Monthly Developer/Consultant Process Training

Traffic Management Design

Session 11 Part 1: Traffic Signals, Kassem Elkhalil, PE
Session 11 Part 2: Street Lights, Marisa Conlin, PE
Session 11 Part 3: Roundabouts, Lissette Acevedo, PE, PTOE

Wednesday, January 9, 2019
TRAFFIC SIGNAL DESIGN
Objectives

- Traffic Signal Warrants
- Traffic Signal Design
TRAFFIC SIGNAL WARRANTS

• Traffic signals are warranted based on the MUTCD traffic signal warrants

• Warrants are evaluated based on engineering studies of the existing and projected traffic conditions, pedestrian and physical characteristics, and number of accidents at the intersection
DESIGN PLAN - PREPARATION

1. City Traffic Engineer will provide
   • Sample plan set
   • CAD cell library
   • Latest general notes
   • Standard specification details from Buzzsaw
   • Traffic signal guidelines

2. Field meeting with consultant to identify
   • Location of power source
   • Locations of potential/existing traffic control devices
TRAFFIC SIGNAL DESIGN PLAN

• Cover sheet
• General Notes
• Index sheet
• Quantity Summary Sheet
• Existing, Removal, Proposed Signal Layout Sheets
• Detail Standard Sheets

• Signs and pavement marking sheet(s)
• Detailed ADA Ramp Sheet(s)
• Detailed corner sheets
• Summary of conduit and cable sheet
• Signal pole location sheet
TRAFFIC SIGNAL DESIGN PLAN

• Show utility overhead/underground
• Numbering/labeling of signal infrastructure assets on all layout sheets
• Show photo enforcement equipment (red camera) if applicable
• Preemption (If needed)
POLE LOCATION & NUMBERING
NEMA PHASING

Major Street

Minor Street

Major Street Runs North-South

Minor Street

Major Street

Major Street Runs East-West

N
TRAFFIC SIGNAL DESIGN PLAN

• Respond to city comments
• Resolve any utility conflicts
• Circulate for signatures
• Submit (deliver or mail)
  1. Electronically archived files (USB – AutoCAD and 11” x 17” PDF)
  2. 11” x 17” hard copy of signed and sealed plans
Contact Information

For any further questions, you may contact

Kassem Elkhalil, P.E.
Email: Kassem.ElKhalil@fortworthtexas.gov
Phone: 817-392-8742
Objectives

- Street Light Overview
- Street Light Policies
- Street Light Design Requirements
- Pre-Qualified Contractors
Street Light Overview

• City of Fort Worth owns & maintains lighting system
  • Utility agreements are for CFW ownership and CFW system access
  • CFW owns poles, foundations, arms, wires, & lights

• Citywide Lighting Analysis estimates 67,000 lights
  • 41,000 Neighborhood
  • 22,000 Arterial
  • 4,000 Texas Department of Transportation (TxDOT)
Street Light Policies

- 2001 – Policy for the Installation of Community Facilities Agreement (CFA) adopted
- 2005 – CFA Section VIII Street Light Policy revised
- 2012 – Street Light Standards Update: decorative pole selection
- 2014 – Policy 31.29 Street Lighting adopted:
  - Adopted CFA Policy & LEDs become standard fixture
- 2018 – Policy 31.29 Update: existing structural supports and in-kind materials may be used
Street Light Policies: Decorative Poles

City Hall

Berry

Washington

Oleander/ Arlington

Terrell Heights

Saturn/W 7th
Street Light Design Requirements

• Street Light Checklist

• Standard Detail Sheets
  • D621 – Street Luminaire Pole and Fixture Details
  • D622 – Street Luminaire Pole Foundation Details
  • D623 – Street Luminaire Riser Connection Details
  • D624 – Street Luminaire Conduit and Ground Box Details
  • D625 – 240-480 Volt Single Phase Metered Pedestal

• Street Light Luminaire Specifications
  • Arterial – 200W HPS Equivalent
  • Freeway – 400W+ Equivalent
  • Residential – 100W Equivalent

• Construction Specifications
Pre-Qualified Contractors

• Requirements
  • Annual Financial Statement
  • References
  • Equipment Schedule
  • Contracting Experience

• Renewal Process
  • Required every 2 years
  • Submit Annual Financial Statement

• Contact: Kourtney.Davis@fortworthtexas.gov
Contact Information
For any further questions, you may contact
Kourtney Davis, Graduate Engineer
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Phone: 817-392-6753
ROUNDABOUT DESIGN
Objectives

• Design Guidelines
• Additional Documentation
• Process
City of Fort Worth Design Guidelines

***Diameters may vary based on site constraints and differing design and accommodation Vehicles***
Design Guidelines Contd.

<table>
<thead>
<tr>
<th>Lane Discipline</th>
<th>Case 2</th>
<th>Case 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Trucks in Peak Hour per Approach (WB-62 or larger)</td>
<td>&gt;120</td>
<td>&gt;120</td>
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<tr>
<td>Context</td>
<td>Suburban / Rural Light Industrial Heavy Industrial</td>
<td>Suburban / Rural Light Industrial Heavy Industrial</td>
</tr>
<tr>
<td>ICD(^{(1)})</td>
<td>160 – 205 ft</td>
<td>175 – 210 ft</td>
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<tr>
<td>Entry Width</td>
<td>28 – 32 ft</td>
<td>28 – 34 ft</td>
</tr>
<tr>
<td>Circulatory Roadway Width, F-F</td>
<td>26 – 28 ft</td>
<td>28 – 34 ft</td>
</tr>
<tr>
<td>Inner Circulatory Lane Width</td>
<td>12 – 13 ft</td>
<td>13 – 15 ft</td>
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<tr>
<td>Outer Circulatory Lane Width</td>
<td>12 – 15 ft</td>
<td>15 – 19 ft</td>
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<tr>
<td>Exit Width</td>
<td>26 – 28 ft</td>
<td>28 – 32 ft</td>
</tr>
<tr>
<td>Approach Gore Width</td>
<td>2 – 6 ft</td>
<td>4 – 8 ft</td>
</tr>
<tr>
<td>Controlling Radius(^{(2)})</td>
<td>&gt;70 ft, 110-130 ft typical</td>
<td>&gt;70 ft, 110-130 ft typical</td>
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<tr>
<td>Controlling Radius Length</td>
<td>70+ ft</td>
<td>70+ ft</td>
</tr>
</tbody>
</table>

Multilane (Two-lane) Case 2, or Case 3 Design Criteria – Table 2
Additional Documentation Required

- **Design Parameters**
  - Design approach speed
  - Number of Lanes
  - Design vehicle

- **Traffic Volume to support Roundabout Layout**
  - Number of Lanes

- **Performance Check**
  - Fastest Path Analysis
  - Auto turn Analysis to support design vehicle
Process:

- Follow design guidelines
- Submit plans to city including additional documents for review
- Project Manager will submit a request for Peer review through Capital Delivery Division to MSA for collector and major thoroughfare only.
- Task Order for the Peer review is generated
- Once peer review is complete, either a meeting is held with the designer or the comments are forwarded to the designer.
Contact Information

For any further questions, you may contact

Lissette Acevedo, PE, PTOE, PMP

Email: Lissette.Acevedo@fortworthtexas.gov

Phone: 817-392-2722
Questions?