MAIN STREET

I THOUGHT THIS WAS JUST A WIDENING PROJECT!

ROBERT CASKEY, P.E.

DALLAS TEXITE LUNCHEON
AUGUST 9, 2019
OUTLINE

• Overview and Background
• Design
• Construction
• Lessons Learned
PROJECT TASKS

Original Tasks
• Widen to 6 lanes
• Modify 6 existing signals
• New 30” water line

Additional Tasks
• Accommodate transmission lines
• Improve Legacy intersection
• Add a new signal
• Tree relocation
• Illumination reinstall
• Add capacity to Teel and Legacy
• Pavement maintenance
EXISTING CONDITIONS

3 miles
4 lane divided
45,000 VPD
AM Peak: Eastbound
PM Peak: Westbound

6 signals
Illumination
Failing Pavement
“BURY THE LINES”

- Brazos Electric proposed 80’ poles down the median
- Citizens wanted an alternative
- First in Texas and first for Brazos
- Incorporated transmission line plans into civil plans
- $27 million overall bid price, $5 million for transmission line
DESIGN

- Legacy Drive Intersection
- Phasing
## BENEFIT / COST ANALYSIS

<table>
<thead>
<tr>
<th>Year 2030 Alternative</th>
<th>Existing Geometry (Baseline)</th>
<th>Traditional Widening</th>
<th>SPUI</th>
<th>Michigan Lefts</th>
</tr>
</thead>
<tbody>
<tr>
<td>PM Peak Hour Delay (veh-hour)</td>
<td>357.0</td>
<td>125.8</td>
<td>122.1</td>
<td>346.4</td>
</tr>
<tr>
<td>Daily Total Delay (veh-hour)</td>
<td>3,570.0</td>
<td>1,258.0</td>
<td>1,221.0</td>
<td>3,464.0</td>
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<tr>
<td>Daily Delay Savings (veh-hour)</td>
<td>NA</td>
<td>2,312.0</td>
<td>2,349.0</td>
<td>106.0</td>
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<tr>
<td>Working Days per Year</td>
<td></td>
<td>250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Delay Savings (veh-hour)</td>
<td>NA</td>
<td>578,000.0</td>
<td>587,250.0</td>
<td>26,500.0</td>
</tr>
<tr>
<td>TxDOT Road User Cost of Delay</td>
<td></td>
<td></td>
<td>$20.35</td>
<td></td>
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<tr>
<td>Annual Benefit</td>
<td>NA</td>
<td>$11,762,300.0</td>
<td>$11,950,537.5</td>
<td>$539,275.0</td>
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<tr>
<td>Present Value of Life Service Benefit*</td>
<td>NA</td>
<td>$124,609,973.8</td>
<td>$126,604,164.5</td>
<td>$5,713,087.0</td>
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<tr>
<td>Estimated Construction Cost</td>
<td>NA</td>
<td>$5,800,000.0</td>
<td>$2,800,000.0</td>
<td>$1,700,000.0</td>
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<tr>
<td>Benefit/Cost Ratio</td>
<td>NA</td>
<td>21.5</td>
<td>45.2</td>
<td>3.4</td>
</tr>
</tbody>
</table>

*Present Value of Life Service Benefit over 20 years using a 7% Discount Rate
SPUI ADVANTAGES AND DISADVANTAGES

• **Advantages**
  - No median storage
  - Concurrent moving of opposing lefts
  - Compact design (comparatively)
  - Wider turns
  - Higher discharge rate

• **Disadvantages**
  - Atypical with thru movements from both streets
  - Peds can’t cross in one cycle
  - Longer clearance intervals
PROPOSED PHASING
CONSTRUCTION

• Brazos Duct Bank and Vaults
• Legacy Drive Intersection
• Traffic Control
• Travel Times
LEGACY AT MAIN INTERSECTION
LEFT TURN HEADS
LEGACY EARLY ISSUES

• Crashes
  • 16 total since opened in August 2018
    • 6 making a left from thru lane (4 in first month)

• Stopping in intersection
• Left Turn Stop Bars
• Ongoing construction
TRAFFIC CONTROL

• Daily Lane Closures
• Phasing
• Traffic Switch
• Legacy Drive
DAILY LANE CLOSURES

• 9:00 a.m. - 3:30 p.m.
• Occasionally start at 8:30 a.m. or go until 4:00 p.m. in non peak directions, if beneficial
• Subcontractors - sawcut, paving, joint seal, stripe, sidewalk, landscape, Brazos
• Detection Issues – Closing Lanes at Signalized Intersections
ACTUAL PHASING
PAVEMENT MAINTENANCE

• Replaced 20% of existing pavement
• $3 million total cost
WESTBOUND CLOSURE

- Maintenance and widening
- 10 week construction became 4 weeks by implementing full closure
- Maintain Commercial and Residential Access
- Temporary Signal at Kyser Lane
WESTBOUND CLOSURE AT KYSER WAY
SIGNAL AT KYSER WAY
EASTBOUND TRAVEL TIMES

January 2018-May 2019

Average Travel Time 7-9AM: Eastbound Main Street

FM 423 - Teel
Teel - Tollway
WESTBOUND TRAVEL TIMES

January 2018-May 2019

Average Travel Time 4-7PM: Westbound Main Street

DNT - Teel

Teel – FM 423
LEGACY CLOSURE TEST

- Water line and duct bank install
- Improved Operations
- Test for Legacy paving/Council Approval
PLANNED PHASING
(Legacy Drive)
ACTUAL PHASING
TRAVEL TIMES

EB – Main – 423 to DNT

Travel Time (mins)

Time of Day

May 5, 2014 – May 23, 2014 (Mo, Tu, We, Th, Fr)
May 8, 2017 – May 26, 2017 (Mo, Tu, We, Th, Fr)
May 7, 2018 – May 21, 2018 (Mo, Tu, We, Th, Fr)
May 5, 2015 – May 22, 2015 (Mo, Tu, We, Th, Fr)
May 9, 2016 – May 27, 2016 (Mo, Tu, We, Th, Fr)
May 4, 2019 – May 24, 2019 (Mo, Tu, We, Th, Fr)
AM PEAK BY YEAR

EB – Main – 423 to DNT

Travel Time (mins.)

Monday | Tuesday | Wednesday | Thursday | Friday | Saturday | Sunday

Days of Week

FRISCO

FRISCO
TRAVEL TIME VARIABILITY

EB - Main - 423 to DNT

Travel Time (mins)

Time of Day

May 5, 2014 - May 23, 2014 (Mo,Tu,We, Th) 25th and 75th Percentiles
5th and 95th Percentiles
25th and 75th Percentiles
May 8, 2017 - May 26, 2017 (Mo,Tu,We, Th) 25th and 75th Percentiles
25th and 75th Percentiles
May 9, 2016 - May 22, 2016 (Mo,Tu,We, Th) 25th and 75th Percentiles
25th and 75th Percentiles
May 4, 2015 - May 22, 2015 (Mo,Tu,We, Th) 25th and 75th Percentiles
25th and 75th Percentiles
May 6, 2019 - May 24, 2019 (Mo,Tu,We, Th) 25th and 75th Percentiles
LESSONS LEARNED

• Don’t forget your phasing, if you can
• Major closures aren’t that bad
• Keep the public informed
CONTACT INFORMATION

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