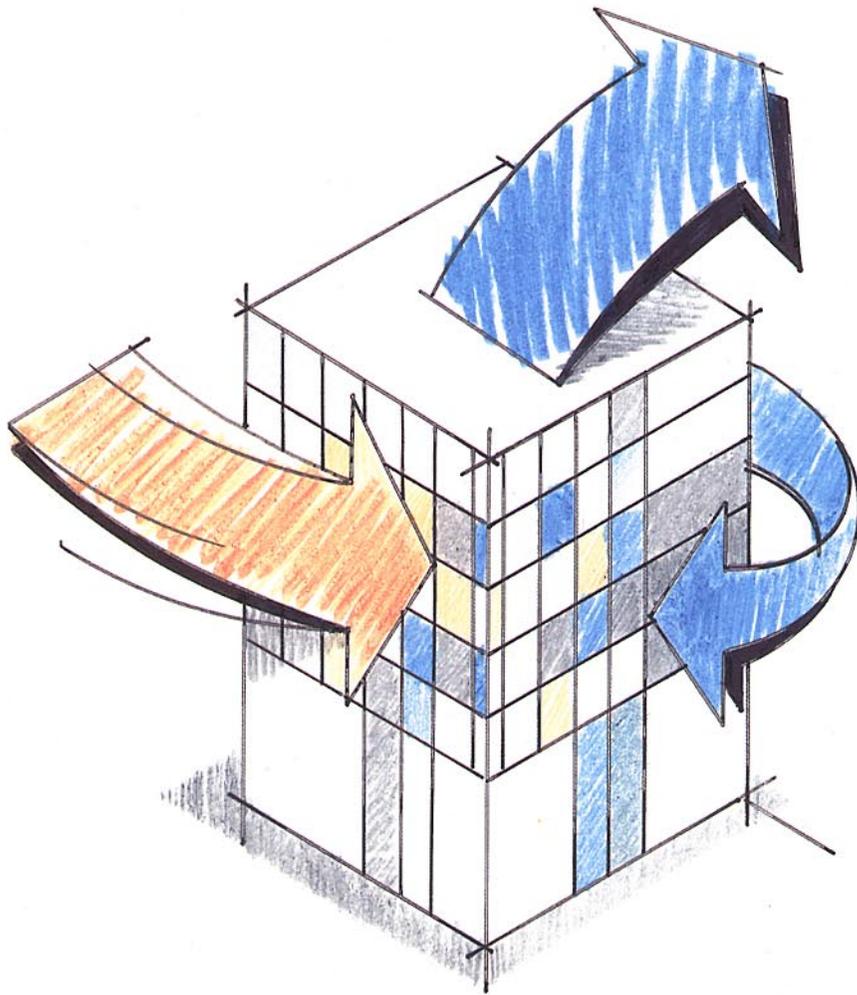


Making
the Old
Work
like New.



Tuned Up for Success

Building Tune-Up Demonstration Project

A **B**J's Wholesale Club Best Practice:

Hire an energy manager to track and reduce facility energy costs.

BJ's Wholesale Club is a single-story building built in 1992. It is approximately 100,000 square feet and is located in Auburn, Massachusetts. Cooling is provided by packaged rooftop units, and a propane furnace provides heating.

Tune-Up Examples

Automatic Electric Defrost Cycle. The defrost schedule for frozen food was improved to reduce coincident defrost cycles.

Enthalpy Control. The enthalpy economizing controls were not set to the most appropriate value for the region. The setting was changed and additional free cooling was obtained.

Rooftop A/C Schedules. Rooftop unit schedules were modified to prevent unnecessary operation during unoccupied hours.

Battery Charging Schedules. The forklift charging schedules were changed to off-peak times to reduce peak energy use charges

The Costs and Savings

Gather and review documentation	\$1,180
Develop assessment plan	600
Site assessment & follow-up	1,910
Diagnostic monitoring	3,590
Analyze data	1,800
Develop recommendations	600
Implement recommendations (labor and parts)	3,200

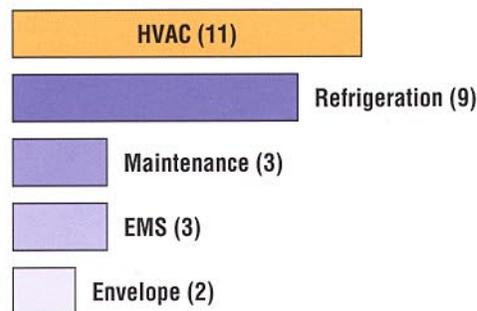
Total Cost: \$12,880

Total Savings*: \$ 8,042

Simple Payback: 19 Months

*expected savings were obtained using engineering calculations and building simulation software

Findings by Category



*Facility Operation
& Maintenance
Energy Management*

BJ's Wholesale Club, Auburn, MA
Tuned Up for Success

Building Tune-Up Demonstration Project

Building Tune-Up Demonstration Project

Commercial and retail facilities can capture significant energy savings opportunities through low-cost improvements in O&M procedures.

The Tune-Up Process

- Review available building documentation.
- Develop a building-specific tune-up plan.
- Perform an on-site survey of the present O&M practices.
- Perform two weeks of diagnostic monitoring.
- Develop recommendations for the most cost-effective improvements.
- Perform post-improvement monitoring.

Five facilities participated in the U.S. EPA and U.S. DOE's Building Tune-Up Demonstration Project.

- Columbia Square
Portland, Oregon
- Citizens Plaza
Nashville, Tennessee
- BJ's Wholesale Club
Auburn, Massachusetts
- J.C. Penney
South Glenn, Colorado
- Parkway Fountains
Phoenix, Arizona



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Building Tune-Up Demonstration Project

A Parkway Fountains Best Practice:

Hire a property management firm with a broad understanding of facility operation, maintenance, and energy management. In addition, provide quality training for facility staff.

Tune-Up Examples

Improved Lighting Schedule. Lobby, corridor, and lobby plant lighting were turned off during unoccupied hours using the existing mechanical time clock, which had been disengaged by the previous owner.

Improved HVAC Equipment Schedules. The improvement added a time clock function to the existing control panels for loop pumps, cooling tower, outside air fans, and hydronic heat pumps. This equipment had previously run continuously.

Improved Parking Garage Exhaust Fan Schedule. The existing time clock was replaced with a seven-day clock to schedule fans OFF during the weekends.

The Costs and Savings

Gather and review documentation	\$1,030
Develop assessment plan	600
Site assessment & follow-up	1,630
Diagnostic monitoring	3,590
Analyze data	1,500
Develop recommendations	600
Implement recommendations (labor and parts)	5,600

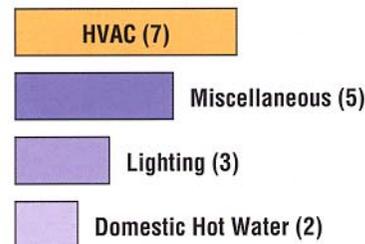
Total Cost: \$14,550

Total Savings*: \$16,194

Simple Payback: 11 Months

*expected savings were obtained using engineering calculations and building simulation software

Findings by Category



Parkway Fountains is a four-story building built in 1986. It is approximately 80,000 square feet and located in Phoenix, Arizona. Heating and cooling are provided by 95 water-source heat pumps located throughout the building.

Parkway Fountains, Phoenix, AZ

Tuned Up for Success

Building Tune-Up Demonstration Project

A Citizens Plaza Best Practice:

Use a computerized maintenance management system to enhance staff responsiveness to tenant complaints, document maintenance problems over time, and reduce maintenance costs.

Tune-Up Examples

Chilled Water Pump VFD Operation. Faulty logic in the variable frequency drive for the pump was corrected.

Heating Water Pump Lockout. The heating water pump was running when not needed; it now provides hot water only during more appropriate outside air conditions.

EMS Documentation and Training. The EMS had inadequate parameter block documentation and explanation. The controls contractor added notations and trained the building staff on EMS operation.

The Costs and Savings

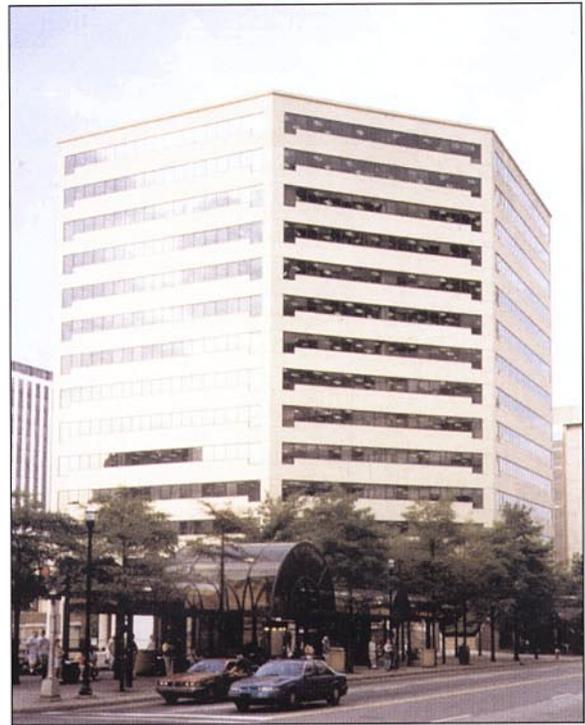
Gather and review documentation	\$1,260
Develop assessment plan	600
Site assessment & follow-up	3,580
Diagnostic monitoring	5,520
Analyze data	2,830
Develop recommendations	880
Implement recommendations (labor and parts)	9,300

Total Cost: \$23,970

Total Savings*: \$42,290

Simple Payback: Less Than 7 Months

*expected savings were obtained using engineering calculations and building simulation software



Citizen's Plaza is a 15-story building built in 1985 and owned and occupied by the State of Tennessee. It is approximately 250,000 square feet and located in Knoxville, Tennessee. Space conditioning is provided by district steam chilled water produced off-site, with supplementary electric perimeter reheat.

Findings by Category

Equip. Control Parameters (11)

Scheduling & Bldg. Control (7)

Documentation (5)

Maintenance (5)

Training & Mgt. (4)

Citizens Plaza, Nashville, TN

Tuned Up for Success

Building Tune-Up Demonstration Project

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Use a computerized maintenance management system to enhance staff responsiveness to tenant complaints, document maintenance problems over time, and reduce maintenance costs.

Tune-Up Examples

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The Costs and Savings

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Site assessment & follow-up	3,580
Diagnostic monitoring	5,520
Analyze data	2,830
Develop recommendations	880
Implement recommendations (labor and parts)	9,300

Total Cost: \$23,970

Total Savings*: \$42,290

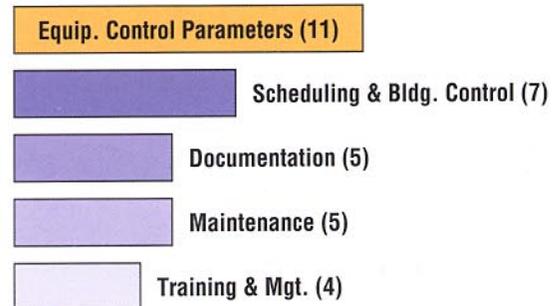
Simple Payback: Less Than 7 Months

*expected savings were obtained using engineering calculations and building simulation software



Citizen's Plaza is a 15-story building built in 1985 and owned and occupied by the State of Tennessee. It is approximately 250,000 square feet and located in Knoxville, Tennessee. Space conditioning is provided by district steam chilled water produced off-site, with supplementary electric perimeter reheat.

Findings by Category



Citizens Plaza, Nashville, TN

Tuned Up for Success

Building Tune-Up Demonstration Project

A J.C. Penney Best Practice:

Use an operations and maintenance expense accounting program to track and compare energy and O&M expenditures over time.

The South Glenn J.C. Penney store is a two-story building built in 1973 and renovated in 1987. It is approximately 120,000 square feet and located in South Glenn, Colorado. Heating and cooling are provided by two gas boilers and two water-cooled chillers.

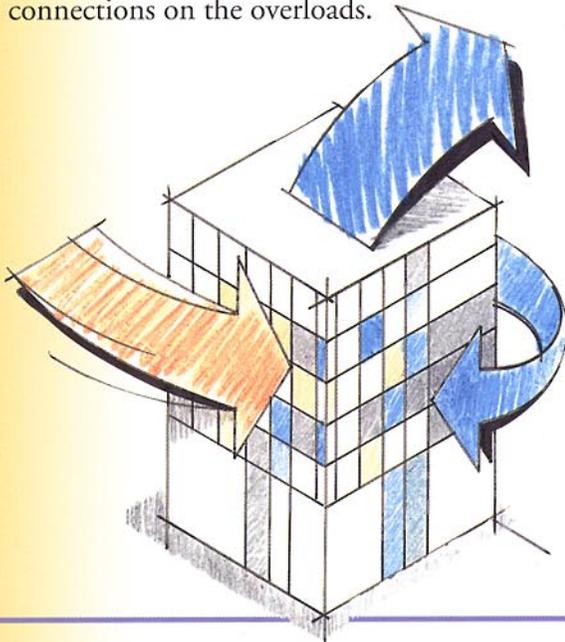
Tune-Up Examples

Optimize Night Purge Control Sequences.

Reduce Outside Air Fraction. The amount of outside air could be reduced and still meet minimum requirements.

Disable Return Fans on Oversized System. The return fans were disabled, saving energy and producing no negative effects.

Cooling Tower Fan Malfunction. The fan was repaired by tightening the wire connections on the overloads.



The Costs and Savings

Gather and review documentation	\$ 740
Develop assessment plan	600
Site assessment & follow-up	1,620
Diagnostic monitoring	4,070
Analyze data	1,270
Develop recommendations	600
Implement recommendations (labor and parts)	2,410

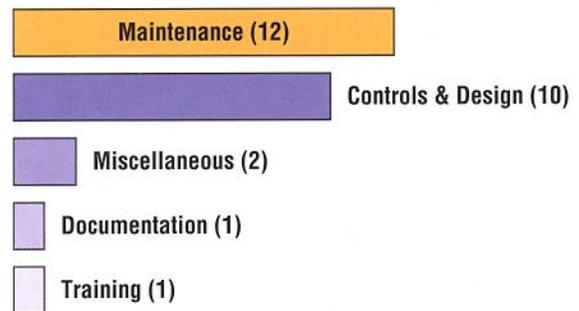
Total Cost: \$11,310

Total Savings*: \$14,110

Simple Payback: Less Than 10 Months

*expected savings were obtained using engineering calculations and building simulation software

Findings by Category



J.C. Penney, South Glenn, CO

Tuned Up for Success

Building Tune-Up Demonstration Project

Building Tune-Up Resources

The O&M Best Practices Series. Six booklets of strategies to improve building performance and save money by enhancing building operation practices. Available on-line at www.peci.org and www.epa.gov/buildings. Hard copies available (charges apply) by calling PECEI at 503/248-4636.

A Practical Guide for Commissioning Existing Buildings, published by Oak Ridge National Laboratory, May 1999. Available through NTIS at www.ntis.gov. Request ORNL Document Number ORNL/TM-1999/34.

The Energy Star* Building Label website at www.epa.gov/buildings.



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