



SHOWCASE PROJECT: PARKWAY SCHOOL DISTRICT: PARKWAY WEST HIGH SCHOOL

SOLUTION OVERVIEW

Parkway West High School is one of five high schools within the Parkway School District and has a student population of approximately 1,260. The school conducted a retro-commissioning study due to its low building energy performance and occupant discomfort that produced suggested performance and indoor quality upgrades. After building improvements, the project achieved an annual energy savings of 27 percent and an annual cost savings of \$98,600.

The district portfolio includes 28 K-12 schools and serves approximately 17,300 students within the western suburbs of St. Louis, Missouri. The district has two dedicated early-childhood education facilities and four additional support buildings. Parkway West High School was constructed in 1967, comprising 317,000 square feet of space that includes three gymnasiums, a swimming pool, an auditorium, cooking facilities, and outdoor athletic fields.

The school's last major HVAC upgrade was completed in 1999 using an energy savings performance contract.

SECTOR TYPE

Education

LOCATION

Chesterfield, Missouri

PROJECT SIZE

317,000 Square Feet

FINANCIAL OVERVIEW

\$127,000

SOLUTIONS

The district worked with the school to select a vendor, conduct a detailed retro-commissioning study, apply for utility incentives, and implement adjustments to the building's air handling units, water valves, and controls.

Below is a chart of a number of the implemented measures along with associated costs and annual energy savings achieved.

Savings Measure	Cost	Savings Achieved	Details
Supply air temperature reset control (from 50F to 55F-60F)	\$12,886	162,460 kWh	Resetting air handling unit discharge air temperatures upward when conditions allow, reduces cooling and reheat energy required
Duct static reset (4 fans, 4,627kWh each; decrease static pressure 0.5", flow by 25%, HP by 1.83)	\$1,920	18,508 kWh	Adjust static pressure of variable air volume boxes (VAV) based on air flow across zones
Economizer optimization (4 air handling units, 3 rooftop units)	\$13,170	117,290 kWh	Increase outside air into the air handling unit when enthalpy is lower than return air enthalpy
CO ₂ controls 2 air handling units; 1 rooftop unit	\$8,039	68,267 kWh	Balance minimum outside air set points with required ventilation
3-way chilled water valves, balancing of chilled water system	\$29,592	58,796 kWh	Improve valve functioning to enable variable flow drives (VFDs) on the pumps to meet system pressure set points
Hot water control balancing	\$4,841	19,648 kWh	Replace differential pressure sensor to adjust system flow, thereby reducing pump speed

OTHER BENEFITS

Parkway secured a utility rebate totaling \$39,200, reducing the overall project cost to the district by 30 percent. In addition, the district implemented a number of HVAC maintenance improvements such as removing inlet guide vanes and installing new inverter duty motors and associated VFDs, among other measures. These measures are expected to improve the overall performance of the building and increase comfort while yielding a small amount of energy savings.

Annual Energy Use

(Source EUI)

Baseline(2015)
 173 kBtu/sq.ft.

Actual(2019)
 126 kBtu/sq.ft.

Energy Savings

27%

Annual Energy Cost

Baseline(2015)
 \$419,800

Actual(2019)
 \$321,200

Cost Savings

\$98,600



Entrance to Parkway West High School