

## LED APPLICATION: Parking Lot Lighting–Retrofit



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*David J. Wahr  
Principal of the JDC Manchester Limited Partnership, shopping  
center owner, and president of CW Companies*

## LED PRODUCTS



### 25 BetaLED area luminaires

- Type III optics; direct arm mount;
- 6 light bars and 120 LEDs
- Two-level occupancy sensor

## BENEFITS

- Energy costs are expected to be lowered by 58 percent.
- 47 percent reduction in light levels while meeting IESNA illuminance recommendation.
- Estimated energy reduction of over 44,000 kWh and \$6,000 annually.
- Contribution to a \$10,000 reduction in annual maintenance costs.
- An approximate three year payback is anticipated.

### High ROI for Parking Lot Lighting Retrofit



In its commitment to energy savings, sustainability and lowering energy costs, a T.J.Maxx shopping plaza owner has retrofitted the retail mall parking lot with BetaLED luminaires. CBT Development was incurring high costs for parking lot maintenance from frequent lamp replacement in high pressure sodium (HPS) and metal halide (MH) fixtures. While poor power quality was causing the premature lamp failure, the developer was ready to replace the 25-year-old luminaires with new, efficient technology.

“In the past four years, we’ve spent approximately \$40,000 maintaining the exterior lights. Most of that was spent on bulb and ballast replacement,” said David J. Wahr, a principal of the JDC Manchester Limited Partnership, the shopping center owner, and president of Woburn, MA-based CW Companies.

CW Companies teamed with CBT Development Consultants, BetaLED and the DOE to design the shopping center’s LED lighting system. Using existing poles and pole locations, the parking lot was retrofitted with 25 of BetaLED’s THE EDGE area square luminaires that replaced 28 HPS and six MH luminaires, both 400-watt.

The area luminaires include BetaLED’s optional integrated occupancy sensors to provide the flexibility of reducing energy consumption when the lot is unoccupied during night time

hours and raising the illumination levels when occupants are present. Use of the integrated option, which reduces the level of lighting from a 525 mA high output to a 175 mA low output, is estimated to reduce energy costs by approximately 58 percent compared to the previously installed fixtures.

A total energy and maintenance cost savings per year is projected to be over \$15,000. The calculation assumes that the BetaLED luminaires will operate for 12 hours per day (high mode for five hours and low mode for seven hours) and previous high maintenance costs will be significantly reduced. The estimated payback period for the installation is only three years based on the current electric rate of \$0.14/kWh, provided by the Public Service of New Hampshire (PSNH), and maintenance costs incurred at the property for the previously installed fixtures.

“We are projecting a savings of at least 44,000 kWh a year,” said Wahr. “At the current cost of about \$0.14 per kWh, this represents a savings of over \$15,000 annually. We will virtually eliminate \$10,000 in annual maintenance costs and we expect to recover our investment in equipment costs in three years.”

The energy savings is achieved from a combination of a higher efficacy luminaire solution that provides more precise target illumination compared to the HPS solution. Additionally, the BetaLED luminaires operate with an integrated two-level system that reduces the power level (in the low-mode) by approximately 66 percent while only reducing the illumination levels by approximately 50 percent. At this reduced level, the BetaLED lighting performance still meets the minimum 0.2 footcandle recommendation from the Illuminating Engineering Society of North America (IESNA).

A GATEWAY demonstration of this application was prepared for the U.S. Department of Energy by Pacific Northwest National Laboratory and can be studied for more detailed information: [http://www1.eere.energy.gov/buildings/ssl/gatewaydemos\\_results.html](http://www1.eere.energy.gov/buildings/ssl/gatewaydemos_results.html)