

Case study

Houghton-Portage Township Schools

Houghton, Michigan



School district, community embrace vision to teach for tomorrow

Houghton-Portage Township School District is committed to excellence. From its curriculum and instruction to its facilities, the district strives to provide an exceptional learning environment for all students, both now and in the future. Maintaining this focus, the district teamed with Johnson Controls to leverage community support through a bond referendum, coupled with a performance contract, resulting in facility and technology upgrades, building expansion, and operational cost savings of more than \$3 million.

With a high school ranked as one of the best in the nation by U.S. News and World Report, the district is known for academic leadership. Its mission is to provide a balanced curriculum and quality programs that enhance the learning experience. In order to ensure its students have the tools they need today for a successful tomorrow, the district wished to address the growing need for new technologies, facility improvements and larger physical education and music facilities.

The district also wished to increase the overall energy efficiency of its three schools and was considering performance contracting as a means to accomplish this, and make the desired facility improvements. While an energy audit indicated significant savings were available to the district, they would not be enough to offset the cost of the desired improvements under a traditional performance contract.



The bond included upgrades to classroom and lab computers, monitors, printers and projectors.

“Our goal with both the upgrades to existing facilities and this new construction is to do everything we can to provide the academic environment for students and teachers that the community expects. Johnson Controls is helping us achieve that.”

BILL POLKINGHORNE
SUPERINTENDENT
HOUGHTON-PORTAGE
TOWNSHIP SCHOOLS



An integrated IP surveillance system involves cameras located throughout the district.

“We met with Johnson Controls. They listened to us, understood our needs, and proposed a performance contract within a bond referendum, which would enable us to accomplish what we wanted to do. And, if the bond should fail, the proposal included a parallel plan to leverage energy saving opportunities under a performance contract to meet our immediate needs,” says Bill Polkinghorne, superintendent for the district. “In addition, the proposal included helping us market the plan to our community to bring them on board and pass the bond,” adds Randy Ricchi, business manager for the district.

Leveraging community support broadens scope of improvements

The project marks the first time a performance contract was implemented inside of a voted bond referendum in the State of Michigan. This approach allowed over \$12 million dollars of improvements to the district’s schools, while delivering 100 percent of the \$3 million in energy savings guaranteed under the performance contract back to the district’s general fund for use in operating the facilities. “As a board, we had looked at the bigger picture and wanted to do more than just energy upgrades, but were concerned about not having the necessary operating funds,” says Dr. Brad Baltensperger, board member. “The Johnson Controls approach provided a comprehensive package instead of requiring us to pick and choose the upgrades we could do. This ultimately made it easier for the board to buy in to the project and to sell it to the community.”

To garner community support, Johnson Controls partnered with Polkinghorne and the school board in a public relations campaign designed to communicate the project’s impact on technology, academic and instructional needs, and energy efficiency. The “teaching for tomorrow” campaign included town hall meetings, news releases and letters, an online communications platform, radio program and other initiatives. With the help of architect and engineering firm, Integrated Design Inc., and construction manager, Gundlach Champion, Johnson Controls gathered supporting materials and submitted the bond application.

Once the bond passed, retrofits and upgrades for existing facilities began immediately. Under the performance contracting model, Johnson Controls was able to put firm, engineered pricing into the bond referendum alleviating the need to finalize costs after the community passed the bond. “This process not only saved us money because we were able to make decisions early in the process and were working with fixed costs, but it also saved a lot of time,” says Phillip Foltz, board member.

Improving technologies, securing learning environments

For the district, proficient use of technology is an essential skill students need to be successful in today’s workplace. The bond included upgrades to classroom and lab computers, monitors, printers and projectors. Johnson Controls installed a wireless network that provides complete wireless coverage throughout the district. The

network allows students, teachers and guests to use laptops in non-traditional areas and provides Internet access to visitors without impacting the district's network.

To replace an old analog phone system, Johnson Controls deployed a Cisco Unified Communications Manager (VoIP) system by leveraging the existing cabling infrastructure, reducing first costs – and saving \$10,000 annually in communications costs. The system operates even if the network between the buildings fails. Information Protocol (IP)-based speakers, clocks and a bell system use the same cabling and replace two disparate paging and clock systems, providing a single system for overhead paging, synchronized clocks and bells on the same network. The system greatly improves the district's capability for emergency response inside the classroom and provides greater flexibility with text messaging and classroom-by-classroom communication. End-of-life hubs and switches were also replaced with gigabit switches, improving network and Internet speed by nearly 100 times.

"With the presence of Michigan Technological University in Houghton, expectations are high for our district to maintain a parallel course. The project allowed us to address antiquated technologies and failing computers in order to meet those expectations," says Polkinghorne. "The end result is improved instructional delivery in the classroom, which is in keeping with our reputation for academic leadership," adds Baltensperger.

The district also wished to increase the safety and security of students, faculty and staff. The project included installation of the Johnson Controls

P2000 security management system at all three schools. Identification cards are required for access at select doors. Sensors on remaining doors enable the system to monitor them and notify personnel if a door is used or left open. An integrated IP camera surveillance system involving 26 cameras throughout the district shares the same Ethernet cabling and can be viewed from multiple locations and the Internet. "Each principal has access to those camera views on a monitor in their office, which has been a huge help in maintaining security and has received accolades from our student council," notes Polkinghorne.

Energy efficiency upgrades provide operational savings/funds

An energy audit revealed numerous ways the district could improve energy efficiency. Improvements made by Johnson Controls include lighting retrofits and water conservation measures, including new toilets, urinals and low-flow fixtures at all three schools. Other improvements include replacement of select boilers and thermostats, installation of variable frequency drives, occupancy and CO₂ sensors and other HVAC equipment, use of VendingMisers, and a new chemical pool cover at the high school. All lighting and HVAC equipment and controls are monitored and controlled by a new Johnson Controls Metasys® building management system.



Superintendent Bill Polkinghorne (pictured) and the school principals have access to the integrated IP surveillance system camera views from monitors in their offices.

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**PHILLIP FOLTZ
BOARD OF EDUCATION
HOUGHTON-PORTAGE
TOWNSHIP SCHOOLS**



Lighting retrofits and other energy efficient upgrades at all three schools improve the academic environment and provide savings.

Technologies and Services

- Johnson Controls Metasys® building management system
- Johnson Controls P2000 security management system
- Notifier fire alarm system
- Internet Protocol cameras and surveillance system
- Cisco Unified Communications using VoIP with Survivability
- Informacast IP speakers, clocks and bell system
- HP Procurve network switches
- Wireless network for laptop computers

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DR. BRAD BALTENSPERGER
BOARD OF EDUCATION
HOUGHTON-PORTAGE
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A second gymnasium and music room are being built to augment facilities currently shared by the middle and high schools.

Aging windows at the middle and high schools were replaced and roof repairs or partial replacements were done at all three schools. The energy efficiency upgrades are expected to bring the district savings of 30 percent, nearly \$110,000 annually over the 20-year contract. Because the upgrades are funded by the community, these savings can be used to operate district facilities rather than repay debt. "The benefit of these upgrades goes beyond the savings to one of the key drivers behind this project. And that is the improvements they bring to the academic environment like proper lighting, comfort and technologies that allow the learning to take place," says Foltz.

Under a five-year planned service agreement, Johnson Controls maintains the Metasys system and HVAC equipment and provides measurement and verification services to ensure savings are realized. Training of district personnel is also provided to help them optimize the equipment and controls that have been put in place. "We expect this training, along with the new equipment will help us reduce maintenance costs over the long term," notes Ricchi.

Expansion to bring district, community together

Working closely with the architects, engineers, and construction manager, Johnson Controls served as the technology contractor for the design of all low voltage systems for the district's new gymnasium and music room, slated for completion in the fall of 2010. Starting with the end in mind, Johnson

Controls designs included the same technologies and equipment used in retrofitting the existing facilities, to reduce first costs and ensure compatibility. All systems will be integrated with the existing Metasys system.

With more than 750 middle and high school students sharing a single gymnasium for physical education and extra-curricular needs, the space is unable to serve the current needs much less be available to the community. The addition of a second gymnasium, featuring a suspended walking track, will accommodate increased demands and provide recreational space for the community.

Similarly, a second music room will be constructed to accommodate middle and high school students currently sharing one room. "Our music program is growing rapidly and the community not only enjoys the program but expects us to provide the necessary tools to our students," says Foltz. "Our goal with both upgrades to existing facilities and this new construction is to do everything we can to provide the academic environment for students and teachers that the community expects," says Polkinghorne. "Johnson Controls is helping us achieve that."