UTILITY ENGINEERING IMPLEMENTATION IN TEXAS: LESSONS LEARNED

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Utility Conflict Management Implementation

- **Two Main Phases:**
  - **Phase 1:** One-day Utility Conflict Management (UCM) training course at Metro Districts
  - **Phase 2:**
    - UCM training at all Districts
    - UCM implementation at Metro District projects
### One-Day Course: Identifying and Managing Utility Conflicts

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Participants</th>
<th>TxDOT Participants</th>
<th>Non-TxDOT Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 2016</td>
<td>Total</td>
<td>224</td>
<td>136</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>45</td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td></td>
<td>61%</td>
</tr>
<tr>
<td>FY 2017</td>
<td>Total</td>
<td>836</td>
<td>505</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>35</td>
<td>21</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td></td>
<td>60%</td>
</tr>
<tr>
<td>FY 2018</td>
<td>Total</td>
<td>411</td>
<td>267</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td></td>
<td>65%</td>
</tr>
<tr>
<td>Overall</td>
<td>Total</td>
<td>1471</td>
<td>908</td>
</tr>
<tr>
<td></td>
<td>Average</td>
<td>36</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Percentage</td>
<td></td>
<td>62%</td>
</tr>
</tbody>
</table>
Utility Conflict Management Emphasis

- Avoid
- Minimize
- Accommodate
One-Day Course: Lessons Learned

- Positive comments from participants taking the class
  - Increased awareness of project delivery process
    - Emphasis on early utility coordination and identification of conflicts
  - More project managers and designers should take the class
- Many practices regarding utility data documentation and conflict management
  - Almost 20 sample projects reviewed and used for the afternoon exercise
  - Utility investigation timing, scope, quality, and completeness
  - Mapping and documentation on project files
  - Information conveyed to contractors (both highway and utility)
- UCM process is a good model moving forward
  - Standardization is critical
## UCM Implementation Monitoring – Selected Projects

<table>
<thead>
<tr>
<th>District</th>
<th>Project</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austin</td>
<td>FM 971, SH 95 to SH 130 in Travis County</td>
<td>Widening lanes, shoulders, nine bridge culverts</td>
</tr>
<tr>
<td>Dallas</td>
<td>SH 352 from Kearney St to US 80 in Dallas County</td>
<td>Widening lanes</td>
</tr>
<tr>
<td>Fort Worth</td>
<td><strong>Old</strong>: FM 156 in North Tarrant County (3.78 mi) &lt;br&gt; <strong>New</strong>: US 377 in Hood and Johnson Counties (2.50 mi)</td>
<td>Four-lane urban minor arterial, curb and gutter &lt;br&gt; Four-lane divided highway with bridge over railroad</td>
</tr>
<tr>
<td>Houston</td>
<td>SH 36 in Fort Bend County (8.06 mi)</td>
<td>Hurricane Evacuation Route - widen to 4 lane divided highway</td>
</tr>
<tr>
<td>San Antonio</td>
<td>US 281 north of Stone Oak in Bexar County (4.15 mi)</td>
<td>Six-lane expressway with frontage roads</td>
</tr>
</tbody>
</table>
SAN ANTONIO DISTRICT
PILOT PROJECT
US 281 – Segment 2
US 281 Segment 2 - 0.8 miles North of Stone Oak to County Line

- **Scope:** Two general purpose lanes and one HOV lane in each direction along with necessary transition and auxiliary lanes

- **Let Date:** July 2018 *(moved up from December 2018)*

- **Estimated Construction Start Date:** January 2019

- **ROW/Utilities:**
  - 54 parcels acquired (within a year timeframe)
  - Ongoing utility coordination with SAWS water & sewer, CPS gas, CPS overhead electric, AT&T, Spectrum, GVTC, and Level 3/CenturyLink
  - Joint bid utilities include SAWS water, SAWS sewer and CPS gas
  - Estimated Non-joint Bid Utility Clearance Date: December 2019

- **Estimated Construction Completion Date:** Fall/Winter 2022

- **Construction Cost:** $179M
US 281 Segment 2- 0.8 miles North of Stone Oak to County Line

**Project Timeline**

- **12/19/16**: SHRP2 R15B Kick Off Meeting
- **7/10/18**: Project Let Date
- **12/1/19**: Non-Joint Bid Utility Clearance Date
- **8/1/22**: Estimated Construction Completion

**Ongoing Non-Joint Bid Utility Coordination**

- **11/1/2016**: Utility Kick Off Meeting
- **2/7/17**: Estimated Construction Start Date
- **2/28/18**: Non-Joint Bid Utility Construction Start Date
- **9/1/2022**:
US 281 Segment 2 - 0.8 miles North of Stone Oak to County Line

- Environmental Challenges:
  - Pending Environmental Clearance
  - Overhead electric work was included in TxDOT Biological Opinion

- ROW Acquisition Challenges:
  - Property Owners not wanting to vacate

- Vegetation Clearing: 100% Complete
  - Close coordination with our ROW team

- Overhead electric power pole relocation:
  - Approximately 400 poles will be relocated
  - Construction started on 2/28/18
  - Estimated Completion (including existing pole removal): 12/2019
  - Telecoms attached to poles: Level 3/Centurylink, Spectrum, AT&T, and GVTC
US 281 Segment 2 - 0.8 miles North of Stone Oak to County Line
Avoid, Minimize, Accommodate (AMA) Approach

- Avoid:
  - Lowered the profile of highway (SBFR) 5 feet to avoid transmission line adjustment
  - Cost Savings: ~$3M (Utility Cost)
  - Time Savings: ~2 years of design and construction time *(would not have met letting date)*
Avoid, Minimize, Accommodate (AMA) Approach

- Avoid/Minimize:
  - Shifted frontage road about 5 feet closer to the main lanes
  - Avoided ~1 mile of transmission 24” water line from being adjusted; only manholes to be adjusted within sidewalk
  - Cost Savings: ~$1.6M (Utility Cost)
  - Time Savings: ~3 months of construction time (joint bid) and ~1 month in reduced design timeline
Avoid, Minimize, Accommodate (AMA) Approach

- Accommodate:
  - Assigned utility relocation corridors
  - Vegetation Clearing for Overhead Utilities
    - Utility Cost Savings: $1.8M
    - Allowed TxDOT control of schedule
US 281 Segment 2 - 0.8 miles North of Stone Oak to County Line
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Utility Conflict Management Benefits

- Redesigning around Utilities pays off!
  
- Utility Cost Savings within the last 2 years:
  - ~$4.6M on US281 Phase 2
  - ~$2.4M on other projects districtwide

- Time Savings (design and construction):
  - ~2.5 years on US281 Phase 2
  - ~1.5 years on other projects districtwide

- Building Relationships: Priceless!
<table>
<thead>
<tr>
<th>Challenges</th>
<th>Business Process Improvements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utility Coordination and SUE was occurring too late in the project cycle</td>
<td>Including Utility Coordination and SUE in Schematic Contracts</td>
</tr>
<tr>
<td>(30% or 60% PS&amp;E)</td>
<td>TxDOT will reimburse utility if projects are “shelved” or cancelled through Master Utility Agreement</td>
</tr>
<tr>
<td>Some Utility Owners would not begin their design until ROW was acquired</td>
<td>1) Some districts design includes underground features (drainage, walls, etc.) within the 30% PS&amp;E plans to identify conflict early</td>
</tr>
<tr>
<td>due to fear of canceling project</td>
<td>2) TxDOT will reimburse utility for major design changes through Master Utility Agreement</td>
</tr>
<tr>
<td>Utility Owners would not begin their design until all conflicts were</td>
<td>TxDOT will clear ROW in advance of construction project using ROW division contract or bidding</td>
</tr>
<tr>
<td>identified to avoid redesign</td>
<td>TxDOT designers and project managers will do their best to avoid, minimize, then accommodate utilities</td>
</tr>
<tr>
<td>Utilities relied on TxDOT contractor to clear ROW</td>
<td></td>
</tr>
<tr>
<td>Major utility relocation could take several years to be completed</td>
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</tr>
</tbody>
</table>
Utility Conflict Management Benefits – Results of Pilot

Efforts currently being tracked have indicated an estimated savings of more than $9 million, and as many as 38 months in time savings across 4 projects*

<table>
<thead>
<tr>
<th>District in Pilot / # of Utility Conflicts</th>
<th>Estimated Savings Identified ($M)</th>
<th>Identified Time Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas District (2)</td>
<td>$0.5</td>
<td>15 months</td>
</tr>
<tr>
<td>Fort Worth District (8)</td>
<td>$1.8</td>
<td>38 months</td>
</tr>
<tr>
<td>Houston District (2)</td>
<td>$2.9</td>
<td>-</td>
</tr>
<tr>
<td>San Antonio District (2)</td>
<td>$4.6</td>
<td>24 months</td>
</tr>
</tbody>
</table>

*Pilot is still in effect through FY ‘19. It is anticipated that savings will be multiplied as this process is implemented statewide.
Utility Conflict Management – Statewide Implementation

Memo from Chief Engineer
October, 2018

Develop Implementation Plan

Continue Training And Execute Implementation Plan

Continue Training And Execute Implementation Plan
Contact Information

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