

Tacoma Police Headquarters LED Lighting Upgrades Case Study



LEED-Certified Tacoma Police Department Warehouse Saves with LED Upgrades

Project Background & Scope

The City of Tacoma launched its Climate Action Plan in 2008, with goals and strategies to reduce its carbon footprint. The Tacoma Police Department's fleet warehouse is LEED-certified and the Headquarters building is LEED-certified silver. This emphasis on sustainability helped Christopher Bostain, Lead Facilities Maintenance Mechanic at the Police Department, convince management to undertake an LED lighting retrofit project despite high initial costs. Tacoma Public Utility's lighting incentive program made the installations of LED parking lot lights, LED wall mounted lights and LED floodlights more affordable. The whole project took 1.5 years and was completed in the summer of 2011. Specifically for the parking lot lights, the projected annual maintenance cost savings of \$3,000 - \$4,000 per year was a key factor in the project's approval. Tacoma Public Utilities originally calculated a 17 year payback period for the parking lot lights factoring in electrical savings only. When annual maintenance savings and utility incentives were included, Bostain calculated the payback period at 7 years. Payback periods are much shorter today.

Bostain researched LED parking lot lights himself. He purchased one LED fixture each from three different manufacturers and had them installed in three separate locations in the parking lot. He performed a photometric analysis of each fixture, which showed them all with approximately the same light levels and wattage. However, he preferred the higher 4500K color temperature of the CREE BetaLED fixture, compared to the 3500K of the existing lights. Other selling points of the CREE BetaLED were the finish, which is a dark bronze that matched the existing poles, the price, the efficacy and that it was a domestic made product. The city was seeking were lower maintenance costs, more security features, uniform lighting and energy savings.



Security will be enhanced with the longer life of the LED fixtures, because sometimes numerous metal halide lamps would fail before being replaced, due to the high replacement cost.

In the parking lot, 28 metal halide fixtures were replaced with 23 CREE BetaLED fixtures. The two 250W metal halide heads on each of the five poles in the middle of the parking lot were replaced with one large 228W LED head. The 18 perimeter 250W metal halide lights were replaced with 160W LEDs.

Utility incentives of \$4,800 were provided for the parking lot luminaires, which had an initial cost of \$27,600. Annual savings for the parking lot lights is estimated at 23,500 kWh/year.

The outdoor lights are operated by timer and/or photocell control. The lights are on all night long, which averages out to 12 hours a day for the year. Actual energy savings have not been calculated, as energy use for the outdoor lighting is part of the energy bill for the entire facility. However, power rates have gone up approximately 10% since the installation and the electric bills remain low.



Results

Bostain is happy with the new lights and has heard nothing but positive comments such as how bright they are and the pleasant color temperature. Reduced maintenance was a large selling point for the retrofit. Indeed no maintenance has been required since completion of the project in the Summer of 2011, aside from one immediate failure that was handled under warranty. There have been no complaints. Police often work in their vehicles or out of their trunks and some officers mentioned how nice it was to have bright lights and be able to see. The desk officer who scans the security cameras said he could see more with the new lights – the quality of the light is better for video playback.

Lessons Learned

Perform a photometric analysis of a site to ensure appropriate light levels are achieved and the site is not overlit.

People interested in viewing these lights can do so from the street at night but may not enter the parking lot because it's a secure facility.

Additional Resources

Facility

Tacoma Police Headquarters

Address

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Contact

Christopher Bostain

Lead Facilities Maintenance Mechanic

Utility

Tacoma Public Utilities

Considerations for Purchase

Before purchasing LED lighting:

- Understand warranty coverage and length. Coverage might include various components, field repair, shipping and labor, over 5 to 10 years. Warranty eligibility may require multiple LEDs to fail before replacement.
- Install a sample before committing to a purchase.
- Check your local utility for available incentives.
- Engage a professional to provide lighting that meets your needs, complies with energy code, and is compliant with utility incentive requirements.

Most utility incentives for LED lights use a qualified list:

- For light bulbs, look for ENERGY STAR products: http://www.energystar.gov/index.cfm?c=manuf_res.pt_lighting
- For commercial light fixtures, refer to Design Lights Consortium qualified product lists: <http://www.designlights.org>

Additional questions to ask are listed at this U.S. Department of Energy website: <http://www.eere.energy.gov/buildings/ssl/what-to-ask.html>

