LED lighting Panel

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LED Streetlight Upgrade - Arlington

• Project Manager: Mindy Carmichael, P.E.
  • Director of Public Works and Transportation

• Project: Retrofit high wattage HPS to low wattage LED streetlights

• Goal: Generate significant energy savings and reduce carbon footprint
Existing Streetlight System

• Arlington owns its streetlight system
  21,478 High Pressure Sodium (HPS) streetlights

• Arlington streetlights are not metered. Cost is based on assumed average kWh usage per month per specific wattage in accordance with Oncor Electric Schedule D Tariff

• Rates set by REP and Oncor
Goals and Objectives

- Plan, Manage, and Maintain Infrastructure
  - Objective: Optimize Effectiveness and Efficiency of Existing Transportation System
  - Objective: Complete Construction Projects in a Timely Manner

- Optimize – Reduce energy and maintenance costs
- Optimize – Improve streetlight reliability
- Convert over 20,000 City owned streetlights to LED
Streetlight Background

- Streetlights consumed 20% of citywide electricity
  - $1.6 million per year
  - 3rd largest consumer

- Limited Maintenance Resources
  - $800 thousand per year to keep lights working
Where do you go from here?

- Early streetlight pilots
- Focused solution investigation began May 2014
- Partnered with OpTerra Energy Services (formerly Chevron Energy Solutions)
Solution Development

• Solicitation of RFP
• Score cards for seven vendors
  • 0-5 score
  • Total cost of ownership, initial investment, warranty, photometrics, efficiency, range of wattages, made/assembled in America, references, years in service, quantity of installations
• Team selection to shortlist of three
  • Pilot demonstration / photometrics
  • Oral presentation
  • Final selection
• Phased implementation to accommodate tariff constraints
Implementation

• **PHASE I (2015):** Retrofit approx. 10,500 cobra heads (150W - 200W to 95W LED)
  - Tariff friendly streetlights; 49% of 21,474 total count
  - 7-pin receptacle for future control technologies
  - Update streetlight database with pole locations & new fixture info
  - Inventory survey conducted during installation

• **PHASE II (2016):** Retrofit approx. 320 Entertainment District lights, 310 cobra heads (250W), and 210 high mast fixtures.
  - Not tariff friendly streetlights
  - Required metering to generate savings
Investment

• Streetlights bundled with other major component replacements at 21 City buildings

• Combined program – leverage streetlight savings to upgrade other city components
  • Total amount of improvements = $10,520,980 ($4,875,000 LED)
  • Financed at 2.5% over 15 years
  • Total first year savings - $754,400 ($445,000 LED)
    • $711,000 in utility costs ($430,000 LED)
    • $43,000 in operational costs ($15,000 LED)
    • Saves more than $14,000,000 over 15 years
Total Project Results

- Reduced kWh by 47%
- Reduced streetlight maintenance costs
  - $15,000 estimated materials savings
  - Increases life cycle from less than 25,000 hours to 100,000 hours
- Reduced carbon footprint
  - CO2 down 2,383 tons
  - SO2 down 5.2 tons
  - NOx down 4.7 tons
  - Equivalent to removing nearly 385 passenger vehicles from the road per year or planting over 46,919 tree seedlings
Green Oaks Boulevard

Before

After
Green Oaks Boulevard

Before

After
Contemplated Next Steps

• Retrofit remaining streetlights 10,400+
  • Coordinate friendly tariff with ONCOR
  • 100W residential streetlights
  • Include decorative fixtures

• Energy savings + capital improvement = Win+Win