility. Updated document planned for release this year.



Utility Mapping ASCE Quality Levels

Quality Level D (QL-D)

Existing Utility Records

- Information obtained from review of known utility records and documentation of verbal accounts and/or one-call markings.
- Purpose is assessment of the major active utilities and approximate locations referenced to the known plan documents.



Utility Mapping ASCE Quality Levels

Quality Level C (QL-C)

Survey of Visible Features

- Coupled with QL-D information by adding surveyed surface features such as utility poles, junction boxes, fire hydrants, valves, risers, and manholes.
- Purpose: Develop the approximate horizontal positions of underground utilities.

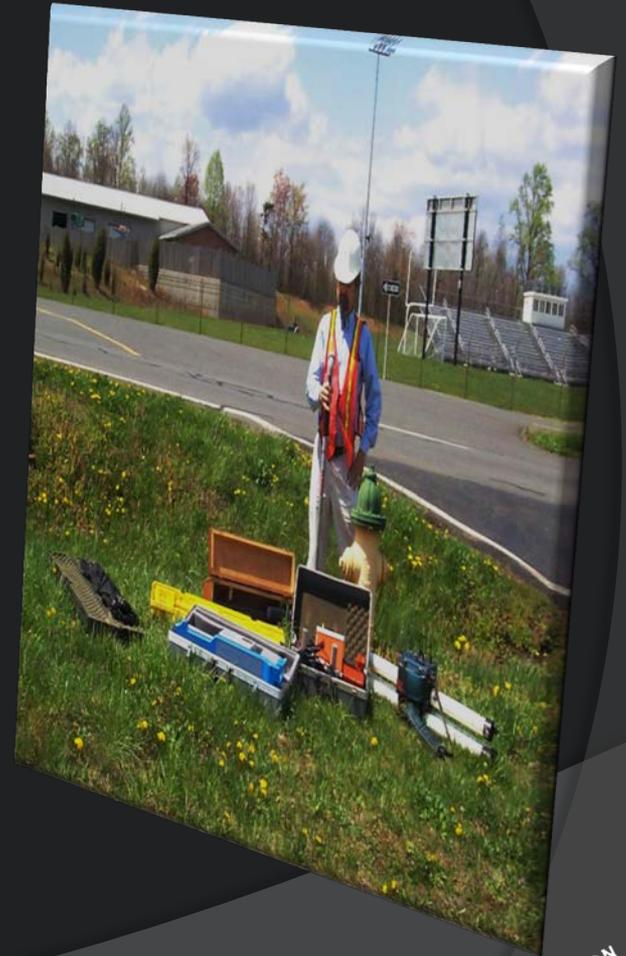


Utility Mapping ASCE Quality Levels

Quality Level B (QL-B)

Utility Designating

- Geophysical systems are designed to evaluate existing and approximate horizontal locations of underground utilities.
- Geophysically located utility precision may be influenced by equipment limitations, external EM sources (power plants), geology, and operator experience.

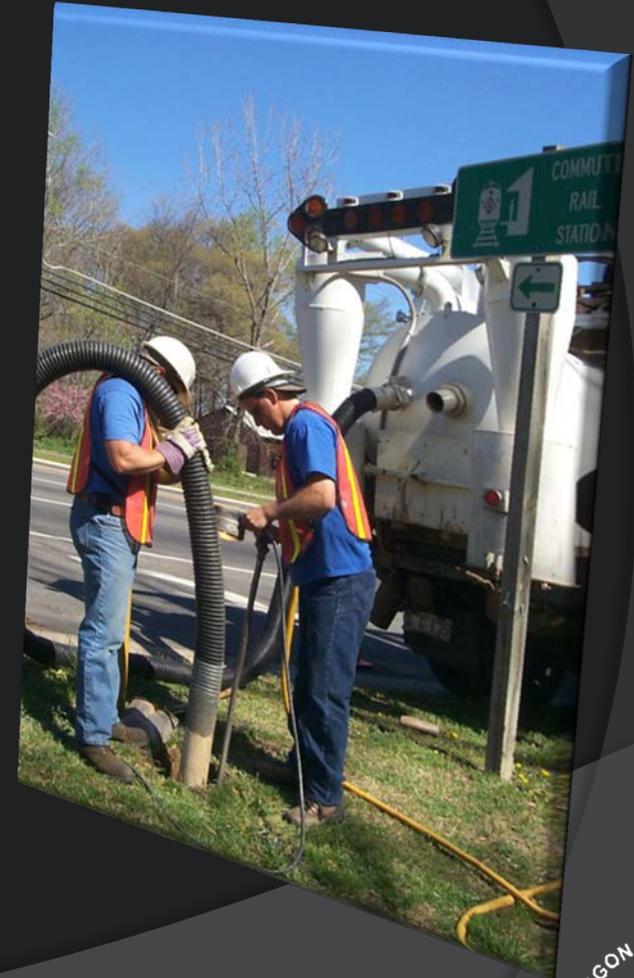


Utility Mapping ASCE Quality Levels

Quality Level A (QL-A)

Utility Locating

- Subsurface utility data obtained via exposure at specific points followed by survey.
- Precise and accurate horizontal and vertical data are surveyed and recorded.
- Provides utility type, size, material, and other characteristics



When will ODOT deploy Subsurface Utility Engineering?

- Formative period – Near Future
 - Seeking Utility Owner perspective.
 - Seeking OMEU, NWUCA , AGC, APWA, and others input.
 - Develop a plan with timelines.
- Big Questions – Near Future
 - Who manages, stores, and provides data.
 - Need to address data security, standards, and quality.
 - Should ODOT and Utility Owners require survey quality 3D data for all new and or modified installations within the Right-of-Way?

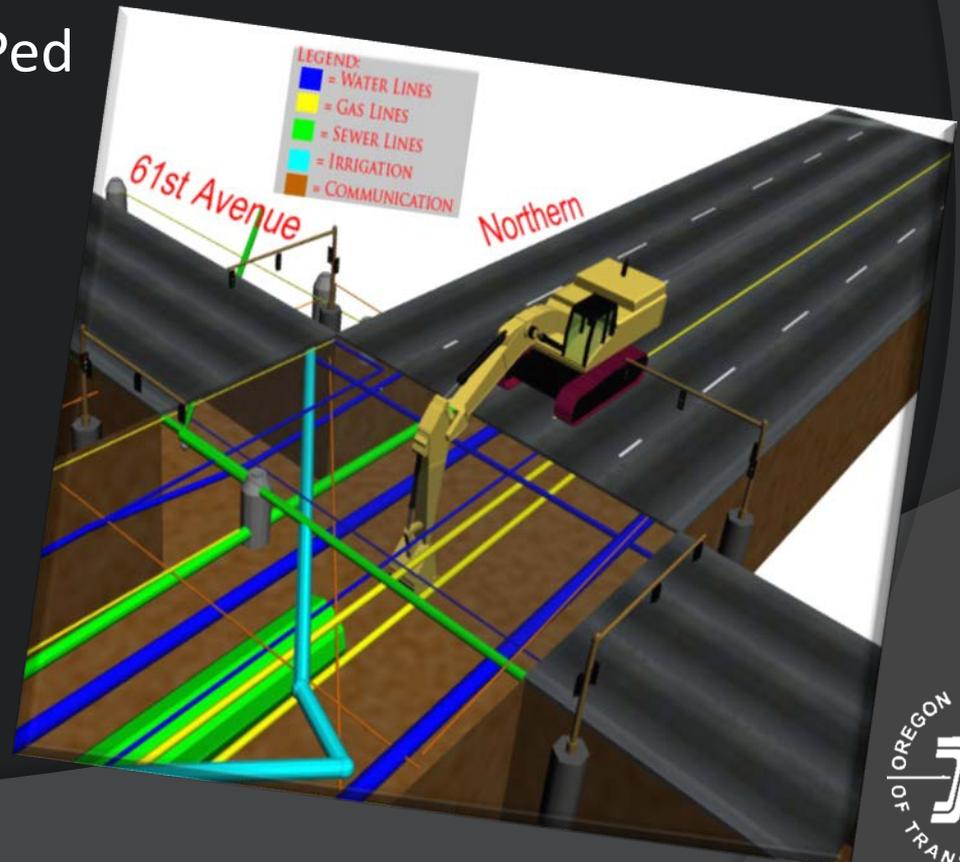
What projects and why will ODOT deploy Subsurface Utility Engineering?

- **What?**

- Projects with below existing grade earth work
- Culvert, Roadside Drainage, Stormwater Systems
- Roadway, Bridge, Bike, Ped
- Geotechnical Mitigation
- Signals, IT, Luminaires

- **Why?**

- Safety
- Accuracy and precision
- Clash detection
- Reduce risk and delay
- Return on Investment



Status of Deployment

- **SUE Pilot Project**

- Hwy 217 and Greenburg Road in Tigard
- In process now – plan to be complete by Fall 2016

- **FHWA SHRP2 Implementation Grants**

- ODOT has been awarded three grants to help implement SUE

- **Statewide SUE Information Session**

- Conducted July 26, 2016
- SUE Meeting with discussion
- Utility Owners from across state



Construction Possibilities

Real-time 3D plan set projection onto Project Sites



Thank you for your invitation

Questions?

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