



QUICK STATS

LOCATION	Princeton, New Jersey
ENROLLMENT	7,946 Undergraduate and graduate
CAMPUS	8,000,000 GSF
PARTNER SINCE	2012
SERVICES	Capital Program Management Energy Solutions

ENERGY AND
ENVIRONMENTAL SAVINGS

Campus Wide LED Lighting Efficiency Upgrade Program

As part of the Campus Wide Lighting Efficiency Upgrade Program designed to reduce carbon emissions, promote cost savings, and limit waste, Princeton University decided to convert more than 100,000 outdated lighting fixtures to more efficient LEDs in facilities across the campus. The overall program consists of converting more than 150 buildings to LED technology which includes the conversion of 7 million GSF of campus space. It also includes the installation of several lighting controls systems to optimize energy savings.

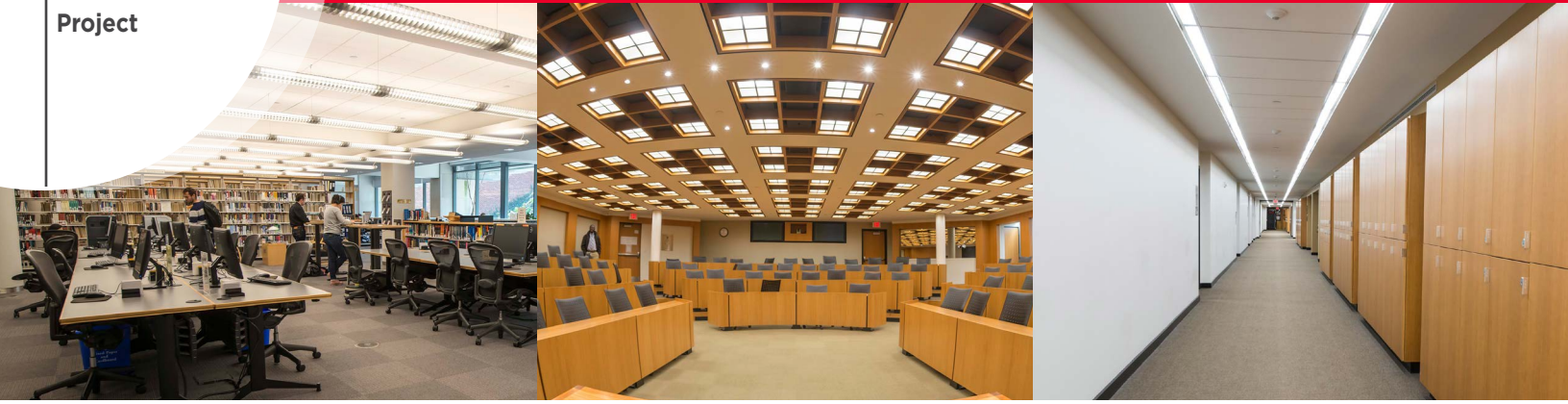
Aramark Project Managers ensure stakeholder satisfaction and work with various University Departments and Contractors to execute this large scale program. From scheduling, coordination and project logistics, Aramark Project Managers exceeded the customer service expectations of the faculty and supporting staff. In addition to providing project management services, Aramark project managers oversee the procurement and processing of all lighting related materials, negotiating directly with manufacturers to receive industry best pricing, improving the project paybacks.

To date, Aramark has saved the University in excess of \$500k in material processing, negotiated bulk pricing and through cost avoidance measures. These actions have supported the program to provide greater funding for more customized projects and better ROI's.

The Facilities Organization initiative, which began in July of 2014, is expected to be completed in December 2017 and could contribute as much as 15 percent toward the Princeton Sustainability Plan goal of reducing the University's carbon emissions to 1990 levels by 2020.

One of the largest and most visible LED projects in the program was the conversion of all 839 lighting fixtures in Jadwin Gymnasium. The project entailed a custom solution designed to compliment the architecture of the existing space and maximize energy savings. Since Jadwin hosts broadcasts of NCAA basketball games, the lights themselves had to meet rigorous standards for color rendering (CRI), spectral temperature, and spectral distribution.

Each fixture uses 100 to 170 fewer watts, saving 192kw over the entire installation. The new wireless control system will bring smarter, more flexible performance, providing even greater overall savings. The ballasts, aluminum, and glass from the old lights were fully recycled offsite, supporting the University's sustainability practices.



Challenges

Solutions & Results

Sustainability Needs



Through the implementation of the LED Program, Aramark Project Managers have supported the reduction of greenhouse gases but have also reduced maintenance waste, recycling thousands of lamps while eliminating hazardous waste (Mercury) associated with fluorescent lamps.

Restricted Installation Schedule



Aramark Project Managers have been able to deliver projects with challenging schedules. Whether it is to meet the needs of an upcoming sporting season or take advantage of opportunities to partner lighting projects with other campus initiatives, Aramark has been able to successfully and efficiently coordinate installation schedules to meet many of the scheduling restrictions presented on campus.

Promote cost savings and limit waste



By replacing the existing high bay fixtures in the Jadwin Gymnasium, Princeton University's energy management team estimates energy savings of approximately 40 percent. Controls optimization should add an additional 20 to 40 percent energy savings. It is estimated the total return on the investment in the Jadwin Gym Lighting Upgrade to be less than six years. Procuring and managing materials in-house provides financial benefits to the University but allows for excess material to be efficiently distributed to the next project, preserving final project costs and improving the ROI. These savings would otherwise be lost if managed by and procured through the contractor. Aramark has saved the University nearly \$400K in avoided contractor handling fees, not including material markup.

Safety through reduced maintenance



In addition to the significant cost savings of LED technology on the Princeton campus, the lighting upgrades will also lower the University's maintenance costs due to LED's life expectancy. The safety of the Princeton Facilities staff will also be reinforced by reducing the amount of time workers spend climbing ladders to replace thousands of burnt-out lamps each year.

Did You Know?

- Aramark's Energy Team provides technical support to assist the University staff in verifying and reporting energy savings to fulfill the application requirements for PJM Capacity reduction incentives.
- Aramark's Project Management efforts at Princeton University have been highlighted in several national publications including the May 2016 edition of Facilities Maintenance Decisions.