Utilities & the Transportation Project…… Observations, Lessons Learned, & Useful Tools.

Ideas for Today and Tomorrow…
Why We Are Here

- Utility Issues continue to be a major obstacle......adversely impacting cost and schedules.
Why Prioritize Utilities….

• Utilities often determine project success or failure.
• Have least control over one of the more critical design components.
• Selection of Design Team by choice, Utility Team members are given.
• Proximity of Work Environment….
  ➢ *Highway, Traffic, Survey, Structures,* ….”under one roof”
  ➢ *Utilities, electric, gas, communications, water, sanitary, etc.* ….”off premises”

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Why I’ve Stayed Involved…… over the years

- Success as a Project Manager required success with utilities
- Diversified Work
- Desire to find Solutions
- Over the years has become a “Passion”
Experience & Background…..

Career focus in 3 areas:

- **Transportation Projects** — Project Manager and Technical Design Leader on Transportation Agency Projects
- **Utilities** — Project Manager and Technical Lead on Utility Company Projects.
- **Project Management** — PMP (PMI) and CQIA (ASQ)
  - Recently led the re-write of the NJ State Utility Accommodation Policy
  - PM on several NJDOT Utility Process Improvement & Utility Constructability Review Term Agreements

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A Unique Perspective….

Serve “Both Sides of the Fence”

✓ Project Manager/Designer on Multi-Disciplined DOT Transportation Projects

✓ Utility Company Consultant/Designer – Reviewing Verification Plans, Conflict Evaluations, Relocation Schemes, Designing Utilities…

Created an environment of mutual trust and understanding

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Today's Discussion Topics

• Historical Perspective ..... *How each of the Stakeholders see it*

• Observations ..... *Perception vs. Reality*

• Understanding the Issues ..... *Lessons Learned*

• “Bridging the Gap” ..... *Fixing the Problems*
Historical Perspective

• How Transportation Agencies see it....
• How Utility Companies see it.....
• How Consultants see it.....
Historical Perspective

How Transportation Agencies see it….

- Excessive costs
- Schedule Delays
- Uncooperative/Unresponsive
- Outside Negative Influence
Historical Perspective

How Utility Companies see it…..

- Use of Company Limited & Specialized Resources
- Unrealistic Schedules
- Specialized Technical Expertise
- Utility Requirements/Criteria not Considered
Historical Perspective

How Consultants see it.....

- **Non-Technical Discipline** – Typically delegated to Junior Level Staff
- **An Administrative Phase Requirement**
- **Independent Design** – By Others
- **Low Priority**
- **Not “Sexy” – Boring**
- **No Positive Advantage towards Career Path**
Historical Perspective

How Consultants see it…..

- **Non-Technical Discipline – Typically delegated to Junior Level Staff**
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- **No Positive Advantage towards Career Path**
How we see it... *through* Observations, Discussions, & Lessons Learned
Observations…

Perception…..

➤ Utility Orders/Agreements executed, therefore, transportation and utility designs compatible.

Reality…..

➤ Executed Utility Orders/Agreements verify current process has been followed. Doesn’t ensure a constructible project.
Observations...

Perception.....

➢ Utility Construction will follow the highway construction staging.

Reality.....

➢ Often Utility Construction drives the highway construction staging & sequencing.
Observations…

Perception…..

- Utility work in the highway construction contracts will solve the problem.

Reality…..

- Utility work in the highway construction contract is an excellent end result….
  however, the required utility construction staging is often not properly integrated.
Observations....

Perception.....

➢ Solve the problem by advancing the utility work.

Reality.....

➢ Often advancing utility work requires more than clearing and grubbing such as significant rough grading, etc.

Utility poles installed in area of future 5’ fill

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Observations....

Perception.....

- **Utility Company Incentives are monetary.....**

Reality.....

- **Showing a commitment to minimize utility relocations and efficient use of utility crews are highly recognized incentives.**
Observations....

Perception.....

➢ A utility conflict is identified when there is a “direct hit”

Reality.....

➢ Very often “Indirect” utility conflicts are the cause of costly and time consuming construction field problem....subgrade compaction, temporary sheeting, construction vibrations, unstable cast iron utility, utility staging, etc.
Observations....

Perception.....
➢ Utility Companies are uncooperative.

Reality.....
➢ Utility Representatives are cooperative
  …unanticipated "avoidable" construction
  problems lead to frustration.

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Observations....

Perception.....

- Transportation Agencies are unrealistic

Reality.....

- Transportation Agency Representatives follow an established Utility Process...
  unanticipated "avoidable" construction problems lead to frustration.

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Observations....

Perception.....

➢ Utility Companies are delaying the project.

Reality.....

➢ An unanticipated “utility related” field issue, not properly identified during design, is the cause of project delay.

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Observations….

EXAMPLES
Construction Staging & Sequencing

**Problem:** Roadway and utility construction staging not compatible

**Consequences:** Construction delay, temporary utility tie-ins, multiple unanticipated utility mobilizations, additional cost.

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**Problem:** Roadway and utility construction staging not compatible

**Consequences:** Construction delay, temporary utility tie-Ins, multiple unanticipated utility mobilizations, additional cost.

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Construction Staging/Advanced Utility Work

Problem: Utility relocation work can not be advanced due to significant grade changes.

Roadway Construction Stage I Work Zone

- Stage I Construction Work Zone
- Advanced utility work not feasible
“Indirect Utility Conflicts”

50 Year Old CI Main

2’ – 3’ Clearance

- SUE verify conflict
- SUE verify no conflict
- Indirect Conflict Area

Construction activity near cast iron pipe can have adverse impact

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“Indirect Utility Conflicts”

Existing cast iron pipe within angle of repose will likely be a “conflict” in the field during construction.
"Cut over" strategies

Problem: Sequencing and MPT for utility cut-overs. Often, existing & proposed utility pipe must be active concurrently to cut – over live services.
DESIGN COORDINATION AND CONSTRUCTION STAGING

PLAN – NORTHBOUND
DESIGN COORDINATION AND CONSTRUCTION STAGING

STAGE 1

STAGE 2

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Utility innovation

Innovation: Roadway widening results in pipe under traveled way – no other conflict.

Benefit: Cost savings, no traffic disruption for future “tie ins” or system expansion

- Widened roadway section

Typical stub for future utility expansion

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Understanding the Issues

What we have determined…..

✓ Transportation Agencies and Utility Companies share similar goals and objectives…

• Agencies…..”Complete the construction to service their users”

• Utility Companies…..”Complete the relocations, to free-up their Resources, to service their customers”
Understanding the Issues

What we have determined…..

✓ Transportation Agencies and Utility Companies share similar goals and objectives…

• Efficient use of Resources
• Cost effective Solutions
• Avoidance/Minimiztion of Utility Relocations
• Reduction in “Unanticipated” Field Problems
• Continuation of System Integrity
• Time…Time…Time
Understanding the Issues

What we have determined…..

✓ Transportation Agencies and Utility Companies each have their own unique set of Standards and Requirements which must be followed.
Understanding the Issues

Executed Utility Order/Agreement Confirms.....

Consultant has met the Agency’s Design Phase Utility Requirements.....DONE THE RIGHT THING
Understanding the Issues

Executed Utility Order/Agreement Confirms…..

*Utility Company* has met the applicable Requirements and deems the proposed Utility Relocation work acceptable…..*DONE THE RIGHT THING*
Understanding the Issues

Executed Utility Order/Agreement Confirms…..

Agency has met it’s Requirements and deems the proposed Utility Relocation work acceptable…..DONE THE RIGHT THING

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Understanding the Issues

Final Result:
The RIGHT Transportation Design…
The RIGHT Utility Process…
The RIGHT Utility Design…

STILL PROBLEMS!

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Understanding the Issues

If everyone is doing the RIGHT thing, and there are still problems, the following must be true:

• *Process Related Issue NOT People Issues* &

• *Must be an Absence of “Cross-Discipline” Technical Knowledge between the Transportation & Utility Industries*
Understanding the Issues

What we have determined.....

- Current Utility Processes often do not fix the problem....


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Understanding the Issues

Often the Utility effort is an Administrative Process

*Engineer is a…*

“Utility Process Administrator”
Understanding the Issues

What we have determined.....

Solution is to “bridge the Technical gap” between the DOT and Utility industry.

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To Bridge the Gap.....

Transportation Project

Utilities within Project Limits

Subsurface Utility Engineering

Excellent Advancement the past years

Successful Project

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To Bridge the Gap.....

- Transportation Project
- Utilities within Project Limits
- Subsurface Utility Engineering
- Utility Technical Discipline Void
- Successful Project

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2012 AASHTO Subcommittee on Right of Way and Utilities Conference
Marriott Waterfront Hotel – Portland, Oregon
April 29 to May 3, 2012

Where Tradition and Transformation Converge
To Bridge the Gap…..
Address the Utility Technical Discipline void

✓ Must Understand BOTH Agency and Utility Needs
✓ Be Knowledgeable in BOTH Agency and Utility Company Policies, Procedures, & Requirements
✓ Have "Cross Discipline” Design Experience in BOTH Transportation & Utilities
✓ Experienced in Identifying, Prioritizing, & Mitigating Risks for BOTH Transportation & Utilities

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To Bridge the Gap.....

Address the Utility Technical Discipline void

✓ Have a Design understanding of ....
  ...highways, drainage, structures, traffic, ROW, etc.

✓ Experience in resolving Utility Field Construction Issues

✓ Ability to perform Constructability Reviews involving BOTH Transportation & Utilities

✓ Understand Construction Staging & Sequencing constraints for BOTH Transportation & Utilities

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To Bridge the Gap.....

Address the Utility Technical Discipline void

✓ Ability to Establish Relationships, based on Mutual Understanding & Trust

✓ Ability to Recognize Time & Cost Innovative Utility Solutions

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To Bridge the Gap.....

Need to Recognize Transportation Agency Constraints & Priorities.....

• Design Constraints – Numerous Design Disciplines
• Cost
• Schedule
• Permitting
• Environmental
• Construction Staging & Sequencing
• Multiple Agency Involvement
• Political

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To Bridge the Gap…..

Need to Recognize Utility Constraints & Priorities…..

• Design Constraints
• Existing Condition/System Integrity
• Outages & Emergencies
• Material Availability – Ordering Lead Times
• Resources - Crew Availability
• Seasonal Restrictions
• Utility Staging & Sequencing
• System Shut-down Constraints
• Tie-in Constraints
RECOMMENDATIONS

I. Recognition of UTILITIES as a Technical Design Discipline.

II. Identify and Implement Utility Process Improvement Solutions during the Project Design Phase.


IV. Initiate Utility Training Program.

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RECOMMENDATIONS

I. Recognition of UTILITIES as a Technical Design Discipline... the strategic foundation for future success and career path to develop future utility experts.

II. Identify and Implement Utility Process Improvement Solutions during the Project Design Phase.


IV. Initiate Utility Training Program.

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RECOMMENDATIONS

I. Recognition of Utilities as a Technical Design Discipline:
   - Highways
   - Structures
   - Traffic
   - Drainage/Stormwater Management
   - Environmental
   - Survey
   - UTILITIES
RECOMMENDATIONS

Requiring Expertise in:

- Utility Constraints Identification,
- Utility Risk Identification & Mitigation,
- Utility Company Requirements,
- Utility Engineering,
- Integration of Utility Construction Staging & Sequencing
- Understanding of Highway, Structural, Drainage, Traffic, ROW, and Environmental Design Disciplines.
RECOMMENDATIONS

Recommendation I: Recognize Utilities as a Technical Design Discipline.

Implementation:
- Immediate Recognition/Long Term Program
- DOT, Consultant, & Utility Partnership to develop Training Modules

Suggested Action:
- Change the Culture from a negative to one of “Recognition of Utility Excellence”
- “Utility Coordinator” Certification
- Utility Engineering Training Program – Technical Content

Utility Training Program & Certification become Requirements for Solicitations involving extensive utilities – Incorporate a “Utility” Prequalification Requirement.
II. Implement Utility Process Improvements

- Utility Technical Memorandum (Requirements Checklist); Technical Utility Requirements to be addressed prior to advancing to next design phase - Design Task

- Enhanced Utility Verification Process; Age, Material, etc. – Design Task

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RECOMMENDATIONS

II. Implement Utility Process Improvements…..

- Utility Constraints Identification and Mapping – Design Task

- Utility Constraints/Risk Plan – Contract Document

- Utility Risk Identification and Mitigation – Design Task

- Utility Staging & Sequencing Contract Plan – Contract Document
II. Implement Utility Process Improvements

- Utility Constructability Phase Review Meetings, Utility and Design Representatives – Design Task

- Maintain utility consistency throughout the project lifecycle - Assign a Utility Construction Coordinator – Construction Phase
RECOMMENDATIONS

Recommendation II: Utility Process Improvement Solutions.

Implementation:
- Immediate
- Implement any of the Tools.
- Utilize a Utility Task Order Agreement

Suggested Tool Kit:
- Utility Technical Memo’s – Phase Submissions
- Utility Constraints/Risk Plan
- Utility Construction Staging & Sequencing Plans
- Assign Utility Construction Coordinator – Thru Design and Construction Phases
RECOMMENDATIONS

III. Perform Independent Utility Design/Constructability Reviews on:

- High Risk Projects

- During Critical Milestones of Design Development.
RECOMMENDATIONS


Implementation:
- Immediate
- High Risk Utility Projects
- Utilize Utility Constructability Review Term Agreement

Tool Kit:
- Assign Experienced Technical Highway & Utility Staff
- Develop Utility Constructability Checklists

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2012 AASHTO Subcommittee on Right of Way and Utilities Conference
Marriott Waterfront Hotel – Portland, Oregon
April 29 to May 3, 2012
IV. Initiate Utility Training Program:

*Purpose:*

- Implement Utility Concepts
- Consistency in Process
- Consistency in Information
- Cost effective Resolution/Avoidance of Conflicts
- Reinforce Commitment to the importance of Utilities
RECOMMENDATIONS

IV. Initiate Utility Training Program:

Training Content:

- Utility Design Criteria and Requirements
- Utility Coordination Procedures/Process
- Utility Construction Management
- Utility Billing Process
- Communications/Negotiations
- Legal Issues
RECOMMENDATIONS

IV. Utility Training Program:

Added Benefits:

- Mechanism for Continuous Improvement

- Reinforces Commitment to the importance of Utilities
## RECOMMENDATIONS

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<th>Recommendation IV:</th>
<th>Tool Kit:</th>
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<td><strong>Utility Training Program.</strong></td>
<td><strong>Training Course Modules involving -</strong></td>
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<td><strong>Implementation:</strong></td>
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<tr>
<td>- Commence Immediately/Long Term Implementation Schedule</td>
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Benefits

Most Importantly…Promotes the Utility Engineering Profession

Creates a fully recognized discipline that leads to a rewarding “Utility Technical Career Path” for young Engineers.

Mr. Campbell said it best at last year’s AASHTO Conference …”prepare for who is coming next!”

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Comments & Questions