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TJ Maxx Shopping Center becomes one of the first to use LED lighting system

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The seven acre outdoor parking lot at the TJ Maxx Shopping Center on South Willow St. is one of the first in the country to be retrofitted with a light emitting diode (LED) lighting system. The new LED lighting system, which complies with U.S. Department of Energy (DOE) specifications, is anticipated to reduce energy costs by approximately 65% compared to the previous high pressure sodium and metal halide fixtures. The LED fixtures are equipped with motion sensors that reduce illumination levels and energy use during times of low activity or when the shopping center is closed.

For parking lot and shopping center owners, the use of LED lighting is not only energy efficient, the long life and reliability of LED light sources diminish maintenance costs and help increase profits through reduced labor and relamping expenses. LED fixtures also give out a whiter and more even light than the previous sodium vapor lights, significantly improving visibility and security for shopping center customers.

The TJ Maxx Shopping Center's LED system has been selected as a U.S. DOE Solid-State Lighting (SSL) GATEWAY Demonstration Project - the first in the Northeast. The purpose of the SSL Gateway Demonstration projects is to allow the DOE to determine the viability of LED lighting in commercial applications.

DOE uses a methodology/ reporting system to compare the LED (SSL) product against the existing lighting source and analyze energy savings, cost effectiveness, compliance with illumination standards, light output, photometrics, and modeled illumination levels.

"In the past four years, we 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 CW Companies.

"We are projecting a savings of about 33,000 KWH a year," said Wahr. "At the current cost of about \$ 0.16 per KWH, this represents a savings of over \$6,000 annually. Another cost benefit is that the LEDs have a projected life of about 150,000 hours of operation (about 15-20 years of normal use), which means virtually eliminating \$10,000 in annual maintenance costs. With a total project cost of approximately \$47,000 we expect to recover our investment in 2 ½ - 3 years." Although subsidies or tax benefits for conversion to energy saving technologies are available in many other states through state governmental agencies or the local power providers, none were available in the state of New Hampshire for this project.

LED is a technology on a very fast learning curve and could be in widespread use within five years. Studies suggest that a complete conversion to LED lights could decrease carbon dioxide emissions from electric power use for lighting by up to 50 percent in just over 20 years. It could potentially be

the most cost effective of a number of simple approaches to tackling global warming using existing technology, according to a McKinsey & Company report.

The green advantages of LED lighting

The TJ Maxx project showcases the "green" advantages of using LEDs for outdoor lighting. Manufactured in the US from recycled materials, the LED fixtures do not contain mercury or lead, reducing the danger and cost of disposal, do not emit infrared or ultraviolet radiation and are approved by the International Dark-Sky Association (the leading authority on light pollution problems and solutions).

Advances in LED technology led to final selection

JDC Manchester Limited Partnership began investigating the feasibility of using LED technology in the Fall of 2008. "At that time, LED design standards, testing and performance protocols were still being developed," said Wahr. "Through our research we became convinced that LED lighting was a reliable technology that fit into our plans to make our properties more compliant with sustainable development principles."

Wahr believes that within three to five years LED lighting will be required for all new commercial projects of this type. "LED technology is just getting better and, going forward, will become even more energy efficient and cost effective to install," he said. Cass Thurston of CBT Development Consultants agrees, adding, "Since the completion of the TJ Maxx Plaza Project in the fall of 2009, the feasibility of the commercial use of LED lighting has increased due to the availability of more efficient LEDs, a reduced product cost, and an increase in the number of reputable LED manufactures in the marketplace."

CW Companies teamed with CBT Development Consultants; BetaLED, an LED lighting system manufacturer; and the DOE to design the LED lighting system for the shopping center. The final lighting design, by DOE's Pacific Northwest National Laboratory, used the existing poles and pole locations with retrofitted BetaLED fixtures.

"We hope that by showcasing this project, we can help to better inform both public and private sectors that when upgrading existing facilities or designing new projects there are products currently available to help significantly reduce energy consumption," said Wahr. "This can go a long way in reducing our dependence of foreign oil."