Carilion Roanoke Memorial Hospital
Trane High Performance Building solution provides $250,000+ savings/year • Roanoke, VA

Carilion Roanoke Memorial Hospital (CRMH) knew that it had no control over utility rates, but that it did have control over its energy use. The hospital sought to identify and implement energy conservation measures (ECMs) to reduce costs, in alignment with its mission to provide quality patient care as efficiently as possible.

Challenge
CRMH set out to identify low cost energy conservation measures (ECMs) that could be implemented to reduce its energy use and carbon footprint, lower costs for patients and provide a positive return on their investment. Due to increasing demands, hospital staff were unable to focus on the impact of their actions on energy use, the environment and the bottom line.

Solution
Based on a relationship that spanned over twenty years, Trane had extensive knowledge of CRMH operations, business goals and infrastructure needs. CRMH and the Trane high performance building team developed a partnership to address the energy and operational objectives of the hospital, utilizing an annual performance-based service agreement.

Identifying potential savings
Trane initiated a process to identify and quantify potential improvements. The ECM process is based on Six Sigma methodology, which takes critical factors such as saving potential, practicality, commercial viability and risk management into consideration.

Energy consumption was benchmarked, plans were developed and ECMs were identified. Trane and CRMH evaluated the ECMs and developed a top project list. Over twenty-five ECMs were implemented including chilled water plant flow issue minimization, chiller plant automation, controls programming and flat plate heat exchanger modifications.

Automation to improve operational performance
To maximize energy savings, Trane TR200™ Series variable frequency drive controls were installed for the air-handling unit and chilled water pump. The controls offer custom-programming flexibility to address a wide range of requirements to improve air quality and assist in keeping patients and staff comfortable. The controls allow seamless communication with the Trane Tracer Summit® building automation system (BAS). Supported by Trane Tracer ES™ software, the BAS allows the hospital to complete daily tasks, such as troubleshooting, scheduling and alarm management.
Tracking and monitoring for sustainability

Costs, energy savings and carbon footprint reductions are tracked locally. Trane active monitoring provides operational tracking to sustain implemented ECMs. Monthly reports are reviewed by a Trane high performance building specialist and forwarded to CRMH with any concerns. Continuous performance monitoring allows CRMH to identify potential equipment upgrades or replacement needs.

Systems and services

- Trane Building Services
- Trane TR200 Series variable frequency drive controls
- Trane Tracer Summit building automation system
- Trane Tracer ES software
- Trane active monitoring

Results

The partnership of CRMH and the Trane high performance building team has resulted in significant energy and operating savings and carbon footprint reductions. Specific results and annual savings include:

- Over twenty-five ECMs approved and implemented
- $273,778 energy savings in the first year
- CO2 reduced by 2,214 tons
- Carbon emissions reduced by 547,727 kg CO2/Kwh

Improved decision making

Tracking and data analysis have enabled more intuitive decisions regarding ECMs and operational improvements. "I've been in the energy conservation area for many years," stated Johnny Morris, senior director of engineering, Carilion Clinic. "Over the years, we haven't always made the best decisions because we didn't think it through. We have a much more thorough thought process now."

Increasing awareness increases results

Trane provides ongoing training for CRMH staff on various HVAC troubleshooting techniques and the functions of the Tracer Summit building automation system. The training helps quantify staff impact on energy use and the energy penalties caused by malfunctioning equipment. It also fosters teamwork, as CRMH and Trane work together to identify potential energy saving opportunities. "We have a good relationship with Trane," said Morris. "Their enthusiasm carries over to our people and vice versa. We have general staff wanting to help in any way they can from recycling to looking for new ways to conserve energy."

Identifying energy conservation measures is an ongoing project for CRMH. "You can make a huge difference with energy conservation. For every dollar saved, that’s money you can put back into your operation to give people a good place to go for their healthcare," said Morris. "Plus, it's fun to be able to take a piece of equipment and make it work better. Why would you not do it?"

CRMH is a teaching hospital and features the region’s only Level I trauma center.