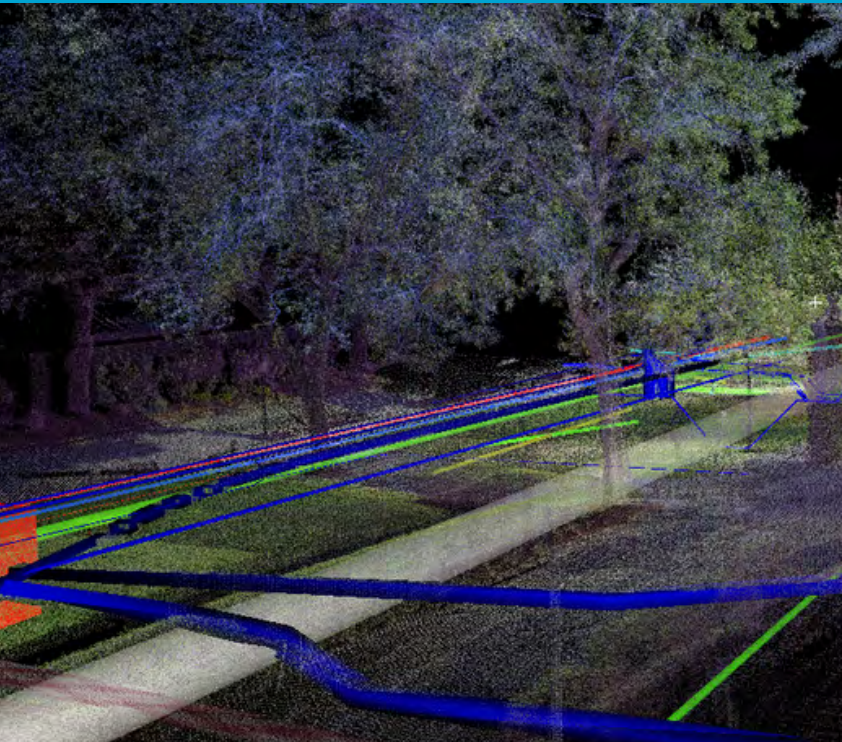


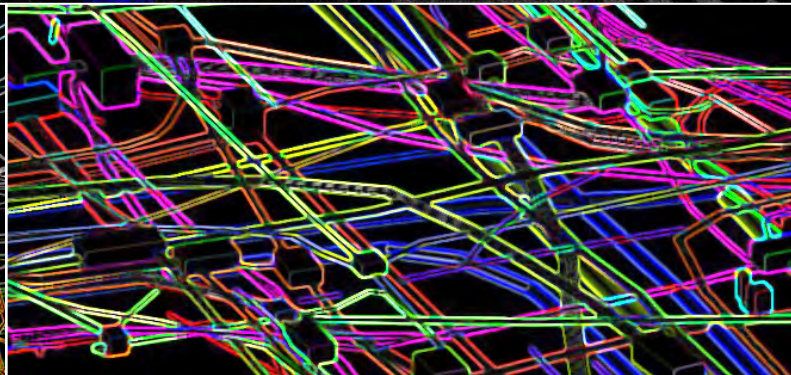
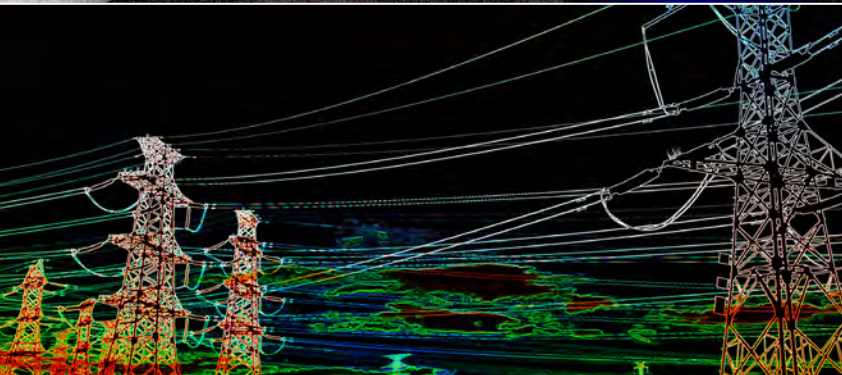
# SUBSURFACE UTILITY PROJECT MANAGEMENT & DAMAGE PREVENTION

*Reduce Project Costs, Delays, and Risks  
Associated with Accidental Utility Damage*



November 13-14, 2017  
Hyatt Regency Boston  
Boston, MA

December 4-5, 2017  
Houston Marriott West Loop  
by the Galleria  
Houston, TX



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EUCI is authorized  
by IACET to offer  
1.3 CEUs

## OVERVIEW

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Every day, new facilities are installed, replaced, and relocated beneath busy city streets, private commercial and industrial properties, further complicating the underground network infrastructure. Therefore, **knowing, recording, and managing data of the location of buried infrastructure is crucial** to avoid disastrous incidents. The past decade has witnessed **groundbreaking technological advancements in Subsurface Utility Mapping (SUM)**. Despite the high project cost of underground utilities construction or relocation projects, traditional mapping techniques used to construct composite diagrams of subsurface infrastructure are often poor and incomplete. "Surprise discoveries" of utility and change orders in utility construction, submitted under the category of "unforeseen site conditions" are still very much present. What is more, there is **an alarming number of serious utility strikes** nationwide which have resulted in numerous deaths, a vast amount of private property being destroyed and legislators taking another look at what can be done to change the industry. Despite the international adoption of Geographic Information Systems (GIS) by utility owners to map and manage underground infrastructure, it is still difficult to find an accurate and reliable subsurface utility plan on any given jobsite.

EUCl's 2-day **Advanced Course on Subsurface Utility Project Management & Damage Prevention** will emphasize fundamental components of SUM – Defining a standard of care for SUM projects. **Participants will gain hands-on experience** with precise planning and design of SUM projects, geophysical techniques and tools, and various non-destructive excavation techniques which contribute to **accurate and faster project completion and cost savings**.

## 3 TOP REASONS TO ATTEND

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1. **Learn how to overcome the challenge of poor and insufficient underground utility data obtained during planning and design phase of a project.**
2. **Gain hands-on course experience with GPR and other locating devices in class.**
3. **Collaborate with colleagues on best practices during in-class group exercises.**

## LEARNING OUTCOMES

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- Develop an effective Subsurface Utility Exploration project scope based on unrivaled best practices in subsurface utility mapping
- Strengthen return on investment projection with better insights on pricing structure and cost estimates for SUM services including project delivery formats
- Identify and reduce risks of subsurface utility mapping by applying appropriate methodologies during project planning phase
- Assess how to effectively incorporate an SUE plan into the planning, design and construction phases of the project

## WHO SHOULD ATTEND

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- Subsurface utility engineers
- Project managers
- Architects
- Surveyors
- Field engineers from underground utility asset owners
- Contracting firms providing underground excavation
- Engineering
- Installation
- Maintenance services



# AGENDA

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MONDAY, NOVEMBER 13, 2017 | BOSTON, MA

MONDAY, DECEMBER 4, 2017 | HOUSTON, TX

- 8:00 – 8:30 am**                    **Registration & Continental Breakfast**
- 8:30 – 8:45 am**                    **Welcome and Opening Remarks**
- 8:45 – 10:30 am**                    **Subsurface Utility Exploration Techniques Overview and Importance**
- Subsurface Utility Locating vs. Underground Damage Prevention
  - Understand the difference between utility locating services provided by underground asset owners, contract locators, survey & engineering firms, and subsurface utility mapping firms
  - Risk Management Roundtable Discussion: Participants shall form into small groups to identify potential utility strike hazards based on their respective industry projects
- 10:30 – 11:00 am**                    **Networking Break**
- 11:00 am – 12:30 pm**                    **Working Together to Prevent Damage: Laws, Rules, Regulations and 811 Programs.**  
*Handout materials will be provided by CGA on best practices and Data Reporting and Evaluation Update (DIRT).*
- Analyze selected best practices from Common Ground Alliance (CGA) member organizations. DIRT Update: Changes to the Damage Information Reporting Tool coming in 2018
  - Using GIS to improve pipeline safety through One Call Optimization, and changing regulations call for improved GIS support
  - A look at PIPES Act (2006 – 2016) and new legislation
- 12:30 – 1:30 pm**                    **Group Luncheon**
- 1:30 – 2:30 pm**                    **Risk Management Techniques & Risk Transfer to Limit Liability & Corporate Financial Exposure**
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- Case study presentations on successful techniques to mitigate or transfer risks
  - How to defend yourself against claims, what data will assist legal counsel when an incident occurs?
  - Successful claims management through an understanding of regulations, all parties involved, who pays when there is a utility strike etc.
  - Review other project risks that should be mapped prior to design and construction of a project
- 2:30 – 3:30 pm**                    **Reduce Operational Costs while Protecting Assets with Efficient Utility 811 Ticket Management**
- 
- Efficient coordination with utility mark-out technicians
  - Obtaining a “positive response” and documenting the mark out
  - How to effectively communicate with all underground stakeholders?
  - Review new technologies changing the 811 in near future
  - **Latest edition of CGA best practices will be handed out to all attendees. Also, handouts from the respective states 811 offices will be provided as reference material during this session**
- 3:30 – 4:00 pm**                    **Networking Break**

# AGENDA

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MONDAY, NOVEMBER 13, 2017 | BOSTON, MA (CONTINUED)

MONDAY, DECEMBER 4, 2017 | HOUSTON, TX (CONTINUED)

**4:00 – 5:00 pm**

**Collecting, Recording & Managing Subsurface Data**

- Understand how underground utilities data varies depending on specific asset owners
- How to find and collect accurate and complete data during initial phase of the project?
- Identify risks associated with underground utility information depicted on existing survey, legal, and contract plans
- CAD vs. GIS records – what to look out for?
- Assess quality and reliability of underground utility plans
- How to manage and retrieve data when associated underground utilities do not want to share certain data?
- Best practices to systematically collect underground utility plans
- Manage risks associated with record keeping

**5:00 pm**

**Course Adjourns for the Day**

TUESDAY, NOVEMBER 14, 2017 | BOSTON, MA

TUESDAY, DECEMBER 5, 2017 | HOUSTON, TX

**8:00 – 8:30 am**

**Continental Breakfast**

**8:30 – 8:45 am**

**Opening Remarks**

**8:45 – 10:30 am**

**Understanding Locating Technologies & Associated Risks**

*\*Attendees will have hands-on experience with the instruments\**

- Various techniques used by locators
- Analyze accuracy, reliability and limitations of commonly used EMI systems
- Projecting performance and cost of EMI locating
- Discuss recent advancements on EMI cloud based data collection systems for tracking, documenting and risk management programs
- Laws pertaining to paint marking, risks associated with types of paint, and paint marking standards
- Cost-effective contracting for EMI locating services

**10:30 – 11:00 am**

**Networking Break**

**11:00 am – 12:30 pm**

**Optimizing Ground Penetrating Radar (GPR) & Accurate Data Interpretation**

*\*Attendees will have hands-on experience with GPR device\**

- GPR for utility detection and why will it fail under certain site conditions
- Case Study: Advanced utility detection and management with GPR (extensive subsurface mapping, GPS/Total station)
- Utility coordination - How and why do some firms use GPR while others do not
- How is GPR used in concrete scanning and what can GPR detect? Understand various GPR frequencies and why they matter
- Why do most underground asset owners and 'contract locate' providers do not use GPR?
- Finding analogies, tanks, vault and unidentified structures, rails, geology, and "surprise discoveries"?
- Understand types of deliveries derived from a GPR site investigation

**12:30 – 1:30 pm**

**Group Luncheon**

# AGENDA

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TUESDAY, NOVEMBER 14, 2017 | BOSTON, MA (CONTINUED)

TUESDAY, DECEMBER 5, 2017 | HOUSTON, TX (CONTINUED)

**1:30 – 2:30 pm**

## **Cost Estimation and Technology Considerations**

- Non-Invasive Remote -Sensing Technologies
  - o Terrain conductive systems, Infra-red mapping systems.
  - o The use of drones in underground utility detection and mapping – risks involved
- Non-Destructive Vacuum Excavation
  - o Importance of vacuum excavation for underground utility damage prevention
  - o Examine risks of vacuum systems – Impact of staff health, HR issues, CDL licenses etc.
  - o Use of vacuum excavation as a major risk mitigation measure for pre-excavation services on environmental and geotechnical investigations

**2:30 – 3:30 pm**

## **Project Planning for Subsurface Utility Mapping**

- Utility coordination
- Compiling all available public and private utility plans
- Establishing effective and thorough communication with all utility representatives and documentation
- Contracting methodologies for SUM services
- SUM project scope limits, scope definitions and project digital delivery files and its importance
- Methodology of SUM project demonstrated with example of cost breakdown, resource allocation, and a typical CAD file delivery

**3:30 – 4:00 pm**

## **Networking Break**

**4:00 – 5:00 pm**

## **Project Planning for Subsurface Utility Mapping (Continued)**

- How is utility information in a SUM project different from a surveyors' plan?
- Costs involved in 2D & 3D project deliverables
- Limitations of Subsurface Utility Mapping plan
- How Bluetooth enables devices, cloud based survey systems, LiDAR are changing SUM practices? Understand the risks involved
- Use of LiDAR in the SUM industry and how the delivery formats will be used in future augmented and virtual reality programs
- How SUM monies provide ROI when used in the project planning phase?
- Why subsurface utility mapping is an integral part of underground utility damage prevention program and how it lowers project risk?
- Discuss future of SUM services and emerging mobile mapping technologies

**5:00 pm**

## **Course Adjourns**

# INSTRUCTOR

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## Michael A Twohig

### Subsurface Utility Mapping Consultant

Michael A Twohig is a **Subject Matter Expert in the field of Subsurface Utility Mapping (SUM)** with over thirty years of industry experience including a focus on the integration of traditional utility locating procedures with Land Survey Best Practices associated with underground mapping. Michael's expert focus area is on Subsurface Utility Locating, 3D Utility mapping and Subsurface Utility Damage Prevention services.

Michael is **currently developing Multi-Sensor Mobile Mapping platforms using the next generation of Multi-Channel, Multi-Frequency Ground Penetrating Radar (GPR) system** for the Subsurface Utility Mapping industry. As a SUM practitioner Michael has worked on major projects in the US, Australia, India and Europe. Over the past 34 years he has **authored over 40 articles relating to Utility mapping**, Damage Prevention and Utility Industry Best Practices and is a frequent speaker at International conferences such as the Common Ground Alliance CGA, SPAR, Hexagon and the international lidar conference ILMF.

Michael has worked on the **development and implementation of new 3-Dimensional delivery files** for Geospatial projects, integrating Lidar, utility locating systems, Ground Penetrating Radar (GPR), Land Surveying and multi-sensor platforms to provide high quality, reliable and accurate data for CAD, GIS and BIM delivery format.

Organizations that benefitted from Michael's expertise include: **DGT Survey Group, Castle GPS, J.F.White, Trekk, and Massport (Boston airport authority through contracting since 1987).**

# LIST OF EQUIPMENT DISPLAYED

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- EMI Locating Equipment
- Radiodetection, RD 8000
- Radiodetection, RD 400
- Metrotech 810
- GPR - IDS Detector Duo
- Survey – Leica Electronic Total Station
- Historic Wild T2 Survey Total Station
- Lidar – FARO Terrestrial Laser Scanner

## REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

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Participants must sign in/out each day and be in attendance for the entirety of the course to be eligible for continuing education credit.

## INSTRUCTIONAL METHODS

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PowerPoint presentations and group exercises will be used in these events.

## PROCEEDINGS

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The proceedings of the course will be published, and one copy will be distributed to each registrant at the course.

## NOVEMBER EVENT LOCATION

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A room block has been reserved at the Hyatt Regency Boston, One Avenue de Lafayette, Boston, MA, 02111, for the nights of November 12-13, 2017. Room rates are US \$239 plus applicable tax. Call **1-617-912-1234** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is October 12, 2017 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

## DECEMBER EVENT LOCATION

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A room block has been reserved at the Houston Marriott West Loop by the Galleria, 1750 West Loop S West Loop South, Houston, TX 77027, for the nights of December 3-4, 2017. Room rates are US \$99 plus applicable tax. Call **1-713-960-0111** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is November 3, 2017 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

## IACET CREDITS

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EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

**EUCI is authorized by IACET to offer 1.3 CEUs for the course.**

## REGISTER 3, SEND THE 4TH FREE

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Any organization wishing to send multiple attendees to these courses may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

Please make checks payable to: "PMA"



# EVENT LOCATIONS

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# PLEASE SELECT

## SUBSURFACE UTILITY PROJECT MANAGEMENT & DAMAGE PREVENTION COURSE

- NOVEMBER 13-14, 2017 | BOSTON, MA: US \$1495  
EARLY BIRD on or before OCTOBER 27, 2017: US \$1295
- DECEMBER 4-5, 2017 | HOUSTON, TX: US \$1495  
EARLY BIRD on or before NOVEMBER 17, 2017: US \$1295

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

Print Name | Job Title

Company

What name do you prefer on your name badge?

Address

City | State/Province | Zip/Postal Code | Country

Phone | Email

List any dietary or accessibility needs here

## CREDIT CARD INFORMATION

Name on Card | Billing Address

Account Number | Billing City | Billing State

Exp. Date | Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx) | Billing Zip Code/Postal Code

**OR** Enclosed is a check for \$ \_\_\_\_\_ to cover \_\_\_\_\_ registrations.

### Substitutions & Cancellations

Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before October 13, 2017 in order to be refunded and will be subject to a US \$195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCL event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of course cancellation, EUCL's liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at (201) 871-0474.