Introductions

Moderator
Eric Cimo, P.E.
- Utility Engineer, Delaware Department of Transportation (DelDOT)

Speakers
Kenny Franklin
- Project Manager, Parsons Transportation

Cesar Quiroga, Ph.D., P.E., F.ASCE
- Senior Research Engineer, Texas A&M Transportation Institute (TTI)

James Anspach, P.G. (Ret), Dist.M.ASCE
- Global Senior Principal, Utility Engineering and Surveying Practice, Cardno
Session Agenda

- Utility coordination (Kenny Franklin)
- Status of web-based NHI course development (Cesar Quiroga)
- Utility investigations (Jim Anspach)
- Lessons learned from UCM courses around the country (Cesar Quiroga)
- Training needs (open forum)
Kenny Franklin
Project Manager
Parsons Transportation

UTILITY COORDINATION
Committee on Right of Way, Utilities, and Outdoor Advertising Control Annual Meeting, 2019

NHI 134006 – Utility Coordination

- Emphasis on establishing a utility awareness in all aspects of projects (cradle to grave)
- CCC
- Encourage an up to date utility accommodation policy
- Understanding 811 and utility investigations
Committee on Right of Way, Utilities, and Outdoor Advertising Control Annual Meeting, 2019

NHI 134006 – Utility Coordination

- Understand that good utility coordinators are aware of NEPA, permit commitments, and ROW
- Avoid, Minimize, Mitigate/Accommodate techniques
- Establishes the need for appropriate construction documents
- General discussion about UC and alternative contracting methods
Updates to 134006 for Consideration

• Adjust the course objectives to maximize content surrounding project design and construction
• Build more discussion and implementation of tools for avoidance and minimizing impacts
• Thorough discussion of appropriate collection and depiction of utility information—both existing and proposed
Updates to 134006 for Consideration

• Exchange existing with more current examples and illustrations
• Share examples of utility work plans and drawings
• Include an Implementation workshop
Cesar Quiroga, Ph.D., P.E., F.ASCE
Senior Research Engineer
Manager, Utility Engineering Program
Texas A&M Transportation Institute

STATUS OF WEB-BASED NHI COURSE DEVELOPMENT
Strategic Vision

• Paradigm shift from:
  Treating utilities as afterthought in project delivery

• To:
  Considering the utility process as an integral component that covers all phases of project delivery—starting as early as planning and continuing through schematic development, design, and construction
# Project Delivery Process

<table>
<thead>
<tr>
<th>Planning</th>
<th>Preliminary Design</th>
<th>Detailed Design</th>
<th>Letting</th>
<th>Construction</th>
<th>Post Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition, Selection, Financing, Sched.</strong></td>
<td><strong>Agreements, Scope Update</strong></td>
<td><strong>Environmental Process</strong></td>
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<td><strong>Property Acquisition and Relocation Assistance</strong></td>
<td><strong>Property Management</strong></td>
</tr>
<tr>
<td><strong>Alternative Analysis and Preliminary Plans</strong></td>
<td><strong>Right-of-Way Map Development</strong></td>
<td><strong>Design and PS&amp;E Assembly</strong></td>
<td><strong>15-20% design</strong></td>
<td><strong>Property Management</strong></td>
<td><strong>Letting</strong></td>
</tr>
<tr>
<td><strong>Environmental Process</strong></td>
<td><strong>Property Acquisition and Relocation Assistance</strong></td>
<td><strong>Right-of-way authorization</strong></td>
<td><strong>90% design</strong></td>
<td><strong>Construction</strong></td>
<td><strong>Construction authorization</strong></td>
</tr>
<tr>
<td><strong>Utility Coordination, Utility Investigation, Utility Conflict Management, Utility Design, and Utility Construction Management</strong></td>
<td><strong>Property Management</strong></td>
<td><strong>Environmental reevaluation</strong></td>
<td><strong>60% design</strong></td>
<td><strong>4</strong></td>
<td><strong>Letting</strong></td>
</tr>
<tr>
<td><strong>Planning linkages</strong></td>
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<td></td>
<td><strong>Construction</strong></td>
</tr>
</tbody>
</table>

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### Early utility coordination

- 0% design
- 15-20% design
- 30% design
- 60% design
- 90% design

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### Letting:

- 7

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### Construction:

- 6

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### Post Construction:

- Letting
- Construction
Utility Engineering Context

- Utility Engineering is a branch of engineering that focuses on the planning, design, construction, operation, maintenance, and asset management of any and all utility systems, as well as the interaction between utility infrastructure and other infrastructure.
Utility Engineering Context

Techniques and procedures for accommodating, permitting, managing, documenting, and assessing conditions of utility facilities within the right of way (including fee simple property and easements) over their entire lifecycle.

Technologies to detect, identify, and map existing utilities effectively and the integration of quality, standards-based utility information, including 3D modeling and building information modeling (BIM), in all phases of project delivery.

Techniques, protocols, and systems that use the avoid, minimize, and accommodate principle to identify and resolve conflicts systematically between infrastructure project features or phases and existing or proposed utility facilities.

Techniques and procedures that enable a more effective management of the utility process during all phases of project delivery, as well as a more effective coordination and contractual relationship between project owners and utility stakeholders.

Techniques and procedures for accommodating, permitting, managing, documenting, and assessing conditions of utility facilities within the right of way (including fee simple property and easements) over their entire lifecycle.

Techniques and procedures for building, monitoring, inspecting, and surveying utility installations at the job site, as well as mapping and production of quality, standards-based utility as-builds.

Techniques and procedures that lead to more effective practices to design utility relocations and protect-in-place measures for existing facilities that remain in place (including preparation of plans, specifications, schedule, and cost estimate).
# Related NHI Courses

<table>
<thead>
<tr>
<th>NHI No.</th>
<th>Title</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>134208</td>
<td>Utility Investigations</td>
<td>WBT</td>
</tr>
<tr>
<td>134209</td>
<td>Utility Conflict Management</td>
<td>WBT</td>
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<tr>
<td>134147</td>
<td>Preparing and Communicating Effective Utility Relocation Requirements</td>
<td>WBT</td>
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<tr>
<td>134210</td>
<td>Utility Data Management</td>
<td>WBT</td>
</tr>
<tr>
<td>134211</td>
<td>“Utility bundle” implementation planning</td>
<td>ILT</td>
</tr>
<tr>
<td>134006</td>
<td>Utility Coordination</td>
<td>ILT</td>
</tr>
</tbody>
</table>
Utility Investigations

Utility Investigation Methods
- Preliminary utility investigation
- Surveying of aboveground features
- Geophysical techniques
- Exposure of utility facilities

Outcomes and Deliverables
- Utility layout
- X, Y, Z locations
- Attribute data
- Metadata
- Test hole sheets
- Companion files

Utility Conflict Management (UCM)

Project Files
- Terrain features
- Project alignment and elevations
- Drainage design
- Traffic design
- Construction phasing
- Schedules
- Other

Utility Conflict Identification

Utility Conflict Resolution

Alternative Selection

Design Plans

Utility Conflict Resolution
- Utility conflict list
- Alternative analysis

Utility Design Plans
- Utility relocation plans
- Protect-in-place plans
- Schedules
- Cost estimates

Utility Data Management

Utility Coordination

Location
- Attributes
- Data quality
- Project datum

Committee on Right of Way, Utilities, and Outdoor Advertising Control Annual Meeting, 2019
NHI 134208 – Utility Investigations

- Terminal learning outcomes:
  - Identify the purpose of conducting utility investigations
  - Relate utility investigation activities to project delivery phases
  - Compare various utility investigation methods
  - Apply a risk-based approach to utility investigations
  - Identify typical utility investigation deliverables
NHI 134208 – Utility Investigations

- Research of Existing Records
- Documentation of Visible Utility Facilities
- Geophysical Techniques
- Exposure of Utility Facilities

Utility Investigation Methods
### NHI 134208 – Utility Investigations

#### Location Data
- X, Y
- Z (if required)
- Stations and offsets

#### Attribute Data
- Utility owner
- Utility type
- Depth
- Size and shape
- Encasement
- Configuration
- Operational status
- Age/installation date
- Condition
- Material type
- Investigation dates
- Pressure
- Tracer wire
- Voltage
- Metadata

#### Project Datum
- Horizontal datum
- Vertical datum
- U.S. National Spatial Reference System (NSRS)

#### Quality Levels
- QLD
- QLC
- QLB
- QLA

#### Legend and Symbology
- Line type
- Line weight
- Line color
- Symbol
- Labels
- Notes
- Utility legend
- Layer or level

---

*3D visualization and animation (if required)*
NHI 134208 – Utility Investigations

• Status:
  ▪ Learning outcomes and outline
  ▪ Course design plan
  ▪ Storyboards
  ▪ Prototype
  ▪ Alpha
  ▪ Pilot
  ▪ Soft launch
Utility Investigations

- Preliminary utility investigation
- Surveying of aboveground features
- Geophysical techniques
- Exposure of utility facilities

Outcomes and Deliverables

- Utility layout
- X, Y, Z locations
- Attribute data
- Metadata
- Test hole sheets
- Companion files

Utility Conflict Management (UCM)

- Project Files
  - Terrain features
  - Project alignment and elevations
  - Drainage design
  - Traffic design
  - Construction phasing
  - Schedules
  - Other

- Utility Conflict Identification

- Utility Conflict Resolution

- Alternative Selection

- Design Plans
  - Utility design plans:
    - Utility relocation plans
    - Protect-in-place plans
    - Schedules
    - Cost estimates

Utility Data Management

- Location
- Attributes
- Data quality
- Project datum

Utility Coordination
Terminal learning outcomes:
- Identify the need for conducting effective UCM
- Explain how UCM activities may affect project delivery
- Describe the key elements for effective UCM
- Identify the key requirements for UCM implementation
- Explain how UCM outputs are incorporated into contract documents
### Utility Coordination

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<td>Project Management</td>
</tr>
</tbody>
</table>

- Early utility coordination
- Environmental approval
- Environmental reevaluation
- Right-of-way authorization
- Property Management

**Timeline:**
- 0% design
- 15-20% design
- 30% design
- 60% design
- 90% design
- Construction
- Letting
- Post Construction
NHI 134209 – Utility Conflict Management

• Status:
  ▪ Learning outcomes and outline
  ▪ Course design plan
  ▪ Storyboards
  ▪ Prototype
  ▪ Alpha
  ▪ Pilot
  ▪ Soft launch
Utility Investigations

- Preliminary utility investigation
- Surveying of aboveground features
- Geophysical techniques
- Exposure of utility facilities

Outcomes and Deliverables

- Utility layout
- X, Y, Z locations
- Attribute data
- Metadata
- Test hole sheets
- Companion files

Utility Conflict Management (UCM)

- Terrain features
- Project alignment and elevations
- Drainage design
- Traffic design
- Construction phasing
- Schedules
- Other

Project Files

- Utility conflict list

Utility Conflict Identification

Utility Conflict Resolution

Alternative Selection

Design Plans

Utility Design Plans:
- Utility relocation plans
- Protect-in-place plans
- Schedules
- Cost estimates

Utility Data Management

- Location
- Attributes
- Data quality
- Project datum

Utility Coordination

NHI 134209

NHI 134208

NHI 134210

NHI 134006

NHI 134147
NHI 134147 – Preparing and Communicating Effective Utility Relocation Requirements

• Differentiate effective supporting documents (utility relocation plans, utility relocation cost estimates, and utility relocation schedules) from ineffective supporting documents in a utility agreement
• Evaluate the effectiveness of a utility agreement
• Differentiate effective utility statements from ineffective utility statements
• Evaluate the effectiveness of utility information in construction bid packages
<table>
<thead>
<tr>
<th>Document/Deliverable</th>
<th>Information Requirement</th>
<th>Information Category</th>
<th>Information Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility relocation plans</td>
<td>Required</td>
<td>Location</td>
<td>Location of existing (in use and out of service) utility installations. Location of proposed utility installations (where the relocated facilities will be placed). Stations and offsets to highway control baseline or coordinates based on the highway project datum. Utility conflicts, including those with project features and construction phases. Measures to protect in place. Elevations of utility facilities at critical points.</td>
</tr>
<tr>
<td>Utility relocation plans</td>
<td>Required</td>
<td>Attributes</td>
<td>(To the extent that they apply to the specific utility agreement) Type. Size. Class. Material. Capacity. Pressure requirements. Wall thickness. Anode beds. Number and size of cables and conduits. Protective devices.</td>
</tr>
<tr>
<td>Utility relocation plans</td>
<td>Required</td>
<td>Depiction and visualization</td>
<td>Dimensions of utility structures, particularly when elements are not to scale. Symbology and legend used to depict: • Existing and proposed utility facilities • Conflicts with highway features or elements</td>
</tr>
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</tr>
<tr>
<td>Utility relocation plans</td>
<td>Required</td>
<td>Other elements</td>
<td>Quantities. Notes. Additional instructions that: Facilitate understanding of the relocation work. Help with development of schedule and cost estimate.</td>
</tr>
<tr>
<td>Utility relocation plans</td>
<td>Enhancement</td>
<td>Location</td>
<td>Distinction of utility relocation work on private and public right of way. Existing and proposed highway right of way. Existing and proposed utility right of way. Control of access lines and corresponding highway station locations. 3D models of existing and proposed utility installations. Test hole location identification with corresponding table.</td>
</tr>
<tr>
<td>Utility relocation plans</td>
<td>Enhancement</td>
<td>Additional elements</td>
<td>Excavation and fill zones. Overhead spacing requirements. Work phase details, including coordination and conflict management with highway work phases. Traffic control and safety drawing. Environmental mitigation plans, including storm water pollution prevention plan (SWPPP).</td>
</tr>
<tr>
<td>Utility relocation schedule</td>
<td>Required</td>
<td>All</td>
<td>Organized into manageable, logical phases. Activities and durations. Advance notice(s) to the utility owner. Required work by others (prep interim and finish). Access restrictions for highway contractor. Coordination with other utility owners and stakeholders.</td>
</tr>
<tr>
<td>Utility relocation schedule</td>
<td>Enhancement</td>
<td>All</td>
<td>Special provisions. Assumed duration for work by other stakeholders. Bar chart schedules.</td>
</tr>
<tr>
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<td>Information Element</td>
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</table>
| Utility relocation cost estimate     | Required                | Unit cost method              | Supported by recent, actual expenditures. Updated periodically. Supported annually by a maintained database of utility relocation expenses. Agreed upon in the form of a master agreement between the State and utility that includes the following components:  
  - Agree to use unit cost method  
  - Identify common pay items  
  - Develop specifications and unit costs that account for:  
    - Scope and description of the activity  
    - List of payable items associated with the activity  
    - Unit of measurement for each item  
    - Method to measure item  
    - List of subsidiary items not payable separately |
<p>| Utility relocation cost estimate     | Required                | Lump sum payment option       | Detailed relocation plans. Detailed work schedule. Detailed cost estimate. |</p>
<table>
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</thead>
</table>
| Construction bid package | Required                | Utility relocation plans     | Show utilities that:  
- Remain or need to be protected in place  
- Were relocated prior to letting  
- Will be relocated during construction  
- Will be put out of service  
Include symbology for all utilities.  
Identify excavation/fill zones and overhead spacing requirements.  
Include access availability requirements for highway contractor. |
| Construction bid package | Required                | Utility relocation schedule  | Detailed activities (highway contractor and utility owners) by phase and location of work to ensure integration with the highway construction.  
Durations, start and end dates, and sequence for all activities.  
Requirements for and coordination with all relevant stakeholders.  
Preparation work that must be completed prior to the utility relocations.  
Access availability requirements for highway contractor. |
| Construction bid package | Required                | Utility conflict list        | Known utility conflicts and their resolution.  
Outstanding utility relocations, if applicable.  
Utility owner contact information. |
| Construction bid package | Required                | Special provisions          | Scope of utility relocations and effect on the highway project.  
Requirements for notification to appropriate agencies, including One Call.  
Requirements for utility coordination and corresponding documentation that include:  
- Notices and notifications  
- Meeting minutes  
- Test hole results |
NHI 134147 – Preparing and Communicating Effective Utility Relocation Requirements

• Status:
  ▪ Learning outcomes and outline
  ▪ Course design plan
  ▪ Storyboards
  ▪ Prototype
  ▪ Alpha
  ▪ Pilot
  ▪ Soft launch
Utility Investigations

• Preliminary utility investigation
• Surveying of aboveground features
• Geophysical techniques
• Exposure of utility facilities

Outcomes and Deliverables

• Utility layout
• X, Y, Z locations
• Attribute data
• Metadata
• Test hole sheets
• Companion files

Utility Conflict Management (UCM)

Project Files

• Terrain features
• Project alignment and elevations
• Drainage design
• Traffic design
• Construction phasing
• Schedules
• Other

Utility Conflict Identification

Utility Conflict Resolution

Alternative Selection

Design Plans

Utility Coordination

• Utility relocation plans
• Protect-in-place plans
• Schedules
• Cost estimates

Utility Data Management

• Location
• Attributes
• Data quality
• Project datum

NHI 134208

NHI 134209

NHI 134210

NHI 134217

NHI 134147

NHI 134006
NHI 134210 – Utility Data Management

Utility Data Repository

Utility Investigation → Utility Conflict Management → Utility Design → Utility Construction Management

Highway Construction Project
- Planning/Preliminary Design → Design → Construction

Corridor Operations and Maintenance
- Maintenance Permit Review, Approval, and Utility Installation
Committee on Right of Way, Utilities, and Outdoor Advertising Control Annual Meeting, 2019

NHI 134210 – Utility Data Management

Conduct utility investigation

- Utility plan sheets
- Utility layout
- Utility test hole sheets
- Utility report
- Field notes
- Data files
- 3D model

Identify, analyze, and resolve utility conflicts

- Utility conflict list
- Utility plan sheets
- Utility layout
- Project files
- Schedules
- Cost estimate

Conduct utility design

- Utility relocation plans
- Work schedule
- 3D model

Install new facility

- Redlined plans
- Field notes
- Data files

Conduct inspections

- Utility plan sheets
- Utility layout
- 3D model
- 3D visualization

Prepare utility as-buils

Includes disposition of old facility in conflict

Extract and validate utility facility data

Update utility data repository

Utility data repository
NHI 134210 – Utility Data Management

- Terminal and enabling learning outcomes:
  - Explain how effective utility data management can improve business practices
  - Identify the differences between 2D and 3D utility design environments
  - Identify inputs and outputs for all pre-construction and post-construction phases
  - Compare typical IT requirements for managing utility data in a 3D design environment
NHI 134210 – Utility Data Management

• Status:
  ▪ Learning outcomes and outline
  ▪ Course design plan
  ▪ Storyboards
  ▪ Prototype
  ▪ Alpha
  ▪ Pilot
  ▪ Soft launch
James Anspach, PG (Ret), Dist.M.ASCE
Global Senior Principal
Utility Engineering and Surveying Practice
Cardno

Lawrence Arcand, P.E.
UES Area Manager - Cardno

UTILITY INVESTIGATIONS
SUE Professional

- A training and certification and credentialing program designed for those who are sealing ASCE 38 Deliverables. Those individuals taking the course who do not have a professional license may receive the certificate but not the credentials.

- A major component of this program is based upon the 40 hour Louisiana Tech SUE for Professionals Course, now in its 5th year, scheduled for the First Week of March 2020. Approx 150 persons have taken this course and received credit.

- It is anticipated, and developed in such as way, that Agencies may use this credentialing program as a means for prequalification criteria for SUE consultants.
### Committee on Right of Way, Utilities, and Outdoor Advertising Control Annual Meeting, 2019

#### Last Year’s Flyer

**NEXT YEAR’S DATES:**

Mar 2nd-6th

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<table>
<thead>
<tr>
<th>OBJECTIVE:</th>
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<tbody>
<tr>
<td>The Trenchless Technology Center (TTC) at Louisiana Tech University in conjunction with the ASCE’s Utility Engineering and Surveying Institute (UESI) have teamed to hold the 4th TTC UIS School in 2019. This short course will give practitioners the knowledge and tools to provide competent utility investigations in accordance with accepted national standards (ASCE 38) and to defend against claims through this knowledge and its documentation. In addition to the classroom lectures, practical sessions will be held where participants will be offered hands-on experience with the GPR, PCL, and etc. This 5-day school will be taught by the foremost experts in the geophysics and subsurface utility engineering field. This 5-day school has been designed for</td>
</tr>
<tr>
<td>• Engineers and surveyors and project managers providing deliverables that include results and depictions of utility investigations. • Consulting engineers, Employees of utility companies, state DOTs and local highway agencies, regulatory agencies, local governments, etc.</td>
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</tbody>
</table>

At the end of this short course, students will receive 3 CEUs /40 PDHs and a Certificate of Completion.  

<table>
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<th>Registration Fee</th>
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<tbody>
<tr>
<td>$1,595</td>
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<tr>
<td>$1,495 EARLY REGISTRATION (Ends Jan 15)</td>
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<tr>
<td>$1,345 SUPER SAVER (Ends Nov 10)</td>
</tr>
<tr>
<td>Additional 10% discount for 3 or more attendees from same company.</td>
</tr>
</tbody>
</table>

| Date: |
| February 25 to March 1, 2019 |

| Time: |
| 8:00 am – 5:00 pm Daily |

| Location: |
| Louisiana Tech University, Ruston, LA |

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**Course Director**

Tom Iseley, Ph.D., P.E., Dist. M. ASCE, PWAM  
CTF Professor, Civil Engineering  
Eminent Scholar Chair in Construction  
Trenchless Technology Center  
Assoc. Director, International Operations  
Louisiana Tech University  
Director, UNITRACE International  
Adjunct Professor, Xi’an Jiaotong University, China  
CELL: (404) 386-5667  
Email: dtiseley@latech.edu

**Primary Instructor**

Jim Anspach, PG(r), Dist.M.ASCE  
ASCE/UESI President 2018  
Member-EJDC  
Cardno Inc. Global Senior Principal  
Chair ASCE-38  
Chair – Construction Standards Council  
Email: James.Anspach@Cardno.com

**Registered**

For registration or having additional questions, please email Saleh, sb013@latech.edu  
Or call: 318.257.4072
Alexis Isenberg, PE (Cardno – Pittsburgh, PA) Holds her new Certificate

Variety of Tools on display
Subsurface Utility Designator

- A training and certification and credentialing program designed for those who are using surface geophysical methods in order to search for and identify any and all types of utilities in any environment.
- This program is under development but anticipated to involve considerable study, OTJ instruction, testing, and time in field to collect all the necessary experiences. This could very well be a 2 year Community College type degree course, with input from the US Dept of Labor and Veterans Administration.
- There is an anticipated Board that will be able to evaluate and vet existing SUE firm training and certification programs, if those programs meet certain specifications and audit parameters.
- It is anticipated, and developed in such as way, that Agencies may use this credentialing program as a means for prequalification criteria for SUE consultants.
Consensus was reached that a good approach to certification might be to:

1. Identify training elements necessary for Designators (the body-of-knowledge to be obtained)
2. Identify whether different “Levels” of Certification are necessary
3. Evaluate SUE Company internal training programs for content and delivery requirements
4. Engage SUE companies in determining the need and value of the certification
5. Develop some testing mechanisms
6. Develop a “Certification Body” (Could be CEC or different entity)
7. Develop value statement for Designators and Subsurface Utility Engineering practice and determine “Pricing” potential

Recommendations:

1. Identify TF membership needs
2. Reconstitute Task Force on Designator (subset of Engineering Technician) Certification
3. Develop Governance concepts
4. TF to prepare a proposal for UESI Board consideration
Cesar Quiroga, Ph.D., P.E., F.ASCE
Senior Research Engineer
Manager, Utility Engineering Program
Texas A&M Transportation Institute

LESSONS LEARNED FROM UCM COURSES AROUND THE COUNTRY
## SHRP2 Implementations

<table>
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One-Day UCM Training Course

- District highway project:
  - 60-90% design complete
  - 2-3 miles long
- Documentation used:
  - Plan views
  - Profiles
  - Cross sections
  - Drainage plans and profiles
  - Existing utility layouts
  - Utility test hole sheets
  - UCM utility conflict list template
  - UCM utility conflict resolution analysis template
One-Day UCM Training Course

- 70+ UCM courses offered
- 2,500+ participants
  - Project managers
  - Designers
  - Utility engineers and coordinators
  - Consultants (both DOT and utility)
  - Utility owners
  - Construction managers
  - Surveyors
  - ROW agents
Lessons Learned

• High level of satisfaction with the course
• Huge need for this kind of training
• Hands-on exercise
  ▪ Work in groups
  ▪ Actual project
  ▪ Oral reports
Lessons Learned

• Target project managers and designers
  ▪ Skepticism before taking the course
  ▪ Presumption that UCM is responsibility of utility coordinators
  ▪ Increased awareness of UCM after taking the course
  ▪ More project managers and designers should take the course
  ▪ Requirement for prequalification of consultants
Lessons Learned

• Increased awareness of the project delivery process
  - Utility owners not familiar with project delivery process
  - DOT officials not (sufficiently) familiar with project delivery process
  - UCM focuses on early utility coordination
  - What is “early”?
Lessons Learned

• Need to improve utility data management practices
  ▪ Utility investigation timing, scope, quality, and completeness
    ❖ Frequently inadequate to identify conflicts
    ❖ Locations, but not size, capacity, or operational characteristics
  ▪ Mapping and documentation of utility data on projects
    ❖ Design files show utility locations, but other utility investigation deliverable info is removed to limit clutter
    ❖ Information lost to subsequent users, including contractors
  ▪ Utility conflict locations on project files
    ❖ Utility conflict lists are common
    ❖ Layouts showing utility conflicts are not common
U15B utility conflict list is a good reference
- Importance of consistency and standardization
  - Use standard template
  - Information exchange vs. "behind the scenes" management
  - Layouts to show utility conflict locations
  - Utility conflict analysis at important milestones

Lessons Learned
- Alternative Analysis and Preliminary Plans
- Environmental Process
- Utility Coordination
- Utility Investigation
- Utility Conflict Management
- Utility Design
- Utility Construction Management
- Property Acquisition and Relocation Assistance
- Design and PS&E Assembly
- Letting
- Construction
- Post Construction
TRAINING NEEDS (OPEN FORUM)