Maximize Success with Early Utility Coordination

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Discussion Points

- The Research
- The Reasons
- The Road to Implementation

Research—Findings

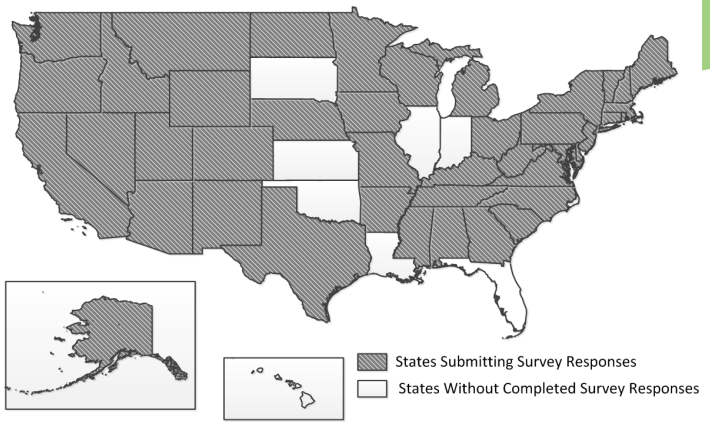
- KYTC SPR 13-460

Top Ten Considerations for Expediting Utility Relocations

1. Early Utility Involvement
2. Communicate & Coordinate Actively (multiple areas)
3. Put a Utility Expert on the Team
4. Use SUE (requires thorough understanding)
5. Training (utilities in highway design & vice versa)
6. Electronic Utility Tracking *See KURTS
7. Use Utility Corridors/Duct Banks (when appropriate)
8. Consider Utilities in ROW Acquisition
9. Avoidance (have to know where they are!)
10. Reimbursement for early relocation (use with care)

Research—Findings

- NCHRP Synthesis 506

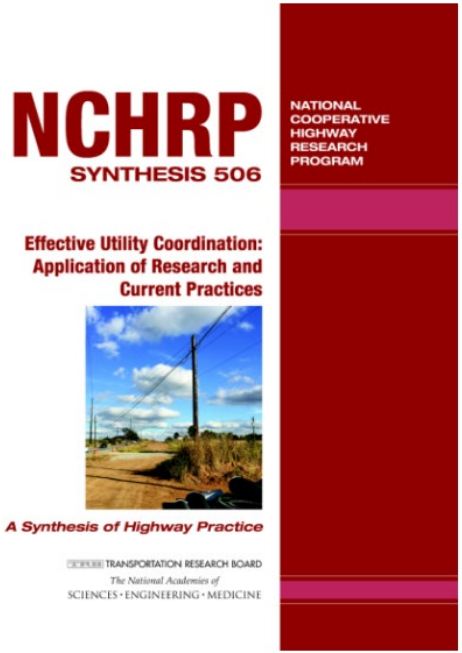


Overview

- National STA(DOT) Survey 84% Response Rate
- Non-STA Survey 29 Responses (16 Utility Owners)
- Interviews w/Kentucky, Maryland, Utah, Virginia, Washington, & Wyoming

Research—Findings

- NCHRP Synthesis 506



"At what point…does the utility coordination process typically begin?"

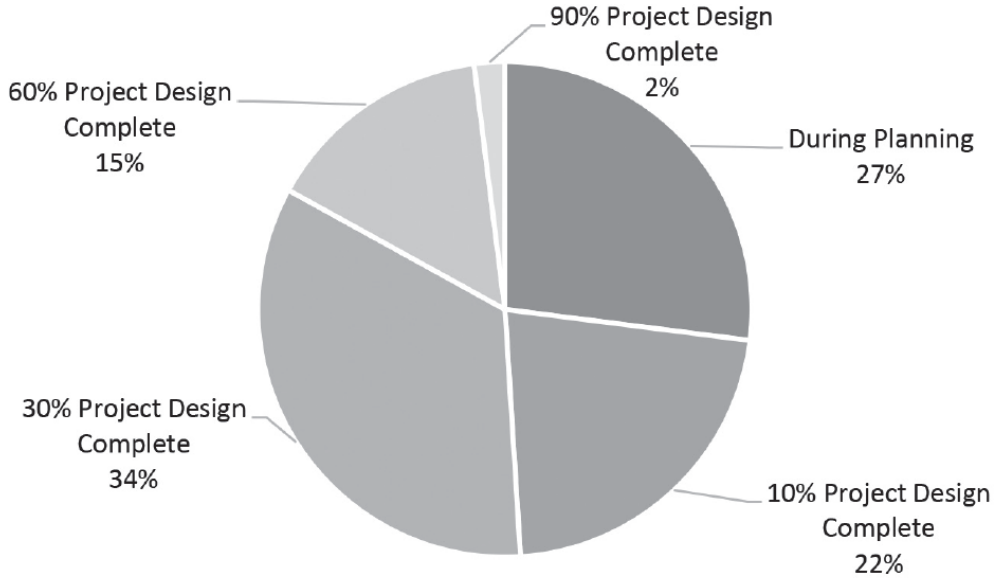


FIGURE 2 STA survey responses for timing of utility involvement.

Research—Findings

- NCHRP Synthesis 506

A similar message since 1980's…

TABLE 1
STA EFFECTIVE UTILITY COORDINATION PRACTICES

Element	Percent of STA Respondents Selected ($n = 42$)	Number of Non-STA Respondents Selected ($n = 29$)	Number of Utility Owners Selected ($n = 16$)
Early Utility Involvement in Design (30% or earlier)	88% ✦	26 ✦	15 ✦
Utility Preconstruction Meetings	67% ☆	20 ✦	12 ✦
Defined Procedures (i.e., Utility Coordination Guidance Manual)	67% ✦	17 ✦	8 ☆
Consideration of Utilities Relocation Schedules in Relation to Project Schedules	74% ✦	15 ☆	10 ✦
Use of SUE (Subsurface Utility Engineering)	57% ☆	13 ☆	2
Regularly Scheduled Meetings with Utility Owners	57% ☆	12 ☆	5
Communication of Short-Range Transportation Plan	21%	12 ☆	9 ☆
Use of Utility Corridors	14%	12 ☆	8 ☆
Use of Standardized Utility Agreements	60% ☆	8	6
Identification of and Plan for Long-Lead Items	50% ☆	4	0
Utility Mapping System (utility location information entered into a GIS-based system)	26%	10	7 ☆
Communication of Long-Range Transportation Plan	24%	10	7 ☆

✦ Top three elements selected by respondents.
☆ Top eight elements selected by respondents.
Respondents were limited to choosing their top eight.

Research—Trends

- AASHTO CRUO—Survey
  - 50 Completed Responses
    - 35 State DOTs (all regions represented)
    - 9 Design or Utility Consultants
    - 1 University
    - 5 Other

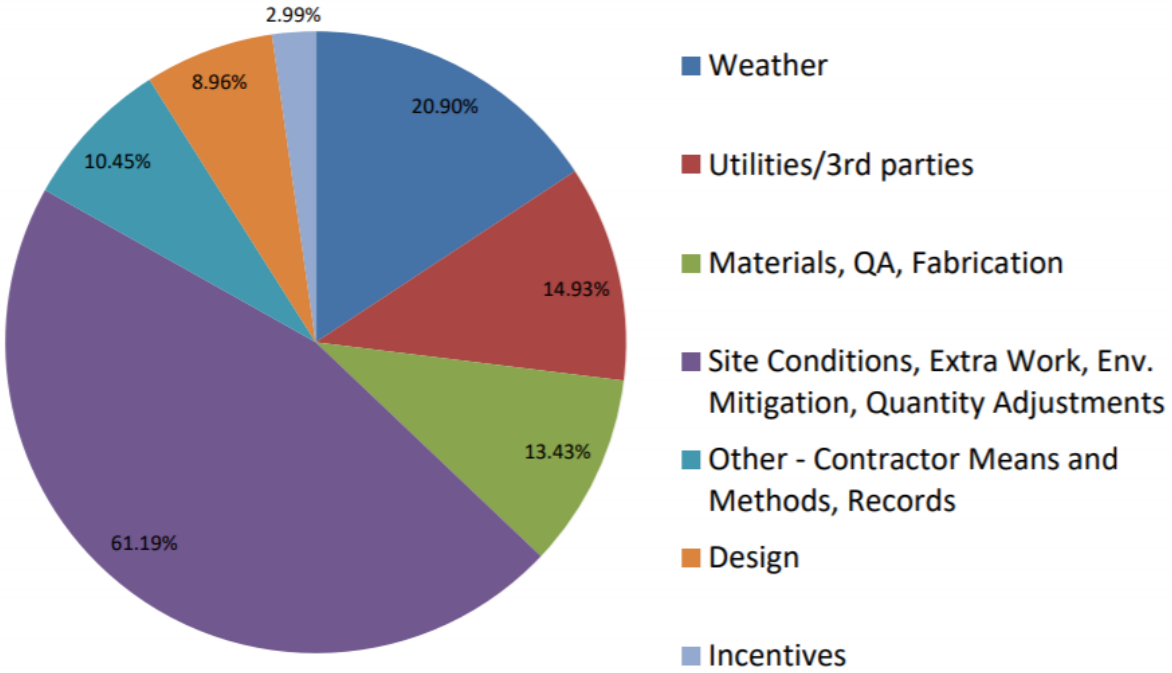
Topics	State Department of Transportation	Design or Utility Consultant	University	Other	Aggregated
Strategies to Eliminate Delays and Higher Costs to Transportation Projects Caused by Conflicts with Utilities	1	1	1	1	1
Strategies to Improve the Participation of Utility Owners During Project Delivery	2	6	7	1	4
Technologies to Improve the Detection and Documentation of Existing Utility Infrastructure	2	3	1	4	2
Quantification and Management of Utility-Related Risks During Project Delivery	4	3	3	1	3
Early Data Management Strategies to Enhance Damage Prevention Practices	5	3	7	7	5
Small Cell Tower and Other Communication Technologies	5	9	12	5	7
Curriculum Development and Training for Transportation and Utility Stakeholders	7	7	7	10	8
Technologies and Processes to Improve Utility Data Management Practices Through the Entire Life Cycle of Transportation and Utility Features	8	1	3	10	6
Strategies to Ensure an Effective Dissemination of Research Results to Users	9	9	3	8	9
Strategies to Generate Revenue and Optimize the Societal Value of The Right of Way	10	12	7	9	11
Strategies to Manage Out-of-Service Utility Infrastructure	10	11	11	5	10
Assessment, Risk Management, and Rehabilitation of Aging Utility Facilities within the Right of Way	12	8	3	10	11

Reasons

- KYTC Utility Issues
  - 9th Most Frequent Used Change Order Reason Code (Out of a study of 30 codes)
  - Average Percent Change +3.16%
  - Average Amount $35,400 per change order
- Some studies report $1 of utility coordination can save $4 to $10+ in construction

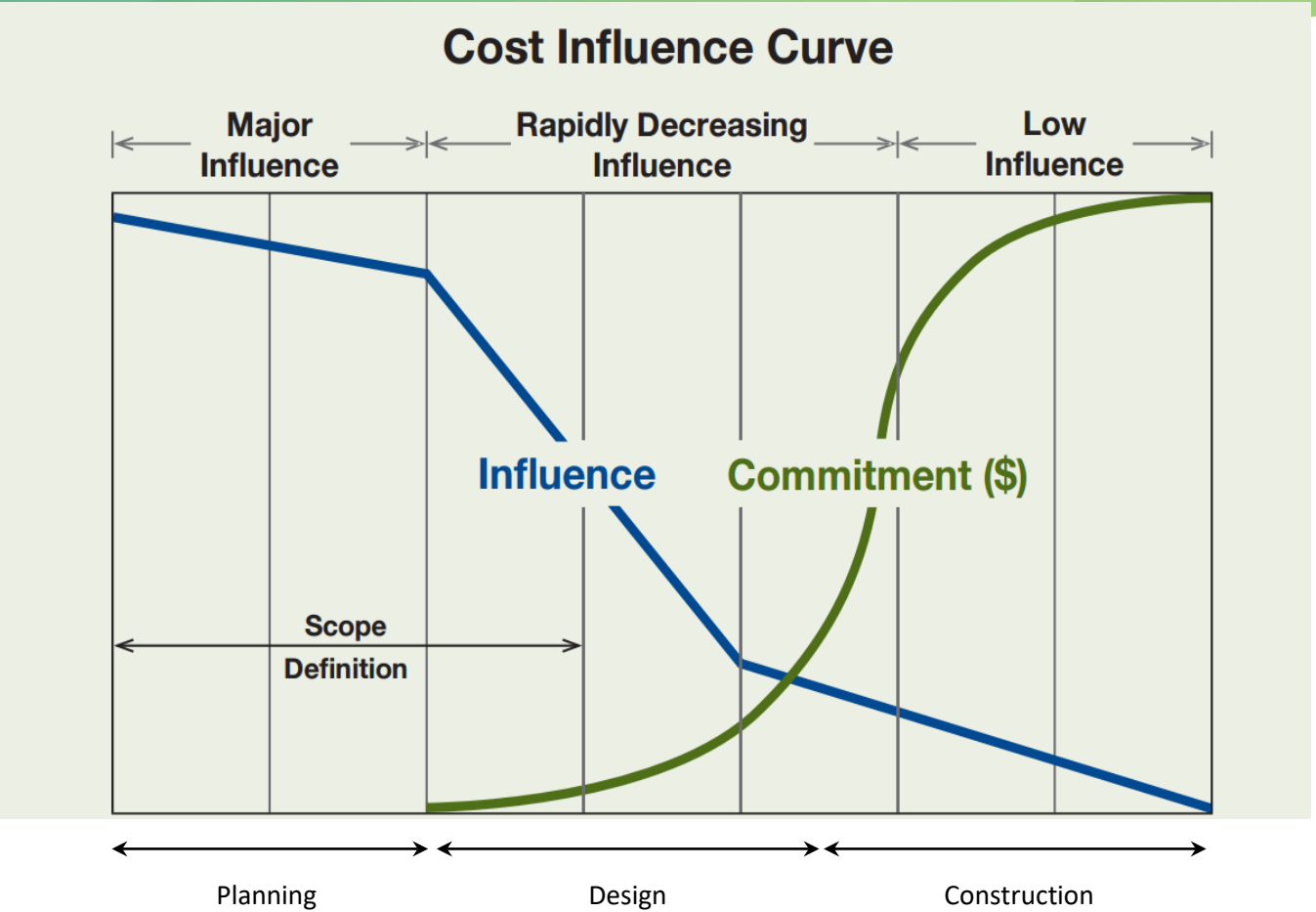
Reasons

3rd Leading Cause of Project Delays



Source: 2018 AASHTO CRUO Annual Meeting FHWA Presentation, Julie Johnston

Reasons



Early Utility Coordination

- HOW?
- Project Development
  - Phase 1 Design ~ Preliminary
    - Utility Engineering
  - Phase 2 Design ~ Final
    - Utility Coordination/Relocation

KYTC PROJECT DEVELOPMENT PROCESS

PLANNING

The scope of the potential project is defined.

PRELIMINARY ENGINEERING (PE) & ENVIRONMENTAL EVALUATION

All environmental studies are performed and a minimal amount of engineering is completed. The end result is an environmental document and preferred roadway alternative.

DESIGN

Once an environmental document is approved, the project moves into final design, which takes the final approved alternative from the previous phase and designs the project. The end result is a set of construction plans and cost estimates. Right of way needs are authorized during the design phase and utility relocation impacts also are addressed.

RIGHT OF WAY & UTILITY COORDINATION

During this phase, right of way needs are negotiated and utility relocation impacts also are addressed.

CONSTRUCTION

The project is put out for bid, a contractor is selected and the project is built.

Early Utility Coordination

- What does it look like for KYTC?
- Phase 1 Design
  - Key Steps
  - Plan for Phase 2

Early Utility Coordination

- Phase 1 Design—Purpose & Need
  - Maybe not this early…

Early Utility Coordination

- Phase 1 Design—Preliminary Survey
  - Identify above ground features
    - Complex features, joint-use poles, transmission, etc.
  - Begin utility records/contact research

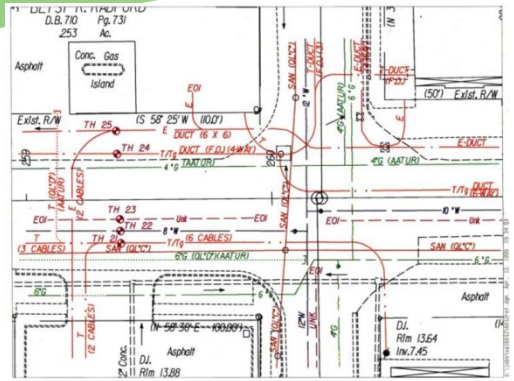
Early Utility Coordination

- Phase 1 Design—Preliminary Survey
  - Initial contact to utilities?
  - One-Call Design Ticket?
  - Use of SUE QLD or QLC
  - **Develop initial utilities inventory**

Early Utility Coordination

SUE QL D

- Review of existing utility records, permits, and plans for an approximate horizontal location.



SUE QL C

- Survey visible above ground facilities to facilitate better approximation of horizontal locations.

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Early Utility Coordination

- Phase 1 Design—Range/Selection of Alternatives
  - Refine previous information
  - One-Call Design Ticket
  - SUE QLB or QLA?
  - Preliminary Joint Utilities Meeting?
  - Identify & evaluate utility conflicts

Early Utility Coordination

SUE QL B

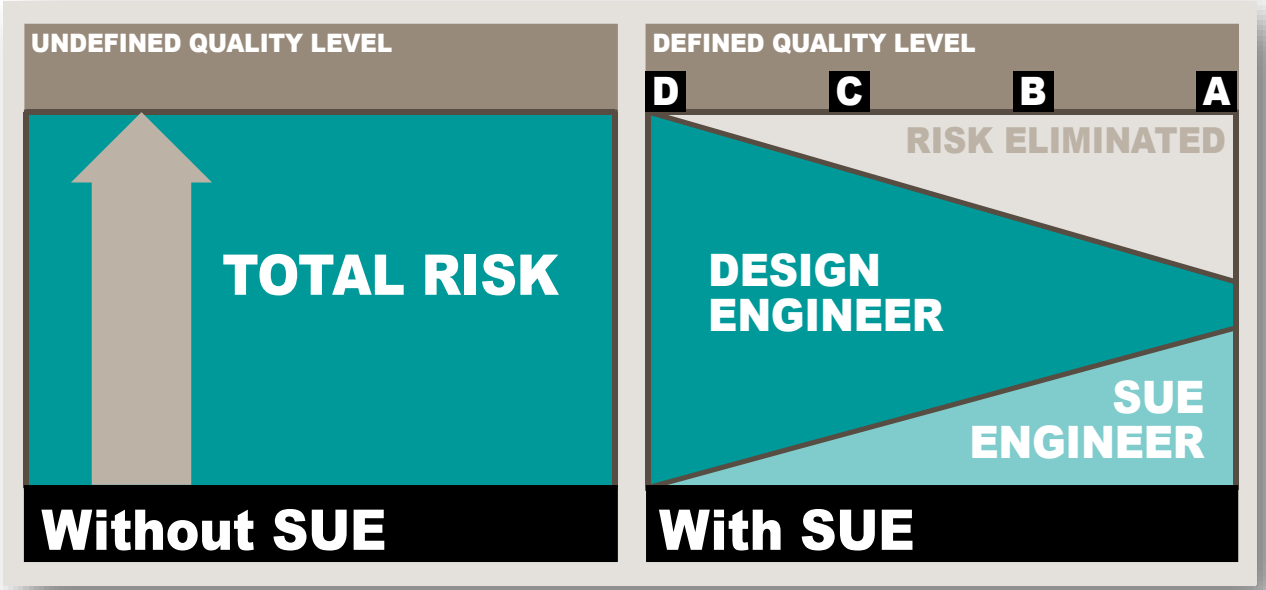
- Use geophysical prospecting tools to determine the existence and horizontal position of underground utilities.
  - THIS IS NOT ONE-CALL
  - Multiple means (GPR, inductive, conductive, and other methods) to determine HORIZONTAL locations

SUE QL A

- Use non-destructive digging equipment at critical points to determine precise horizontal AND vertical position (also type, size, and other characteristics).

Early Utility Coordination

- Strategic Use of SUE



Early Utility Coordination

- **Utility Conflict Analysis**
  - Identify utility conflicts
  - Estimate cost & time to potential resolutions
  - Proposed relocations
  - ROW & environmental impacts
  - Phase 2 or construction implications

Early Utility Coordination

- Phase 1 Design—Preliminary Line & Grade
  - Refine previous information
  - SUE QLB or QLA
  - Preliminary Joint Utilities Meeting
  - **Avoid—Minimize—Accommodate**
  - **Utility Conflict Matrix**

Early Utility Coordination

Utility Conflict Matrix

- Identified conflicts
- Responsible parties
- Current status
- Estimated clearance dates

SHRP 2 R15(B) "Identification of Utility Conflicts and Solutions"

Utility Conflict Matrix

Project Owner: Sample DOT
Project No. : 445-56-4789
Project Description: Widening of IH-10 from Loop 410 to Loop 1604
Highway or Route: IH-10

Note: refer to subsheet for utility conflict cost analysis.

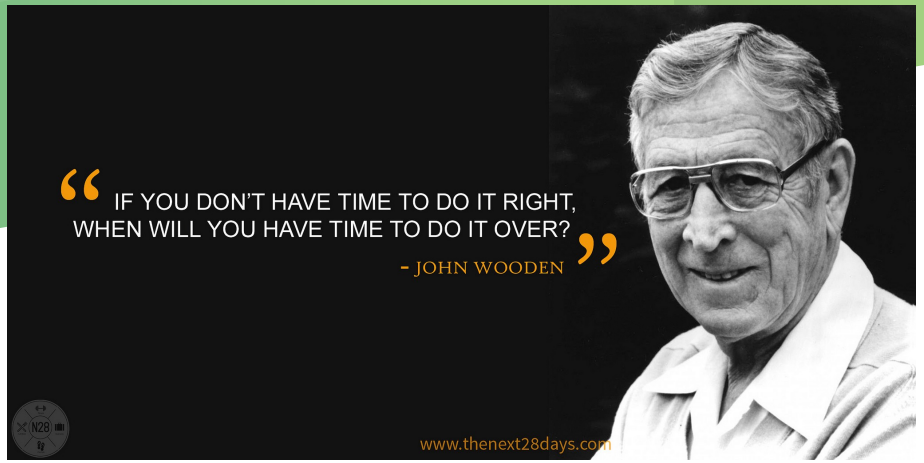
Utility Conflict Matrix Developed/Revised By: Tom Designer
Date: 3/28/2011
Reviewed By: Tom Designer
Date: 4/28/2011

Utility Owner and/or Contact Name	Conflict ID	Drawing or Sheet No.	Utility Type	Size and/or Material	Utility Conflict Description	Start Station	End Station	Start Offset	End Offset	Utility Investigation Level Needed	Test Hole	Recommended Action or Resolution	Estimated Resolution Date	Resolution Status
AWS	C16	1	Water	30" ductile iron pipe	Proposed 18" drainage pipe would cross water main.	36+50				QLA	17	Review possibility of adjusting drainage pipe to avoid conflict.		Utility conflict created
CPS	C32	1	Electric	45' pole	Existing pole in proposed roadway.	34+55				QLC		Pole to relocated.		Utility conflict created
AWS	C43	1	Water	12" water pipe	Proposed sidewalk in conflict with 12" water main.	37+00				QLA	21	Highway/sidewalk re-design to avoid utility impact.		Utility conflict created
CPS	C54	1	Electric	45' pole	Existing pole in proposed curb line.	38+30				QLC		Pole to relocated.		Utility conflict created
CPS	C55	1	Electric	45' pole	Existing pole in area of grade cut.	38+50				QLC		Pole may need to be supported or replaced with taller pole.		Utility conflict created
CPS	C61	1	Electric	45' pole	Existing pole in proposed curb line.	40+00				QLC		Pole to relocated.		Utility conflict created
ATT	C28	1	Communications	45' pole	Existing pole in conflict with proposed drainage.	40+15				QLC		Pole to relocated.		Utility conflict created

Early Utility Coordination

- Phase 1 Design—Preliminary Line & Grade
  - D phase funds for preliminary utility engineering
  - Consider utility ROW needs
  - Consultant/KYTC utility design
  - Preferred relocation alignments

Early Utility Coordination



- Noted Reasons of Why Not
  - Funding not available
  - Resources not available
  - Requires multiple agreements
  - Utility companies won’t engage

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Early Utility Coordination

- **Things to Consider**
  - Phase 2 needs…clearing, relocation by contractor, etc.
  - Identify long-lead materials
  - Prioritized utility relocations & ROW parcels
  - Replacement easements & reimbursement (used carefully)

Early Utility Coordination

- **Things to Consider**
  - Master agreements
  - Put the time into the relationships
  - Transparent information exchange
  - Continue to invite & let them decide
  - See their point of view

Coming soon…

- SPR 20-581: Integration of Utility Coordination & Highway Design
  - Alignment of Utility Engineering & Coordination Phases with Project Development Phases
  - Roles & Responsibilities

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