Project Summary

Texas Department of Transportation

0-5788: ROW Real Property Asset Management Architecture

Background

The Texas Department of Transportation (TxDOT) is responsible for managing 1.1 million acres of land that provide right of way for approximately 80,000 centerline miles of state-maintained roads. Management of the huge right of way asset involves considerable resources and the coordination of numerous business processes. There is an urgent need to develop a right of way asset data architecture to facilitate the inventory and management of TxDOT right of way assets. This architecture would facilitate the identification of current right of way boundaries, tracking of right of way boundary changes, automatic mapping of right of way surveying data to other layers of information such as control section job and route number locations, and complete attribution of right of way assets. It would also simplify the production of reports, including those needed to address financial reporting requirements.

What the Researchers Did

The researchers evaluated current right of way data practices at TxDOT and other agencies, developed and tested a prototype geographic information system (GIS)-based right of way asset data model, and prepared implementation recommendations.

What They Found

TxDOT uses a variety of information systems to support right of way processes, including the Design and Construction Information System (DCIS), the Right of Way Information System (ROWIS), Right of Way Map Locator, and Survey Primary Control Markers. In particular, ROWIS enables users to capture, track, and report data related to the right of way acquisition process. However, ROWIS provides little support for the management and inventory of right of way assets after the conclusion of the acquisition process. In addition, ROWIS does not have the functionality to display (or to provide a link to) right of way parcels on a map. Further, ROWIS handles encumbrances, e.g., easements, as an acquisition interest code, which prevents users from easily visualizing the location and spatial extent of those encumbrances.

Research Performed by:

Texas Transportation Institute (TTI),
The Texas A&M University System

Texas A&M University - Corpus Chrisiti, (TAMUCC)

Research Supervisor:
Cesar Quiroga, TTI

Researchers:
Nicholas Koncz, TTI
Edgar Kraus, TTI
Yingfeng Li, TTI
Stacey Lyle, TAMUCC

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The review of practices at other agencies included examples of parcel data modeling efforts at the national level, as well as right of way asset management practices and plans at 11 state departments of transportation. Although several states still use paper-based procedures or rely on mainframe legacy systems, in most cases states are in the process of modernizing or updating their right of way information systems. Some states rely on desktop databases and other applications for specific right of way related processes. Some states are also incorporating GIS-based mapping components into their right of way management systems. The use of document management systems to support right of way functions is also increasing.

For the development of the prototype right of way asset data model, the researchers took into consideration parcels, property rights, and encumbrances separately, while enabling linkages through procedures such as regular many-to-many relationships and spatial overlays. The model also took into consideration four types of data needed for managing right of way assets, data about features on the ground (normally on the state right of way), data about right of way asset documents, data about projects, and data about users who may need to interact with features, documents, or projects.

The researchers used three different environments to test the right of way asset data model: standalone database, standalone GIS application, and web based. The standalone database and GIS testing environments focused on basic database design and relationship testing using a variety of "ready-made" tools that expedited the testing process. The web-based testing environment focused on the examination of implementation and integration issues with other systems and on the demonstration of the model performance using an online interface (which proved useful during discussions with TxDOT officials when issues such as model implementation, portability, and functionality were raised).

What This Means

Recommendations for implementation include the following:

- implement a strategy for a permanent repository of electronic files that supports right of way asset management plans effectively,
- implement strategies to populate a right of way asset GIS database,
- modify the Right of Way document class in FileNet®,
- add standardized certification and disclaimer text labels to geospatial documents,
- modify Form ROW-MapCheck to address electronic file delivery requirements,
- require the submission of right of way feature data in GIS format, and
- update ROWIS to support modernization initiatives at the Right of Way Division.

For More Information:
0-5788-1 Right of Way Real Property Asset Management – Prototype Data Architecture

Research Engineer - Duncan Stewart, TxDOT, 512-465-7403
Project Director - Darryl Zercher, TxDOT, 512-467-3782
Research Supervisor - Cesar Quiroga, TTI, 210-731-9938

www.txdot.gov
keyword: research

Texas Department of Transportation
Research and Technology Implementation Office
P.O. Box 5080
Austin, Texas 78763-5080
512-465-7403