



RETAIL CASE STUDY

MCDONALDS RESTAURANT— ENERGY UPGRADE



Existing Condition

The existing mechanical systems were standard McDonalds specifications which controlled building pressures with use of economizers in the RTU's. There is substantial fixed speed exhaust to mitigate however while trying to maintain comfort.

All controls were centrally located in the office for the RTU's and were routinely overridden by managers to

Central Wireless Automation System was Added to the Existing Mechanicals

Four RTU's ranging from 6-12.5 tons were integrated into a central wireless control system to manage temperatures remotely and standardize set-points. This took local control away from the employees and set the stores to corporate standards. All schedules were also standardized to not allow overrides and



Each zone is now easily monitored and controlled remotely.

Economizer Advanced Controls Added

All economizers were taken over with new controls that maximize use of OA while not over ventilating. DCV (demand control ventilation) utilizes sensors to read CO2 in the air and add OA when needed to maintain proper air quality. The same system is used to prevent unneeded ventilation when the temps

Kitchen System Modified to Maximize Air Make-up

The kitchen unit previously was set to 68F during summer and winter which ended up using mechanical cooling 365- 24/7 since the area could not meet 68F due to the heat generated in the area. After testing the system we re-set the area settings to 76F and integrated a OA mechanical cooling cut-off to 50F to prevent mechanical cooling and utilize OA to fully ventilate as much as possible. This cut 12.5



Storage area set to different schedule and settings than the dining room

Electrical Saving on Building Automation— 20 hr/day Average Store

Unit	Yearly Saving	Cost Saving
Kwh	90,080	\$ 8,799.00
Maintenance	40%	\$ 5,032

10 yr Savings \$ 94,155.93

Note: Savings based on 3% cost increase per year

Electric Window Heat Controlled with Same System

Window ceiling electric booster heat were operating uncontrolled and were routinely set to 85F. We found these system operating while the mechanical cooling was also operating in the kitchens. The thermostat was also not on a schedule so it was also running all night when they were closed. Tower added a control relay to the new control system and set the temperature to operate only when needed.



Uncontrolled electric heat now part of the automation



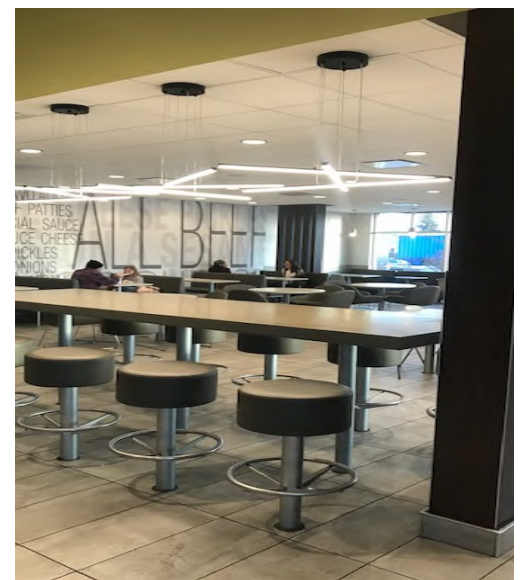
Kitchen area uses the RTU for MUA. Automation can control the building as a whole and balance the negative air

Actual ROI

112%

Reduced Service Calls

The remote real time data on how each RTU is operating gives better perspective on equipment operation and eliminates 40% of service calls by average. Data is compiled in real time and can spot operational problems early to prevent emergency failures.



Store lighting was aging and inefficient . The old system was removed and replaced with an efficient LED system that can be cleaned easily and has no hazardous components for maintenance.