

SHOWCASE PROJECT: STATE OF RHODE ISLAND: WILLIAM M. DAVIES, JR. CAREER AND TECHNICAL HIGH SCHOOL

SOLUTION OVERVIEW

The William M. Davies, Jr. Career and Technical High School is a state-operated local education agency (LEA) governed by an independent, business-led Board of Trustees serving six districts. It was selected to undergo an energy efficiency upgrade to improve the lighting, ventilation and building control systems. As a result of this effort, the School is expected to realize a building energy savings of 37% with a savings of 67% in electricity consumption alone and an annual cost savings of \$147,000.

Davies opened in 1971 to serve the needs of students in the Blackstone Valley area with a capacity of 600 students. In 1992, a 100,000 square foot addition was constructed, doubling the size of the original building. Today, the facility is approximately 220,000 square feet, including a nine-room modular building and another laboratory next to the existing facility. The design of the new addition was predicated on the week-about model and assumed that adults would be educated along with typical high school age students, bringing capacity to 950 students.

SECTOR TYPE

Education, State Government

LOCATION

Lincoln, Rhode Island

PROJECT SIZE

220,000 square feet

FINANCIAL OVERVIEW

Project Cost \$582,000

SOLUTIONS

The school partnered with its utility, National Grid, to design a project to upgrade the existing lighting systems to the newest, most energy efficient fixtures throughout the facility. Targeted areas included: classrooms, computer labs, workshops, library, gymnasium, locker rooms, offices, bathrooms, storage rooms, cafeteria, hallways, stairwells and the exterior of the facility. T-12 and metal halide lighting was upgraded to Super T-8 and LED lighting throughout the building and exterior.

In addition to the lighting improvements, additional control points were added to the existing energy management system. New CO2 sensors and demand control ventilation sequences for 10 unit ventilators and two rooftop air handling units were installed. This measure included the installation of wall mounted CO2 sensors in 10 classrooms, machine shop, and auditorium return air ducts. It also included the programming of the controls to execute the demand control ventilation sequences and the alternation of the graphics to show the CO2 levels in the rooms. The approximate natural gas and electric savings are 156 therms and 7,396 kWh.

The project also included the installation of two new fan motors and matching variable speed drives (VSD's) to control the auditorium rooftop unit fans. The new VSD's will allow for the fans to be slowed to a minimum speed when heating, cooling or ventilation is not needed in the auditorium. Ventilation will be controlled using CO2 sensors installed in the return air duct. The estimated electric savings for this project is 15,210 kWh.

OTHER BENEFITS

These upgrades have enhanced the quality of the lighting, ventilation and safety throughout the school, creating a healthier learning environment for students. In addition, almost 50% of the project cost was covered through National Grid incentives. Davies was the first State facility to take advantage of National Grid's On-Bill Repayment program, in which the remaining customer cost after incentives can be paid over a 2-5 year time period through their utility bill.

Annual Energy Use

(Source EUI)

Baseline(2013)
140 kBtu/sq. ft.

Expected(2018)
86 kBtu/sq. ft.

Actual()
Coming soon

Energy Savings

39%

Annual Energy Cost

Baseline(2013)
\$303,000

Expected(2018)
\$156,000

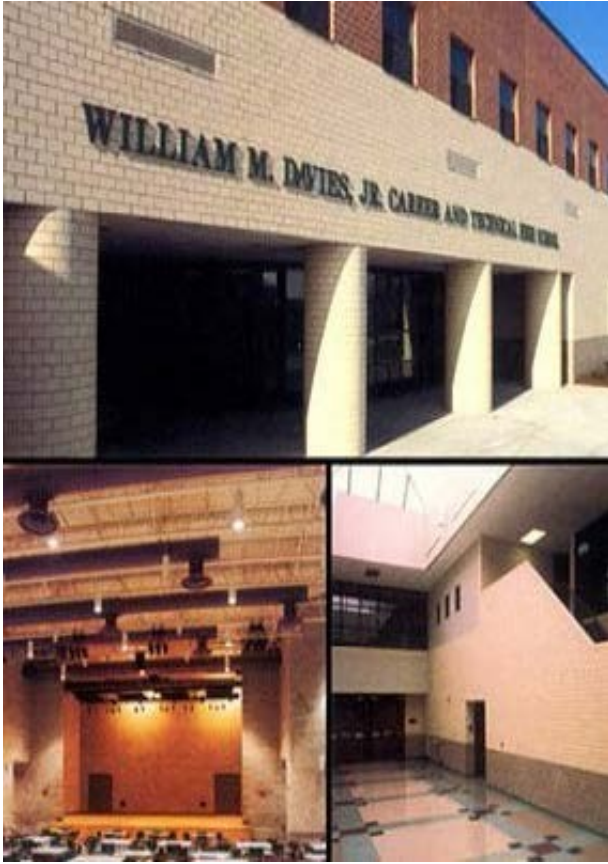
Actual()
Coming soon

Cost Savings

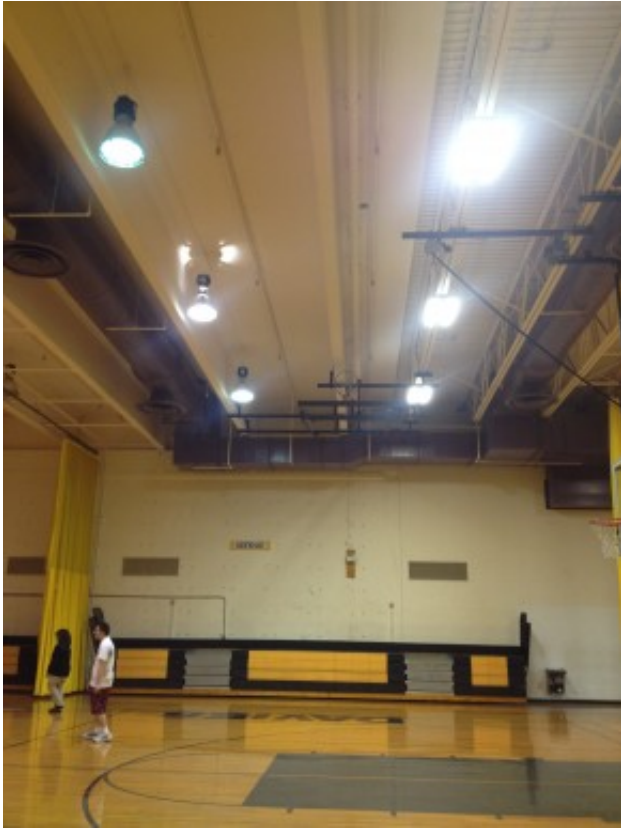
\$147,000



Davies High School cafeteria



Davies Career and Technical High School



Davies High School gymnasium