

Renewal Project R15: DOT-Utility Coordination: Understanding Key Aspects of the Problem and Opportunities for Improvement

This document summarizes the findings reported by the research team for Project R15 and offers strategies to resolve issues that Departments of Transportation (DOTs) and utility companies face when working together. The final report includes a plan to test and evaluate strategies designed to eliminate or mitigate utility asset relocation delays and overcome institutional barriers for the implementation of these strategies. The Responsible Staff Officer for this project is Monica A. Starnes who can be contacted at: mstarnes@nas.edu.

Utilities are frequently located on a highway right-of-way. This requires state DOTs and utility companies (UCs) to coordinate anytime renewal work on highways and bridges are planned. Current procedures for interaction between the organizations often thwart needed efficiencies. A 2001 survey of DOTs and transportation contractors ranked utility relocation as the number one cause of transportation construction delay.

In Project R15, a survey was conducted of all published information, to prepare for structured telephone interviews with DOT and UC relocation engineers and coordinators. The table on the following page displays the top three delay issues affecting design and construction.

The researchers identified four primary areas in which they focused their research:

1. Strategies to increase cooperation between UCs and DOT agencies;
2. Institutional barriers that impede implementation of strategies;
3. Evaluation methods for the strategies; and
4. Framework for effective project management in the project development process.

Creation of Strategies

The reasons for project delays were examined to identify their underlying causes. Strategies were then created to solve the delay problems by addressing the underlying causes. The strategies include:

Advanced Relocation of Utility Work

Conflicting utilities may be identified and located by UCs or contractors before the construction begins. Advanced notice by the DOT provides the UCs ample time to allocate funding for identification and possible reloca-

Primary Reasons for Project Delays Cited by UCs and DOTs

Phase	UCs		DOTs	
	Frequency Ranking	Issue	Frequency Ranking	Issue
Design	1	Limited financial and personnel resources	1	Short time frame for states to plan and design project
	2	Utility relocation not an integral part of design	2	Project design changes required changes to utility relocation
	3	Coordination with other utility agencies in the same proximity or government entities	3	Delays in obtaining rights of way for utility
Construction	1	Limited financial and personnel resources	1	Increased workload on utility relocation crews due to increase in highway and bridge construction
	2	Coordination with contractor to establish project plan to avoid relocating more than once for the same project	2	Utility lacked financial and personnel resources to execute relocation
	3	Coordination with other utility agencies in the same proximity and government entities	3	Inadequate coordination or sequencing among utilities using common poles and ducts

tion. Several state DOTs have reported success with this early action strategy. Yet, there can be numerous barriers. It is not always acceptable to create work zone delays twice: once for utilities and once for construction. In some instances, advanced utility work, can be very expensive. Also, legislative action may be required in some states to use advanced relocation.

Involve Utilities Early in the Planning and Design Phases

Involving the UCs early in the planning and design project phases has been proven to work well. Most DOTs notify UCs at the 30% design phase. This early contact can allow the designer to avoid some utility relocation and also allows the UCs to plan ahead, reducing construction delays. The existing barriers that impede routine implementation include: a lengthy right-of-way (ROW) acquisition process, UCs reluctance to proceed without assurance that the DOT will really build the project, and DOTs may wait to involve a utility company until the highway plans are finalized since plans often change.

Hold Preconstruction and Progress Meetings

Scheduling preconstruction and progress meetings throughout the construction phase can allow utility

issues to be identified and solved quickly. The meetings improve communication between the UCs and contractors, but UCs indicate that they may not have the time to attend the meetings. The DOTs, UCs, and construction contractors would all benefit from working as a team to schedule meetings that all parties can attend and ensuring that meetings are effective and productive

Provide Incentive for Early Relocation

Some DOTs will reimburse a UC for the relocation of a utility. In Tennessee, for example, utility reimbursement occurs at the discretion of the DOT commissioner. However, new legislation would be required for this to occur in most states because additional funding is required to implement the practice. Nevertheless, even with the incentive, some UCs may not be able to perform the work before construction begins.

Include Utility Relocation Work in the DOT Construction Contract

If the utility relocation work were included in the contractor's work, many of the scheduling problems between the UC and the DOT contractor would be avoided. This approach can allow the DOT contrac-

tor to be more efficient, but assumes the UC is willing to allow the contractor to perform the work. In some cases the construction contractor might not have experience working with the type of utility involved in the relocation. For this strategy to be plausible, the construction contractor would need to be trained to address the issues related to that specific utility. This strategy may also require state legislation, since the DOT would have increased liability in this construction scenario.

The above strategies and others were ranked, using input from DOTs and utility industries. In the implementation of any of the strategies, DOTs can document and assess whether or not the practice reduced design and construction schedules and saved time. The assessment can also analyze if the practices improve communication between the DOTs, UCs, and construction contractors. Even with the implementation of new strategies, many DOTs emphasize that it will not be easy to mitigate all of the existing problems. In particular, scheduling conflicts and competing priorities are a constant challenge to some of the suggested best practices. All of the parties involved need to be committed, follow the process, and perform each task. UCs and DOTs state that “If any of the parties involved fails to do its part, the process can falter or fail.”

Recommended Future Research for SHRP 2 Renewal

Based on the evaluation of the suggested strategies, the project team developed and recommended research project statements for SHRP 2. The following are synopses of the research project statements.

Information Management Systems to Support Utility Relocation and ROW Management

DOT ROW managers and designers have to work with a large volume of complex utility location data, the majority of which is not in a digital format. Using the best available information management technology could help manage the data. This project would investigate the feasibility of putting this technology into use, develop the criteria for functionality, and create a plan for product development.

Model Curriculum in Utility Relocation Engineering

for Transportation Designers

DOT designers and construction engineers have little or no formal training in the technical aspects of complex utility systems. This project would create a model training curriculum to satisfy core competencies that a DOT design specialist requires to effectively address utility relocation issues in the transportation design process.

UCs and DOTs

state that “If any of the parties involved fails to do its part, the process can falter or fail.”

Onsite Utility Construction Coordination

One Call statutes require that utilities be marked on the ground before construction begins, but in routine practice not all utilities are marked and the markings do not always

match the locations shown in the plans. It is usually the responsibility of the construction contractor to address these discrepancies. A model that could be more effective would be to assign an onsite utility construction coordinator, who would represent the DOT. This project would focus on determining cost and time effectiveness of an onsite utility construction coordinator, any barriers to implementation, the necessary training and certification of the coordinator, and the available training delivery methods.

Utility Conflict Identification and Solutions

Determining the exact three-dimensional location of a utility is a prudent but inexact activity. Regardless of how a utility’s location is determined, conflicts during design exist in most projects. Some states have general criteria for how to identify potential conflicts. This project would identify the existing formats used in state DOT utility conflict matrices, develop guidance tools, and develop complete utility matrix formats that incorporate the guidance tools.

Subsurface Utility Engineering (SUE) Qualifications

The Construction Institute of the American Society of Civil Engineers’ (CI/ASCE) national engineering standard 38-02, the “Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data,” is increasing the use of subsurface utility engineering. Some states do not have qualification standards for SUE engineers, and many that do are considering the need to upgrade them. This project would investigate DOT qualification programs and requirements for SUE consultants to develop requirements that demonstrate the competence of SUE firms and their ability to comply with CI/ASCE 38-02.

PROJECT BRIEF

Model Certification Programs for Utility Relocation Coordinators

A utility relocation coordinator may be employed by DOTs, contractors, and utilities, although there is no standard for the utility relocation coordinator's qualifications. This project would develop core competencies that utility relocation coordinators need to address utility relocation issues in transportation projects, and develop corresponding model training and experience qualification criteria. The project would also investigate the feasibility of a national certification process for utility relocation coordinators.

Follow-on Project R15-B

To continue research that can lead to the resolution of utility conflicts, SHRP 2 created project R15-B: Identification of Utility Conflicts and Solutions, which is currently active. The objective of the project is to create tools and methodology that public agencies and utilities can use to identify and resolve utility conflicts, and thus improve the project development process.

The R15 research was conducted and a report was prepared by the research team consisting of Marie Venner of ICF International, Fairfax, Virginia, and Ralph Ellis and Kathleen Vandenberg of The University of Florida, Gainesville, Florida, with support from Ginger Adams of Advantage Facilitation, Ft. Collins, Colorado, and Jim Anspach of So-Deep, Manassas Park, Virginia.

The Technical Coordinating Committee for Renewal Research in SHRP 2 oversaw the conduct of the research that is the basis for this Project Brief. The committee membership includes **Randell H. Iwasaki**, California Department of Transportation; **Daniel D'Angelo**, Office of Design, New York State Department of Transportation; **Thomas E. Baker**, Washington State Department of Transportation; **Thomas Callow**, City of Phoenix; **Steven D. DeWitt**, North Carolina Turnpike Authority; **Alan D. Fisher**, Cianbro Corporation; **Michael Hemmingsen**, Davison Transportation Service Center, Michigan Department of Transportation; **Dennis M. LaBelle**, M and T Consultants, Inc.; **William N. Nickas**, Corven Engineering, Inc.; **Mary Lou Ralls**, Ralls Newman, LLC; **John J. Robinson, Jr.**, Pennsylvania Department of Transportation; **Michael Ryan**, Michael Baker Jr., Inc.; **Cliff J. Schexnayder**, Arizona State University;

Ronald A. Sines, QC/QA Operations, P J Keating Company; **Thomas R. Warne**, Tom Warne and Associates, LLC; **James T. McDonnell**, AASHTO; **Cheryl Richter**, Pavement R&D, Federal Highway Administration; **Steve Gaj**, FHWA; **Lance Vigfusson**, Manitoba Infrastructure and Transportation; **Frederick D. Hejl** and **Amir N. Hanna**, TRB Liasons.

SHRP 2 Staff for Renewal: A. Robert Raab, Senior Program Officer; James W. Bryant, Jr., Senior Program Officer; Monica A. Starnes, Senior Program Officer; Noreen Stevenson, Senior Project Assistant.

SHRP 2

*Accelerating solutions for
highway safety, renewal, reliability, and capacity*

<http://www.TRB.org/SHRP2/>

THE NATIONAL ACADEMIES

Advisers to the Nation on Science, Engineering, and Medicine

The nation turns to the National Academies—National Academy of Sciences, National Academy of Engineering, Institute of Medicine, and National Research Council—for independent, objective advice on issues that affect people's lives worldwide.

www.national-academies.org