

New Lighting System Sends Penn Station on the Fast Track to Energy Savings

Pennsylvania Station, commonly known as Penn Station, has served New York City commuters for more than a century. Constructed between 1905 and 1910, the station is located in the underground levels of Pennsylvania Plaza in the heart of Manhattan. It stretches five levels below the city, encompasses approximately one million square feet and serves more than four million travelers a year.

Today, Penn Station, which sits below Madison Square Garden, is served by a number of passenger rail services including Amtrak (the station's owner), Long Island Rail Road, New Jersey Transit and the New York City Subway. For the past 15 years, Amtrak has initiated several renovation projects to improve the appearance of the station and help reduce its overall operating costs. Upgrades such as new paint, updated audio and visual information systems and security systems have helped create a welcoming atmosphere for tourists and passengers. But, improvements were still needed for the station's lighting system, which was no longer providing adequate light levels or meeting current energy standards.

When the lights go down in the city

The lighting system in Penn Station, installed more than 40 years ago, was a combination of metal halide, high-pressure sodium and incandescent lamps and fixtures. The lighting system, comprised of more than 3,000 fixtures and 5,000 lamps in the common/rotunda, service plant, baggage, vendor, maintenance and track areas, was a challenge to maintain. The lamps lasted different hours in each area of use, and more frequently than not, a large number needed to be replaced due to burnouts and color depreciation or color shift. This was very time consuming and potentially dangerous for the station's engineering and electrical personnel.



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"There are many lights in the "right of way" which makes it difficult to maintain," said Paul Fragiorgi, Amtrak Supervisor of Electrical and Mechanical Construction. "Improvements would make it easier and more efficient to keep these areas lit and maintained properly."

In addition to the routine maintenance costs, the lighting technology was not energy efficient and was putting an added strain on the city's power grid. Amtrak officials needed to find a light source that would reduce maintenance costs, improve energy efficiency and provide sufficient light levels to ensure passenger safety.

On board for better lighting

Amtrak has very proactive energy related management goals and has made some recent inroads in developing an aggressive and productive energy management plan for many of their locations.

Working directly for the Finance department, Mr. Robert Jones, Sr. Director of the Utilities Management group, organized a team of internal Amtrak employees from the Engineering, Real Estate, Transportation and Design Engineering departments who worked swiftly and efficiently to evaluate, specify and approve the project for implementation.

In March 2006, Amtrak consulted James Maitilasso of Quality Conservation Services, Inc. (QCS), experts in providing solutions for energy conservation and energyefficient lighting, to determine a plan to replace the outdated lighting system with new energy-efficient technologies. QCS, in an agreement with Con Edison in New York City, the region's energy supplier, had been completing similar energy efficient lighting projects to reduce energy consumption by other commercial customers.

"Saving nearly \$300,000 a year in energy costs, reducing our time performing relamping, in addition to the reduction of carbon dioxide emissions, all at no cost, was a no-brainer," said Bob Jones from Amtrak. "QCS's attention to detail and willingness to exceed our expectations was evident throughout the project. There were many challenges in Penn Station, from our passenger traffic to working in vendor spaces in cramped quarters."

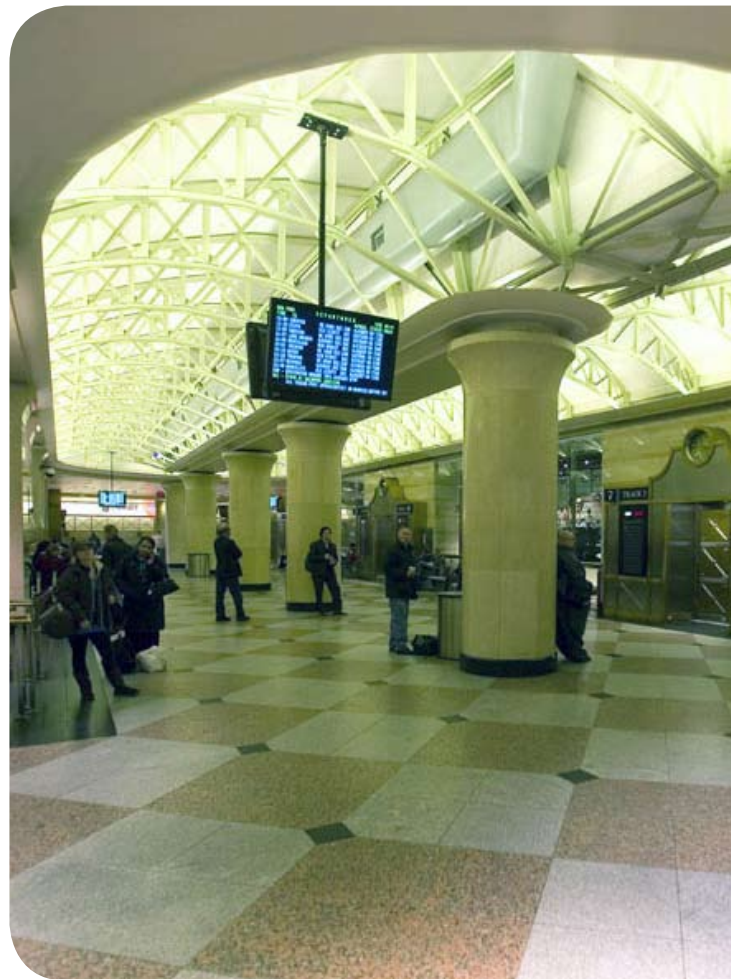
Maitilasso and his project management team, Mr. Lawrence Dukes and Ms. Karen West, had been working on developing this challenging project for some time and had begun designing preliminary solutions to best suit the stations' needs. These efforts were "shop tested" but could not be fully tested until the stations' technical evaluation was completed.

After a tour of Penn Station, Maitilasso and his team began exploring several commercially proven lighting systems that offer heightened light levels, energy savings and a longer

lamp life. In addition, he searched for a lighting manufacturer that would also cover several maintenance issues such as extended warranty, product and replacement availability and other unique requirements.

While examining the existing metal halide, high-pressure sodium and incandescent lighting system, Maitilasso realized that the age of the light fixtures would pose a problem. "The existing fixtures were just too old or too antiquated to house the new technology being considered. We determined that most of the installations would have to be modified and then retrofitted to make the energy efficient lighting system work," said Maitilasso.

Maitilasso consulted TCP, Inc., manufacturer of the most energy efficient lighting products in the industry, to determine an appropriate lighting solution. Maitilasso also included AM Conservation Group, Inc., one of the largest lighting distributors in the country to assist, given their large inventory and existing relationship with TCP.



“After assessing the current lighting system, we immediately saw areas to easily improve energy efficiency and boost the light levels, which were significantly dropping over the life of the lamps,” said Brad Wiandt, Director of National Accounts of TCP, Inc.

QCS recommended Penn Station relamp its facility with TCP’s energy efficient compact fluorescent lamps (CFLs) for more than 75% of the total project. In particular, TCP’s 289 series of commercial CFLs was recommended based on its long lamp life (10,000 hours) and very low failure rate at less than 0.5 percent.

During the renovation, the station was split into six distinct areas: the rotunda/common, service plant, baggage pass, vendor areas, maintenance and tracks. The lighting recommendation included everything from taxi stands and retail locations, like T.G.I. Fridays and Kentucky Fried Chicken, to train platforms and several tunnels.

With a variety of fixtures and applications, TCP’s product depth was crucial to the completion of the project. TCP’s 289 series was utilized in all six areas and installed in various fixtures including festoons, wall packs and sockets. In the rotunda, vendor, maintenance and track areas, the manufacturer’s two-watt LED kit was used for Exit signs. Recessed cans in the common and vendor areas employed other types of CFL technologies, such as spirals, PARS and higher wattage products to illuminate larger areas, such as escalators and outside entranceways. Conversely, three-watt cold cathode lamps, which last an estimated 25,000 hours, were installed in specialty fixtures within the vendor and restaurant areas.

In accordance with Amtrak’s emphasis on safety, QCS led extensive safety training sessions for all of its workers, which included six full-time electricians, three project/site managers and two managers in every shift. “Dealing with 40-year-old technology may require a unique ability to problem solve and make it work,” said Maitilasso.

Where current CFL technology wasn’t a sure fit, QCS worked with an OEM retrofit machining outfitter to develop innovative retrofit components to house the new technology. In more than half the site, a retrofit was required for proper installation.

In just the tunnels, Amtrak’s personnel replaced more than 1,700 fixtures with a long-term goal of installing more than 2,600 fixtures. QCS assisted in specifying these unique products as well as processing a significant rebate to buy down the cost of those improvements. This installation will save thousands of dollars in maintenance time and expense. In addition, the improved quality of the light source will eliminate the constant need to replace lamps, which will significantly improve the safety of Amtrak’s personnel. A light at the end of the tunnel

The relamping project took eight weeks to complete. Amtrak and QCS estimate the new lighting system will save an estimated 2.1 million kilowatts of energy each year and more than \$270,000 a year in energy costs.

In addition, the updated lighting system is also benefiting the environment. With its reduced electricity needs, Penn Station will account for 3 million fewer pounds of carbon dioxide, which will greatly reduce the amount of greenhouse gas emissions.

Overall, the lighting system is brighter and more vivid. In the main rotunda, paint color on the walls and columns that once appeared gray now shows its true blue color. In every area of Penn Station, the lighting system achieved greater light levels and improved phototics and scototics. Plus, with increased visibility and fewer dark spots, passenger safety and enjoyment has been improved.

In the end, Penn Station’s lighting system is on track for future energy savings and greater passenger satisfaction. ■

