Research Initiatives at TxDOT Related to Utilities and Right of Way

Transportation Research Board
Workshop on Transportation Law, New Orleans, LA

July 17, 2012
Overview

• TxDOT utility/right of way research projects
  ◦ Recently completed (3)
  ◦ Completing this FY (2)
  ◦ Starting this FY (1)
Projects Recently Completed

- Integrating Utility Conflict Elimination and Environmental Process (0-6065, 2010)
- Feasibility and Applications of RFID Technologies to Support Right of Way Functions (0-6142, 2010)
- Evaluation of Overweight Load Routing on Buried Utility Plant (0-6394, 2011)
Integrating Utility Conflict Elimination and Environmental Process (0-6065)

- Better utility data during preliminary design?
- Increasing the level of definition of design components during preliminary design?
Integrating Utility Conflict Elimination - Results

• Conclusion: Yes/Yes!

• 10 optimization strategies
  ◦ Involve environmental and right-of-way staff in planning and programming
  ◦ Include some design elements during preliminary design
  ◦ Address utility issues in constructability review during preliminary design
Integrating Utility Conflict Elimination - Products
RFID Technologies to Support Right of Way Functions (0-6142)

- Feasible to use RFID technologies to manage utilities (and other assets) in the ROW?
- Identified potential applications of RFID technology
- Laboratory evaluation of RFID tags in a range of buried applications
- High-level RFID software integration schema for RFID application to asset management
- Cost-benefit analysis of RFID technologies
RFID Technologies to Support Right of Way Functions (0-6142)
RFID Technologies to Support ROW - Results

• Conclusion: Depends
• Retroactive implementation of RFID would be challenging
• Extensive use necessary before benefits can be realized
• Concern over RFID functionality of life of buried utilities (20-50 years)
• Benefit for RFID during utility relocation
Evaluation of Overweight Load Routing on Buried Utility Plant (0-6394)

• Assessment of
  ◦ potential impact of overweight loads on buried utilities
  ◦ adequacy of Utility Accommodation Rules to deal with overweight loads on buried utilities

• Recommendations for
  ◦ business process for TxDOT overweight routing coordination
  ◦ changes to TxDOT manuals
  ◦ changes to the UAR
Evaluation of Overweight Load Routing - Activities

- Review of technical design and engineering requirements, UAR, TxDOT business process for overweight load permitting
- Stakeholder outreach
- Impact analysis
  - Sensitivity analysis, finite element analysis
- Lab testing
  - Jointed and unjointed PVC pipe
  - Jointed concrete pipe
Evaluation of Overweight Load Routing on Buried Utility Plant (0-6394)
Evaluation of Overweight Load Routing - Results

• Current UAR standards for water and sanitary sewer appear adequate
• Recommendation for depth of cover to improve consistency and clarity
• Sharing of vulnerable utility facility locations with TxDOT permit routing system
Projects Completing This Year

• Improving the Response and Participation by Utility Owners in the Project Development Process (0-6624)
• Best Practices for Utility Investigations in the TxDOT Project Development Process (0-6631)
Improving Participation by Utility Owners in Project Development (0-6624)

- Strategies to encourage earlier, effective participation by utility owners
- Recommendations for changes to business processes and manuals
- Potential changes in laws and regulations
- Implementation plan and guidebook
- Draft materials for regional workshops
Improving Participation by Utility Owners

Project Focus

- Modernization of the utility process
- Use of utility conflict matrices (UCMs) and associated procedures
- Streamlining and standardization of utility cost data submissions
- Implementation plan and requirements for core skill training
## Unit Cost Analysis Sheet

### Get Items

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item Name</th>
<th>Unit</th>
<th>Quantity</th>
<th>Unit Cost ($/unit)</th>
<th>Amount ($)</th>
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</thead>
<tbody>
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<td>Acquire ROW easement</td>
<td></td>
<td></td>
<td>$</td>
<td>-</td>
</tr>
<tr>
<td>102</td>
<td>Remove traffic signs</td>
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<td></td>
<td>$</td>
<td>-</td>
</tr>
<tr>
<td>104</td>
<td>Remove concrete and asphalt pavement</td>
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<td></td>
<td>$</td>
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<tr>
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<td>Select backfill for structure</td>
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<td></td>
<td>$</td>
<td>-</td>
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<tr>
<td>402</td>
<td>Trench excavation protection</td>
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<td></td>
<td>$</td>
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<tr>
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<td>Manhole</td>
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<td>612</td>
<td>Water valve</td>
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<tr>
<td>802</td>
<td>Abandone structure</td>
<td></td>
<td></td>
<td>$</td>
<td>-</td>
</tr>
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<td><strong>Total</strong></td>
<td></td>
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</table>

### Calculate Amount

<table>
<thead>
<tr>
<th>Imported Amount ($)</th>
<th>Validated Unit Cost ($)</th>
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<tbody>
<tr>
<td>$</td>
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</table>

### Validate Unit Costs

<table>
<thead>
<tr>
<th>Imported Amount ($)</th>
<th>Validated Unit Cost ($)</th>
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<tbody>
<tr>
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<td>$</td>
</tr>
</tbody>
</table>
Best Practices for Utility Investigations in TxDOT Project Development (0-6631)

- Identify best practices for effective use of utility investigations in the project development process
Best Practices for Utility Investigations - Activities

- Review current techniques and technologies
- Review best practices in other states
- Survey TxDOT about current practices
- Examine effects of utility investigation services on project costs, efficiencies, and delivery
- Determine best practices
- Draft content for ROW Utility Manual
- Implementation plan, companion guidebook, and training materials
Best Practices for Utility Investigations - Products

• Research report (10/2012)
  ◦ Utility investigation trends in Texas (TRB paper accepted)
  ◦ Effects of utility investigation services on project delivery (TRB paper 2013)
  ◦ 20 best practices and district feedback

• 4-hour training course (08/2012)
  ◦ PowerPoint presentation
  ◦ Companion guidebook
  ◦ Implementation plan
Upcoming Projects

- Determine the Cost for TxDOT to Process, Review, and Approve Utility and Driveway Permits (0-6756)
Cost to Process, Review, and Approve Utility and Driveway Permits (0-6756)

- Time/costs for processing utility and driveway permits
- Recommend fee schedule
- Feasibility of transferring permitting functions to municipalities
- Process for access management compliance if permitting transferred to municipalities

- Start: 09/01/2012
Thank You!

• Questions, comments e-kraus@tamu.edu