

ECHELON HELPS UC DAVIS **CUT ENERGY COSTS BY 86%** WITH CAMPUS-WIDE INTELLIGENT LIGHTING UPGRADE

Project Highlights

Energy savings
86%

15-year energy cost savings
\$1,369,155

15-year maintenance cost savings
\$444,480

Occupancy rate
20-59%



In 2010, UC Davis established the Smart Lighting Initiative in an effort to reduce campus-wide lighting consumption by at least 60% below 2007 levels. The first phase of the program included a large-scale deployment of over 1,500 network-controlled LED streetlights, area lights, post tops, and wall packs. The lighting installation with controls has reduced annual energy use by an estimated 1,231,758 kWh, saving \$120,909 annually in energy and maintenance costs. Although the project team did not specifically measure the additional savings attributable to the lighting controls, project data suggests that these incremental savings contributed an additional 20-40% beyond the savings captured by the LED upgrade alone.

The Challenge

Like many university campuses, UC Davis is illuminated by different types of outdoor lighting fixtures that were installed throughout the development and expansion of the campus. These fixtures use a variety of light sources, including high-pressure sodium (HPS), metal halide (MH), induction, and LED technologies. All are controlled by photosensors or scheduling controls to prevent energy waste during daylight hours, but some lack occupancy, tuning, or scheduling controls that could save energy during nighttime hours of operation. Most campuses have limited bandwidth to research new technologies or scope and execute large-scale lighting projects to achieve greater energy savings.

Content from this case study was previously published in "Campus-Wide Networked Adaptive LED Lighting" by the California Lighting Technology Center (CLTC), UC Davis in July 2014.
Photo credit: Kathreen Fontecha/CLTC, UC Davis



Innovative Team for Intelligent Lighting Solution

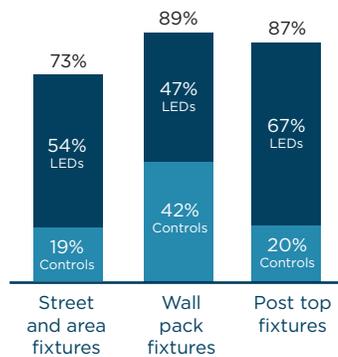
UC Davis Design Construction Management (DCM) contracted with Sacramento electrical design house Peters Engineering to audit the campus’s exterior lighting, develop a baseline measurement of pre-retrofit energy use, scope the size of the retrofit, and design the retrofit. The university selected Echelon to supply the radio frequency (RF) network control system. Other lighting system components including street and area fixtures, wall packs, post top fixtures, and outdoor motion sensors were purchased from other lighting manufacturers.

ITS Republic carried out the fixture and controls installations and the initial commissioning of network controls, after which UC Davis Utilities took over ownership and maintenance of the system with the support of UC Davis’s DCM and Facilities Management departments, Echelon, and California Lighting Technology Center (CLTC).

The Results

The campus-wide lighting retrofit at UC Davis reduced outdoor lighting energy use by 86% on average, surpassing the 60% goal set by the campus. It also now provides extensive maintenance savings and energy monitoring services. Retrofits addressed 1,347 street and area fixtures, 101 wall packs, and 86 post top fixtures.

Energy Savings with LED + Controls Upgrade



For street and area lighting across the campus, the standardization to LED technology and the advanced programming features available through the *Lumewave by Echelon™* control network reduced lighting energy use by 73%, with approximately 19% due to controls. The new LED wall packs automatically dim during vacant periods, so they operate at just 20% of full lighting power when in standby mode. High-end trimming allows the fixtures to be programmed through the network, so they operate at 80% or 90% of full power output when occupants are detected. The *Lumewave by Echelon* control system measured energy savings of 89% for the LED wall packs, with approximately 42% of savings due to controls. Data collected through the control network reported energy savings of 87% for the LED post top fixtures, with approximately 20% due to controls.

“Any large facility could save a lot of energy and money with a system like the one at UC Davis,” says Scott Arntzen, Senior Project Manager with UC Davis DCM. “We’re exceeding what we anticipated in terms of kilowatt-hour savings.”

Learn More

For more information about *Lumewave by Echelon* products call +1 408-938-5200 or visit www.echelon.com.

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