

**AT A GLANCE**

Manchester-Boston  
Regional Airport  
Manchester, NH

**PROJECT**

LED Lighting System retrofit with  
new wireless controls system

**SAVINGS**

\$38,600 per year

*"The LED and wireless control solutions provided by Leading Edge Design has resulted in substantially better lighting and drastically reduced operating and maintenance cost while providing us with a web-based dashboard to monitor our usage, savings, and carbon reduction real-time. The projects has been a tremendous success story for the Airport"*

—John Adams  
Facility Manager

# Manchester-Boston Regional Airport Upgrades Terminal Lighting & Saves

## Background

Leading Edge Design Group collaborated with Public Service of New Hampshire (PSNH) on the first LED lighting retrofit project for the Manchester Boston Regional Airport (MBRA) in the summer of 2009. MBRA was experiencing increased maintenance costs, decreased energy efficiency, and inconsistent lighting output throughout the customer parking garage. Leading Edge Design Group retrofitted eighty 400W metal halide fixtures that provided the lighting throughout the Helix areas of the parking garage. Custom 40W LED light engines were manufactured to fit the existing fixture enclosures and photo sensors were installed to provide dawn-to-dusk control of these fixtures that had previously run 24 hours per day.

The project proved to be such an overwhelming success for MBRA that John Adams, the airport's facility manager, invited LEDG to investigate the opportunities available in the main terminal area of the airport campus. It was then determined to take a systematic approach for tackling the multiple opportunities for energy and maintenance cost savings in the lighting and control system(s) in the main terminal building- starting with the main entrance areas of the terminal.



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## Challenge

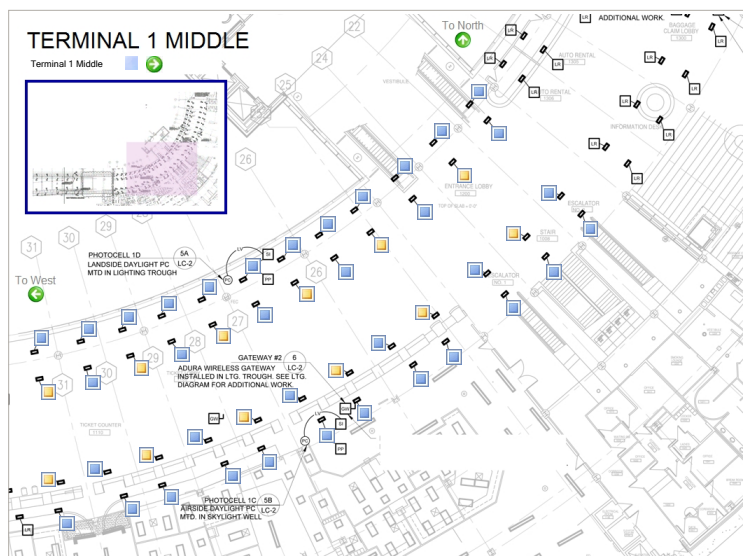
The management of airport campus lighting continues to create maintenance and costs issues for growing regional airports across the U.S. Competition is fierce with the larger markets, the maintenance workforce is spread thin, and there is continued pressure to decrease operational costs that erode the bottom line. Today, most lighting output runs 24/7 and creates an inconsistent replacement process for the maintenance staff and makes energy efficiency much harder to achieve.

## Solution

Leading Edge Design Group developed a solution for MBRA that would not only solve their current challenges, it prepares them for long-term growth and success. Utility companies, like PSNH, are working closely with airports and other organizations in their perspective states to help them take advantage of available energy-efficiency programs. For MBRA, PSNH provided support with the 'SmartStart' program that provides substantial project incentives. As the project began, working in an airport presented a few obstacles. Security is very tight throughout and subsequently all employees involved in the project had to participate in the security training program that is provided by the airport authority. Strict procedural processes had to be followed closely to avoid 'false alarms' that could create unwanted panic. Since the project covered the entire main terminal area, LEDG had to interact with all the employees working the ticket and rental car counters, the facilities team, security personnel and information technology staff, as well as the throngs of passengers, employees and others that are present on a daily basis.



Within 3 weeks, LEDG replaced a total of one hundred forty (140) 250W metal halide fixtures (290W connected load) that were mounted in soffit areas that extended from end to end of the terminal with state-of-the-art LED fixtures from Elumen Lighting Networks, each which have a connected load of 53W per fixture. The main function of these fixtures was to provide lighting into the vaulted ceiling spaces of the terminal. Since the existing lighting control system was dysfunctional and primarily designed to control fixture 'circuits' when in use, a cutting edge wireless control system from Adura Technologies was installed. This consisted of installing wireless relays at each fixture, daylight harvesters in the skylights and window walls of the terminal areas, wireless gateways and secure internet connections. The terminal area is approximately 600' long so it was divided into three 'zones' of equal size with integral sensors and gateways. The system was then commissioned according the parameters set by John Adams. As the sun rises and sets, the new LED lights will turn off as soon as there is ample daylight in the space and turn back on as the daylight diminishes. Changes to the program can be made via a laptop computer within the space, at the desk of John Adams, or from anywhere secure internet access is available.



## Savings

140 fixtures at 290 watts/fixture running 24 hours a day 365 days a year amounts to 355,656 kWh annually. At a cost of \$0.12/kWh, this results in annual operating costs of \$44,457.00. 140 fixtures at 53 watts/fixture running 24 hours a day 365 days a year amounts to 64,970 kWh annually. At a cost of \$0.12 /kWh, this results in annual operating costs of \$7,796.00. However, due to the wireless control system another 25% savings are achieved which lowers the annual operating costs to \$5,847.00 – or annual operating costs savings of \$38,610.00. Substantial savings beyond operating costs are to be achieved through reduced maintenances costs that are estimated to be \$11,515.00 annually. The 250 watt metal halide fixture has a lamp life of 10,000 hours whereas the Elumen LED fixture has lamp life of 65,000 hours – 6 ½ times that of the metal halide system!

## Benefits

The benefits of the new LED lighting and wireless control systems are plentiful. The outlined savings is obviously a major benefit, as well as the elimination of maintenance costs for years to come. The LED lighting system also provides a far superior quality and consistency of light throughout the terminal areas and also reduces the heat load and subsequent impact on the AC system. Perhaps the most impactful benefit is installation of the Adura wireless control system. With the wireless mesh control system in place, it can now be easily expanded throughout the entire facility and allow the airport to maximize its energy savings and maintenances costs in the years ahead. The Adura solution also provides a web-based dashboard that allows for real time monitoring and control of the lighting system, as well as historical information on energy savings, carbon reduction and percentage of connected load. An additional intangible benefit is the commitment by John Adams and his team to implement energy reduction measures while keeping within the confines of his budget.

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## About

Leading Edge Design Group is a leading national provider of energy optimization services that delivers significant energy savings to the public and private marketplaces through efficient data center designs and emerging LED lighting and wireless lighting control technologies. Founded in 2007 with the goal of pursuing, promoting, and providing the finest energy optimization solutions available, we help our customers minimize the environmental impact of their businesses while improving operational reliability and reducing costs. Leading Edge Design Group is dedicated to encouraging, challenging, and contributing to energy industry innovation with an ongoing commitment to our community and our environment. Visit us at [www.ledesigngroup.com](http://www.ledesigngroup.com) and connect with us on Twitter @ledesigngroup.