



SHOWCASE PROJECT: ARLINGTON COUNTY EQUIPMENT BUREAU

SOLUTION OVERVIEW

Built in 1983, Arlington County's Equipment Bureau manages and maintains the county's fleet of 1,200 vehicles. The full-service vehicle maintenance and repair facility includes an extensive compressed air system and hydraulic lifts, with 28 vehicle maintenance bays, storage, and office space. The facility is energy intensive, operating at least 18 hours per day, and spanning 52,800 square feet in total. The variety of vehicles and heavy equipment maintained and repaired at this facility include snowplows, dump trucks, street sweepers, police vehicles, and fire and rescue apparatus; it serves the needs of the entire county.

SECTOR TYPE

Local Government

LOCATION

Arlington, Virginia

PROJECT SIZE

52,800 square feet

FINANCIAL OVERVIEW

Project Cost: \$720,000

SOLUTIONS

The project cost \$720,000, with an estimated incremental cost of \$50,000 over what would have been incurred without the energy efficiency measures. Arlington County implemented a number of high-priority measures including the HVAC system, lighting, and controls. With an HVAC system at the end of its life expectancy, the decision to replace the old equipment with an energy efficient Variable Refrigerant Volume (VRV) system was consistent with county energy practices as outlined in the [County Operations Energy Plan](#) (COEP). Specifically, the COEP identifies a county objective to increase facility and infrastructure energy productivity through continuous improvements in energy efficiency, and to be a leader in early adoption and promotion of innovative technology. The more efficient HVAC system also helps the county meet its Better Buildings Challenge goal to reduce energy use 20 percent by 2022. The HVAC system for the office area cost \$680,000, an estimated \$10,000 more than the cost of replacing the end-of-life system with a similar less efficient system.

After the HVAC and lighting replacement, a lighting control system was installed to schedule and dim LED lighting in the 2nd floor office space. This opportunity arose from an on-going relationship between the County and researchers at Virginia Tech. LED lights, which replaced all of the previous fluorescent fixtures, cost \$35,000. The lighting control system cost \$5,000.

Savings Measure	Cost	Notes
HVAC system	\$680,000*	The existing system, at the end of its useful life, was replaced with a Variable Refrigerant Volume (VRV) system. The VRV system can provide simultaneous heating and cooling to different zones. A dedicated outdoor air unit uses a plate heat exchanger for energy recovery and reduces the ductwork needed to provide fresh air for a healthy work environment.
LED lights	\$35,000	Ceiling lights in the office were upgraded to LEDs. Previously, the county had replaced outdoor lighting at the facility with LEDs, also providing significant savings.
BEMOSS lighting controls	\$5,000	Using Building Energy Monitoring Source Software (BEMOSS) from Virginia Tech project funded by the Department of Energy Building Technologies, Arlington added scheduling and dimming capabilities to the office lighting. This software allows lights to be scheduled and dimmed in different spaces through an online portal. The portal also provides historical data and tracks energy use of the building. This system helps small businesses gain more control over HVAC and lighting systems when a traditional automation system might be expensive.

OTHER BENEFITS

Beyond the energy components of this project, upgrades to two equipment bays give the county the capability to maintain Compressed Natural Gas (CNG) vehicles.

To ensure worker comfort and safety, the renovation improved air quality with additional fresh ventilation, while improving insulation and air sealing between the shop environment and administrative offices. Occupant comfort also improved by way of individual zones for HVAC, eliminating the need for space heaters. The roof top units allow for a more efficient and less noisy operation, diminishing complaints from neighbors. The BEMOSS system allows lights to be dimmed in zones throughout the office, meeting the needs of each individual space at different times of operation.

Annual Energy Use

Baseline(2014)
138 kBtu/sq.ft.

Actual(2016)
91 kBtu/sq.ft.

Energy Savings

34%

Annual Energy Cost

Baseline(2014)
\$87,000

Actual(2016)
\$65,000

Cost Savings

\$22,000



Equipment Bureau, Rooftop Units



Equipment Bureau, Entrance