



Project Summary

Texas Department of Transportation

0-5475: Collection, Integration and Analysis of Utility Data in the Transportation Project Development Process

Background

Early identification of utility interests that may interfere with proposed highway facilities is a critical process for the timely development of highway construction projects. Utility conflicts occur when a utility facility is in conflict with a proposed highway facility or other utility installations, or is in noncompliance with the Utility Accommodation Rules. To resolve such conflicts, the highway agency must use strategies such as:

- introducing a design change to the horizontal or vertical alignment of the proposed highway facility,
- removing, relocating, or otherwise adjusting the utilities in conflict,
- implementing an appropriate engineering countermeasure other than a roadway design change or utility adjustment, or
- accepting an exception to policy.

Delays in utility relocation have a tendency to proliferate into project letting and even construction, which may result in increased costs and/or claims from contractors. Effective management of utility conflicts is an important factor to keep projects on schedule.

What the Researchers Did

The focus of the research project was utility data exchange in the project development process and the development of a prototype utility conflict data management system. The researchers met with utility coordination stakeholders, including Texas Department of Transportation (TxDOT) officials at both division and district levels, utility companies, and utility consultants; and performed an analysis of utility conflict data flows between utility accommodation stakeholders in the TxDOT project development process. The researchers developed updated graphical representations of the utility coordination business process at TxDOT, developed data models to accommodate work and data flows between such stakeholders, and developed a web-based prototype for the management of utility conflict data called Utility Accommodation and Conflict Tracker (UACT).

What They Found

Utility coordination issues that are central to TxDOT's ability to manage utility conflicts and utility coordination data effectively include the following:

- enormous amount of data produced by a large number of stakeholders,
- complexity of utility agreements,
- difficulty of involving utilities in coordination meetings early in the process,
- uncertainty of utility facility locations,
- identification of utility facility ownership,
- efficient access to subsurface utility engineering data,
- inadequacy and incompleteness of utility design drawings and as-builts, and
- delayed submission of bills by reimbursable utilities.

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These and other utility coordination issues helped the researchers identify critical needs that UACT would have to address, such as improving communication among stakeholders, tracking utility conflicts, exchanging utility conflict and related data, tracking critical events during the process, and providing a mechanism to create management reports.

The updated business process model integrates a number of existing process diagrams, identifies responsibilities, and describes the flow of critical process documents. The model provided a foundation for the development of logical and physical data models that explicitly considered documents, features, projects, and users. The UACT prototype tested the functionality of these data models.

What This Means

A full implementation of UACT would provide the following benefits to TxDOT:

- more effective utility coordination and improved relations with utilities,
- reduced time and cost to produce and process utility agreements,
- visualization and tracking of utility conflicts,
- Internet access to project data through integration with existing TxDOT systems,
- elimination of redundant data entry and quality control of Design and Construction Information System (DCIS) project data in UACT and the Right of Way Information System (ROWIS),
- reporting tools to monitor project status and performance,
- tracking of key notifications to utilities compliant with state law,
- standardization of utility certifications for plans, specifications, and estimates (PS&E) documentation, and
- high potential for significant cost savings, resource savings, and reduced utility delay during construction.

The researchers recommend an implementation of UACT at two or three testing districts to determine requirements for statewide implementation and offer the following recommendations:

- Upgrade district utility coordination systems and the ROW Division Utility Agreement Database with UACT.
- Incorporate the construction specification and unit cost framework for utility installations from research project 0-4998 into UACT.
- Integrate the utility facility database into UACT.
- Update ROWIS to improve utility coordination efficiency.
- Harmonize task descriptions and references in TxDOT manuals.
- Evaluate the feasibility of providing design drawings to utilities in the early stages of the project.
- Develop/update curricula for process stakeholders using the utility coordination business process model.
- Publish an easy-to-use guideline about the utility coordination process for use by process stakeholders to complement information in the TxDOT *Utility Manual*.

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