SEATTLE
building
tune-ups

CASE STUDY SEATTLE JUSTICE CENTER

In the heart of downtown, Seattle Justice Center is a classically modern building dedicated to civic discourse. Built in 2002, the 298,278 SF building houses the city's courts and police headquarters.

An expansive southwest-facing glass wall illuminates the building's 13 stories and creates a dynamic architectural feature from a double skin "glazed thermal buffer"—designed to reduce heat gain in the summer and allow for heat retention in the winter. The building has a basic HVAC system with a VAV system with hot water heating at thermal units. Upon review of the systems and the current space uses, it was found that many air handlers serve a mix of spaces that are occupied only during one shift, as well as spaces that are occupied 24 hours a day, 365 days per year, resulting in significant conditioning of un-occupied spaces. One air handler and supply system were constant volume as designed.

By undertaking a systematic assessment of the building, the building operations team and the Tune-Up Specialist team collaborated on a suite of improvements that included required Tune-Up actions, as well as several investments that went above and beyond the mandate.

Building Tune-Ups is one of Seattle's many leading-edge energy efficiency policies, and to pave the way, the largest municipal buildings are required to comply with the mandate one year ahead of the private market.

Photo by Erik Stuhaug

SEATTLE JUSTICE CENTER
298,278 SF

	COSTS		PROJECTED SAVINGS	
ASSESSMENT	$50,000	$0.17/SF		
REQUIRED TUNE-UP ACTIONS	$44,000	$0.15/SF	$35,000	$0.12/SF
GOING ABOVE + BEYOND	$71,500	$0.24/SF	$57,000	$0.19/SF
TOTAL	**$165,500**	**$0.55/SF**	**$92,000 PER YEAR**	

SPOTLIGHT ON SAVINGS

Investing $50,000 in a deep assessment and implementing required Tune-Up actions at the cost of $44,000 will yield $35,000 in annual savings. By identifying voluntary actions with a high return on investment, the team invested another $71,500 on upgrades that will result in $57,000 in annual savings!

Combined, this Tune-Up offers a simple payback of 1.8 years.

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Seattle
Office of Sustainability
& Environment

Photo by Christian Richters

FINDINGS + FIXES REVEALED

After assessing building systems and operations, analyzing benchmarking data, and reviewing water bills, the team identified required operational and maintenance improvements and corrective actions to comply with the mandate. Required fixes included several key measures below:

- **Air handler units:** recommissioning most units; functional testing and correcting economizers; implementing supply air temperature reset and supply duct static pressure reset; and control damper maintenance.
- **Scheduling:** aligning building schedules with occupancy in all spaces; modifying building static control; and use of single thermostat signal where multiple units served a common area.
- **Variable air volume systems:** box flow minimum and maximum reduced to ASHRAE-recommended levels.

Projected energy savings for the required fixes are 286,000 kWh/year and 16,923 therms/year, and projected utility savings are $35,000/year.

GOING ABOVE AND BEYOND

In addition to the required corrective actions, the team seized on the opportunity to think about the building's energy holistically and identified a suite of voluntary actions that are proving to be a sound return on investment.

- One strategy minimized unnecessary conditioning by reconfiguring night zoning to better align with occupancies and enabling/adding demand-controlled ventilation on all air handler units. **Projected energy savings are 5,000 kWh/year and 8,000 therms/year, and projected utility savings are $8,000/year.**
- Another highly cost-effective add-on with a short payback was adding variable frequency drives and new motors to the building's exhaust fans. Operating power of two central exhaust fans was reduced from 45 horse power (HP) to 5.5 HP during the day and 1 HP at night. **Projected energy savings are 280,000 kWh/year and 10,000 therms/year, and projected utility savings are $27,500/year.**
- Variable air volume controls were added to one constant volume air handler. **Projected energy savings are 250,000 kWh/year and 6,000 therms/year, and projected utility savings are $21,000/year.**

MEET THE TUNE-UP SPECIALIST TEAM

Morgan Heater + Gia Mugford, Ecotope • Wes Hoppler, Seattle Citywide Resource Conservation Advisor • Evan Cobb, Seattle Finance and Administrative Services (FAS) Resource Conservation Advisor • John Sheldon, FAS Facilities Manager • Adam Peterson, FAS HVAC Lead • Terry Bacon, FAS Controls Technician

Seattle Building Tune-Ups is a progressive energy efficiency policy that helps building owners identify smart, responsive ways to reduce energy and water costs.

SEATTLE building tune-ups

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