



LED LIGHTING STUDY CITY COUNCIL MEETING

DISCUSSION AGENDA

- How did we get here?
 - City of Boerne Utilities LED pilot project and lighting study history
- What has changed in the last 8 years?
 - Additional manufacturers, technology, cost, etc.
- Project status update
 - Study update, options for LED replacements, next steps

HOW DID WE GET HERE?

- The City of Boerne Utilities completed a pilot project in the English Oaks subdivision by installing several sizes of LED and HPS luminaires for street lighting.
- Schneider Engineering prepared the Street Lighting: LED vs. HPS White Paper in November 2010.
 - Included visual comparison between the LED and HPS fixtures as well as actual foot-candle measurements.
 - Evaluated the equipment costs and electric usage costs for both the LED and HPS luminaires and prepared a cost comparison with possible cost savings payback scenarios.
 - The results showed that the most economic route would be to replace the 250 W HPS fixtures with 100 W HPS fixtures
- Ultimately, the City decided not to pursue widespread installation of LED lighting due to the long payback periods and proceeded with the study results by replacing the 250 W HPS fixtures with 100 W HPS fixtures.

WHAT HAS CHANGED IN THE LAST 8 YEARS?

- Additional manufacturers and availability
 - The pilot project and previous study focused only on using the GreenStar™ LED luminaires.
 - More manufacturers and more options for the different LED luminaires.
- Technology
 - Increases in light output and wider variations of color
 - Improvements on energy usage – more lumens with less watt usage
 - Better reliability
- Cost
 - Initially, LED fixtures could cost as much as 5 times the cost of a HPS fixture, today they are almost the same cost and in some instances could be cheaper

PROJECT STATUS UPDATE

- Updated LED lighting study with the following determinants:
 - Updated costs estimates from two vendors for 100 W and 250 W equivalent LED fixtures (prices are comparable)
 - Calculated payback based on three scenarios:
 - Replacement of failed HPS fixtures with LED fixtures
 - Replacement of failed HPS bulb with a new LED fixture
 - Replacement of HPS fixture in working condition with new LED fixture

PROJECT STATUS UPDATE

- Review replacing 486 HPS fixtures with LED fixtures
 - 340 – 100 W HPS
 - 85 – 250 W HPS
 - 61 – 175 W Mercury Vapor
- Antique decorative lights are not being considered at this time
- General consensus – 100 W LED equivalent is not enough light, cost analysis will focus on using a 250 W LED equivalent for replacements
 - Some LED fixtures could be set at 175 W

PROJECT STATUS UPDATE

PAYBACK SCENARIOS			
COST AND SAVINGS	REPLACING FAILED HPS FIXTURES WITH LED FIXTURES	REPLACING FAILED HPS BULBS WITH LED FIXTURE	REPLACING WORKING BULBS AND FIXTURES WITH LED FIXTURES
Incremental Costs Range	\$15 - \$126	\$387 - \$390	~\$494
Annual Energy Savings Range	\$3 - \$52	\$3 - \$52	\$3 - \$52
Annual Maintenance Savings Range ¹	\$60 - \$78	\$15 - \$16	\$15 - \$16
Payback Ranges (years) ²	0.1 years - 2 years	5.8 years - 20 years	7.3 years to 25.6 years

1. Based on 10% failure of LED fixtures experienced by COB
2. Incremental cost / (Annual Maintenance Savings + Annual Energy Savings)

*Note: LED fixture considered is a 250 W equivalent

**Note: Range is per fixture

***Note: Wide range of paybacks due to the fact that many 100 W HPS fixtures have already been replaced, so energy savings has already been realized.

PROJECT STATUS UPDATE

REPLACE WORKING HPS FIXTURE WITH LED FIXTURE ON ENTIRE SYSTEM

COST AND SAVINGS	REPLACE HPS WITH LED*
Incremental Cost ¹	\$240,100**
Annual Energy Savings	\$6,500
Annual Maintenance Savings ²	\$7,800
Payback (years) ³	16.8

1. LED fixture cost + Installation Labor * Number of fixtures
2. Based on 10% failure of LED fixtures experienced by COB
3. Incremental cost / (Annual Maintenance Savings + Annual Energy Savings)

*Note: LED fixture considered is a 250 W equivalent

**Note: The total cost is for LED fixtures only and does not include any pole replacements, extension arm replacements, photocells, or any other costs that may be required for the LED installation.

LED LIGHTING UPDATE - CONCLUSIONS

- Replacement of failed HPS fixtures with LED fixtures has short payback period of 2 years or less.
- Replacement of failed 250 W HPS bulbs with LED fixtures has payback of less than 6 years BUT replacement of failed 100 W HPS bulbs has payback of 20 years because of low annual energy savings.
- Replacement of a working 250 W HPS with an LED fixture has a reasonable payback of around 7 years; however, replacing a working 100 W HPS with an LED fixture has a payback greater than 25 years.
- The wholesale replacement of HPS fixtures on the system with 250 W LED fixtures is estimated around \$240k for the fixture replacement alone with a payback close to 17 years.

LED LIGHTING UPDATE – NEXT STEPS

- LED lighting has improved in the last 8 years in cost and technology.
- Many utilities have migrated to LED lighting.
- City of Boerne can begin migration by:
 1. Deciding on preferred course of action for replacement – wholesale replacement vs. replacing as old fixtures expire.
 2. Prepare material specification for LED fixtures – Schneider Engineering will assist.
 3. Issue Request for Proposal for LED fixtures and labor contract for replacements – Schneider Engineering will assist.

QUESTIONS / DISCUSSION



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