

Sumner School District LED Lighting Upgrades Case Study



Sumner School District benefits from energy efficient LED upgrades in schools across the district

Project Background & Scope

The Sumner School District, located between Tacoma and Mount Rainier, has been upgrading their facilities to be more energy efficient. Since 2009, Jay Donnaway of Sound Environmental Consulting has been employed as a Resource Conservation Manager (RCM) by the district plus a few other public entities. To lower the cost of frequent lamp replacement in the parking lot lighting, and also to save energy, Donnaway chose LED lighting to replace the existing metal halide (MH) lighting.

Nine sites that were older and not recently renovated were chosen – eight schools and one support facility. The old parking lot lighting systems comprised 194 MH fixtures, each using 456 Watts and operating 3,200 hours per year. Neighbors complained that the overnight lighting was too bright. By upgrading to bi-level LED lighting, the school district expects to save energy, reduce maintenance costs, improve security, improve aesthetics, and reduce the complaints of neighbors. A short list of recommended replacement fixtures from the lighting company Light Doctor included two LED models and one T-5 model. Donnaway chose the BetaLED LEDway Streetlight – Type II Medium model.

The T-5 fluorescent fixtures were dismissed for multiple reasons:

- Fixture price was comparable for LED and for T-5.
- The wet climate might cause condensation problems;
- The bi-level option with two ballasts and five tubes per fixture meant more potential failure points,
- Lifetime hours were the same as the old MH fixtures,



Sumner High School

- The larger luminaire might invite vandalism. The LED luminaire selected, the BetaLED Model STR-LWY-2M-HT-05-D-UL-SV-700-HL-R, has five modules of 10 LEDs apiece. The fixtures include bi-level occupancy-based control, consuming 20 Watts each at low intensity and 142 Watts each at high intensity. The fixture switeches to high light levels instantaneously when motion is sensed, by a car or person. After detecting no motion for five minutes, the fixture switches back to low-output. On and off times for the lights in each parking lot are scheduled by the building manager.

As part of the same project, LED and CFL wall packs were installed at a number of the schools, with the same 4000K color to add uniformity and help distinguish campuses from neighboring properties. The cost of the retrofit was funded in part by an Office of the Superintendent of Public Instruction (OSPI) grant and Puget Sound Energy incentives.

Results

All comments about the new lights have been positive. There was initial concern that the LED lights might be too dim, but that proved unfounded when the motion sensors were tripped and the lights became brighter. In fact, the motion-sensing feature adds a security factor. The sensors have proven resistant to false activation by animals or wind, but are very reliable when a person or car enters the zone. No one has complained that the five-minute bright period is too short.

Aesthetically, the 4000K color temperature is a good match for moonlight and adds a calming effect to the campuses at night. Light is distributed more evenly across the lots, which improves visibility even though the light intensity was reduced.

Since the original installation, there have been two failures due to a poorly installed fuse. These fixtures were replaced under warranty.

Projected electricity savings with the new LED lighting is 263,095 KWh per year based on the following calculation:

- MH: 194 luminaires x 456 Watts x 3,200 hours = 283,085 kWh
- LED retrofit: (194 x 142W x 320 hours high intensity) + (194 x 20W x 2,880 hours low intensity) = 19,990 kWh

The school district is saving additional energy by limiting the time that the lights are on. All exterior and parking lot lights are shut off 15 minutes after the last custodian leaves, and the lights come back on 15 minutes before the first custodian is scheduled to arrive.

Lessons Learned

Get price quotes for multiple products for comparison. Donnaway initially expected T-5 fluorescent fixtures to be less expensive than LED, but obtained competitive prices for the LED fixtures.

Additional Information

Lighting Project Locations

All sites are open to the public at night, although some are gated. Call Marina Tanay at 253-891-6305 to request a late appointment. The parking lots go dark at 11:15 p.m. or 12:15 a.m., and at most locations exterior lights turn on again at 5:30 a.m.

Below is the list of Sumner School District sites with retrofitted LED parking lot luminaires.

- **Bonney Lake High School**
10920 199th Ave. E., Bonney Lake 98391
- **Crestwood Elementary**
3914 W. Tapps Dr., Bonney Lake 98391
- **Daffodil Elementary**
1509 Valley Ave., Sumner 98390
- **Emerald Hills Elementary**
19515 S. Tapps Dr. E., Bonney Lake 98391
- **Liberty Ridge Elementary**
12202 209th Ave. Ct. E., Bonney Lake 98391
- **Maple Lawn Elementary**
230 Wood Ave., Sumner 98390
- **Mountain View Middle**
10921 199th Ave. Ct. E., Bonney Lake 98391
- **Sumner High School**
1707 Main St., Sumner 98390
- **Support Services**
19701 104th St. E. Bonney Lake 98391

Product

LEDway Streetlight – Type II: <http://www.betal.ed.com/RuudBetaLed/media/RuudBetaLedMediaLibrary/PDF%20Files/US%20Spec%20Sheets/STR/led-street-light-2m-ht-04-06.pdf>

Manufacturer

BetaLED's parent company, Ruud Lighting, was acquired by Cree: <http://www.betal.ed.com/us-en/home.aspx>

Contractor

Shane Petitt at Light Doctor, www.lightdoctor.com, spetitt@lightdoctor.com

Utility

Puget Sound Energy



LEDway Streetlight Type II

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>