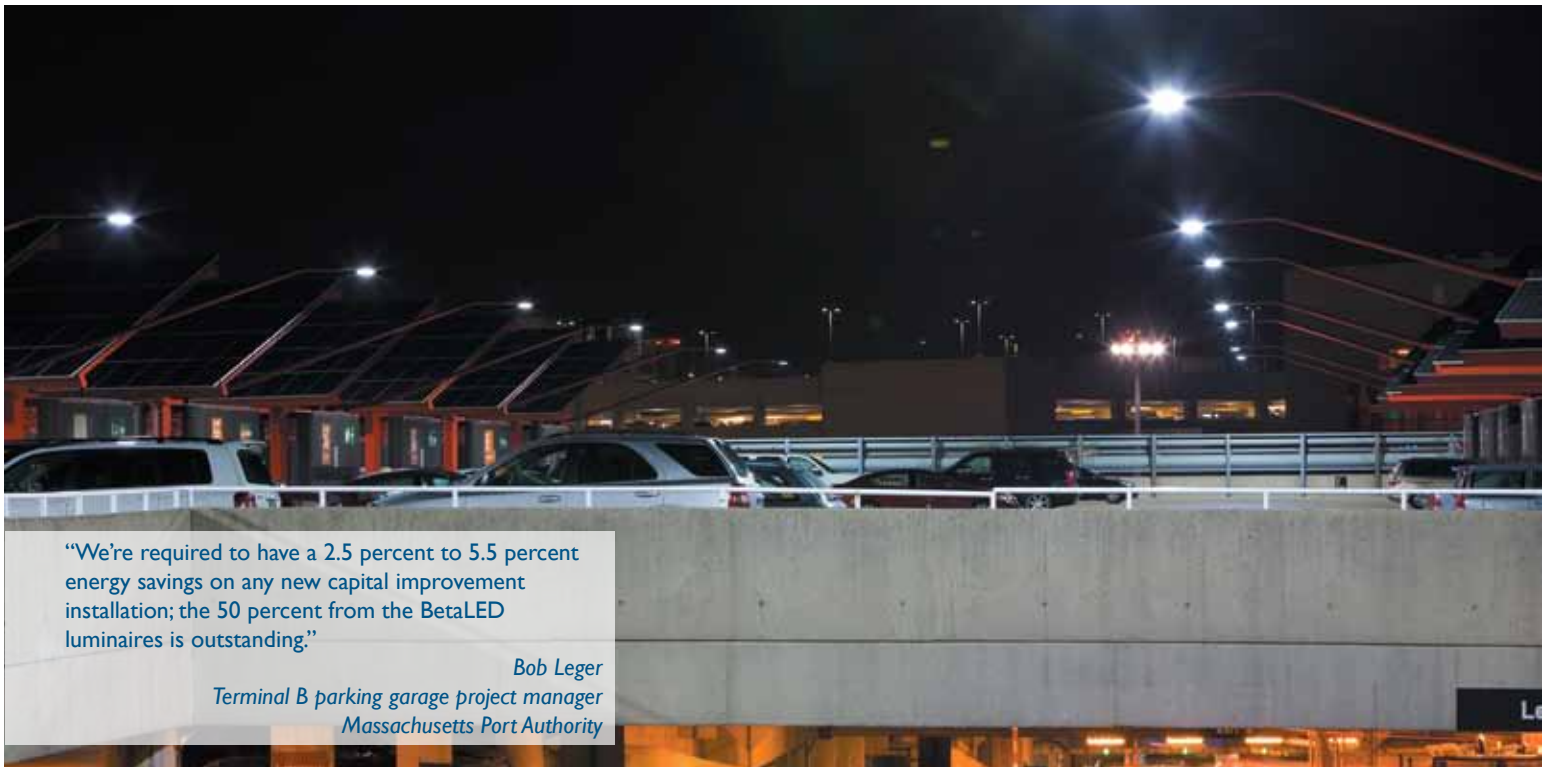


LED APPLICATION: Airport Parking Structure Lighting – Retrofit



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Bob Leger

*Terminal B parking garage project manager
Massachusetts Port Authority*

LED PRODUCTS



BetaLED area luminaires for parking lots:

- 50 with Type V optics and 240 LEDs
- 2 with 60-degree flood optics and 240 LEDs
- 8 with 40-degree flood optics and 240 LEDs
- 5 with 25-degree flood optics and 240 LEDs



BetaLED canopy luminaires for parking structures:

- 1,075 with Type V optics and 80 LEDs
- 613 with Type V optics and 120 LEDs
- 172 with Type V optics and 240 LEDs
- 83 with Type V optics and 80 LEDs
- 26 with 40-degree flood optics and 160 LEDs
- 20 with 40-degree flood optics and 120 LEDs
- 96 with 40-degree flood optics and 80 LEDs

BENEFITS

- 2,150 retrofit BetaLED luminaires will consume approximately 50 percent less energy (with use of an energy management program).
- Massport anticipates a savings of \$3.8 million in electrical use over the next 20 years based on \$0.12/kWh.
- The airport will recoup its investment in the LED luminaires in approximately 5.5 years.

Terminal B Garage Retrofit Lighting Project



Logan International Airport, owned and operated by the Massachusetts Port Authority (Massport), is New England's primary international and domestic airport. In May 2009, Massport approved \$55.7 million to rehabilitate the Terminal B parking garage that was constructed in 1974. The four-year project includes the installation of photovoltaic solar panels on the garage roof and the replacement of outdated high pressure sodium (HPS) lighting inside the garage.

Bob Leger, Terminal B parking garage project manager, knew there was better lighting technology available than HPS fixtures. Lighting engineer and project manager Dan Hallahan, LC, LEED-AP, of the engineering firm Fay, Spofford and Thorndike, worked with Omnilite, the local representative for BetaLED, and Massport to conduct a three-month study that included testing different luminaire technology. The study clearly revealed that BetaLED luminaires were the obvious choice for energy efficiency and improved illumination performance.

Leger estimates that the 2,000 retrofit BetaLED luminaires will use approximately 50 percent less electricity, about 2,261,218 KW-hours of electricity per year – than is currently used and will save approximately \$263,000 in energy costs this year alone; not including the maintenance savings from ongoing spot replacement of the HID lamps, which ran \$150 for each fixture. The anticipated energy savings includes use of an energy management program.

"We're required to have a 2.5 percent to 5.5 percent energy savings on any new capital improvement installation; the 50 percent from the BetaLED luminaires is outstanding," said Leger. "Additionally, the light is much brighter and more uniform compared to HPS fixtures." The airport will recoup its investment in the LED luminaires in approximately 5.5 years. Massport anticipates a savings of \$3.8 million in electrical usage over the next 20 years based on costs of \$0.12 per kWh.

Logan utilizes an energy management program throughout the facility. The Terminal B parking garage includes an occupancy detection system with over 500 sensors. On each level of the parking structure, the lighting control is divided into large sections, when occupancy is detected by a single sensor, all the lighting in that section of the garage powers "on"; when occupancy is detected within 80-feet of a neighboring section, the lighting [in the neighboring section] will power "on" as well. This allows drivers and pedestrians to avoid entering a dark area before the lights are on. However, no area will ever be completely dark – emergency lighting will always be on for safety and security.

Like most airports, Logan caters to the increased volume of daytime travelers. Using the energy management system, Leger and his team can reduce the airport's energy footprint by turning off lights during the night. With the occupancy detection system, at 1 a.m. approximately 25 percent fewer lights could be in use throughout the structure, at 2 a.m. 50 percent fewer; and at 3 a.m. 75 percent fewer until they are back up to full usage during the busy morning hours. The energy management system also utilizes daylight harvesting. For example, lights along the structure's perimeter that are exposed to daylight all power down when there is contribution from natural daylight.

"We couldn't implement the energy management system with metal halide lights because it takes time for them to warm up," said Hallahan. "With the BetaLED system, we have the advantage of instant on that is required for an on-demand system."

BetaLED offers an integrated occupancy sensor as an option on select luminaires. The two-level system capitalizes on the benefits of LED technology by extending the life rating of the luminaire. The sensor allows the luminaire to be dimmed to one-third total power while maintaining 50-percent lumen output. Compared to traditional high-intensity discharge (HID) lamps, the system can reduce a facility's annual energy and maintenance costs by up to 80 percent.