



CASE STUDY

Denver Public Schools leverages robotic floor scrubbers to solve labor challenges and increased demand for cleanliness





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Richard Archuletta
Director of Facility Operations
Denver Public Schools

Background

Denver Public Schools, DPS, is one of the largest school districts in the United States with 226 schools for 90,000 students, and 10 administrative facilities that total more than 16 million square feet of floors to clean. In early 2021, DPS purchased and deployed 14 Tennant T380AMR robotic floor scrubbers, powered by BrainOS®. In 2021, schools across the country were still grappling with increased hygiene responsibilities in their facilities due to the pandemic. That, coupled with staffing shortages that spanned the US and affected nearly every industry, including education, made meeting the increased demands even more of a challenge. Adding cleaning robots to their maintenance teams helped to close staffing gaps while increasing the efficiency and effectiveness of the cleaning programs for DPS. It also provided a trackable level of cleanliness that improved the safety and wellbeing of students as well as staff. The T380AMR robotic floor scrubbers improved maintenance operations within DPS considerably, prompting the district to invest in 6 additional autonomous floor scrubbers from Tennant in the summer of 2022, bringing the total to 20 T380AMR scrubbers. These robotic floor scrubbers are helping clean hallways, gyms, and cafeterias across the district.

Challenge

The cleaning challenges that DPS faced are the same ones that many businesses face: increased demand for cleanliness and labor shortages. "Reduced resources mean reduced capacity. Meeting customer service needs is an ongoing struggle that grows more challenging each year," says Richard Archuletta, director of facility operations for DPS. The district's internal quality assurance program had shown a decrease in scores related to cleaning. "We anticipate our scores will go up with these machines, as they are used daily and nightly to help improve the overall condition of in our spaces," says Archuletta.

Prior to the COVID-19 pandemic, the district's maintenance and cleaning department was experiencing serious funding gaps and was grossly understaffed. The pandemic exacerbated the issues, bringing them to a critical status. "When you don't have enough staff to meet all the needs of the facility due to funding, one of the things that drops off is floor reconditioning because health and safety cleaning tasks come first," Archuletta says. With staffing shortages being a hot topic, Archuletta states recent economic changes have only worsened a decades-long problem in the janitorial industry. The district is always looking for ways to save on time and budget, and still deliver a quality product. Necessary labor skills for maintenance employees, training expenses, and a competitive job market have left the district in a difficult position trying to keep up with demand. Presently, the school system shows many open cleaning and maintenance positions, a number that translates into about "75 percent of staff left to do 100 percent of the jobs," according to Archuletta. Understaffed teams lead to overworked employees. Research shows that when employees are overworked it can lead to increased stress and burnout, which leads to low morale. This results in increased absenteeism. The lack of effective and adequate employee support has caused employee absenteeism to reach critical levels. Archuletta notes "in light of these challenges, the changes in technology have advanced to the point where this type of equipment would help us be more efficient."

Solution

In an effort to address the staffing crisis for their maintenance teams while also providing a clean, safe, and healthy learning environment, DPS began exploring innovative solutions that would help increase productivity and cleaning effectiveness, and narrow the staffing gap. After considering several options, DPS selected Tennant's T380AMR robotic floor scrubber. According to Archuletta, "this program will help us fill a staffing gap that most urban school districts face, which is limited resources and funding to meet the ever-growing need for facilities." Several factors strongly impacted DPS's purchasing decision, including:

- Quality & serviceability of Tennant cleaning equipment
- Easy to use for non-technical employees to train, deploy, and adjust cleaning routes
- Powered by BrainOS from Brain Corp, the machines provide "proof of work" metrics, which help verify and optimize performance, and also facilitating data privacy and security
- Regular software updates mean the machines have the latest technology and are safe to use while students and staff walk the hallways

"There are tons of robots out there," says Archuletta, "but they need an operator's guidance to stay on track." With the support of Tennant and Brain Corp., deployment of the initial 14 machines went smoothly throughout 2021, and the benefits were noted and appreciated by DPS decision makers.



Results

The benefits of DPS's initial deployment of 14 units in September 2021 have persisted. The first 14 units clean autonomously an average of an hour and a half each day, per unit. During this 90-minute robotic cleaning, each machine scrubs an average of 20,000 square feet. In one-year, these 14 units have over 2,220 hours of autonomous run time, robotically scrubbing more than 30 million square feet!*

Cleaning and maintenance employees are enthusiastic about this new technology: robotic scrubbers allow staff to level up their own skills by managing the robotics. Furthermore, they are free to focus on other necessary tasks, meaning that they can accomplish more in a day than they could before the autonomous scrubbers were deployed. This has improved employee morale as well.

Leadership is very pleased with the performance and benefits of the first 14 scrubbers, which led to the purchase of an additional 6 units. "These robotic floor cleaners are a critical technology investment that are helping us enhance cleanliness in buildings across our entire district. This is a huge benefit to our staff and students, while maintaining operating costs," says Archuletta. "These scrubbers can cover more area in a shorter time while freeing up the maintenance staff to take care of other necessary duties that may have been pushed to the backburner due to staffing shortages – it's a win-win."

In all, the Tennant T380AMR robotic floor scrubbers have made a significant difference for Denver Public Schools, and will continue to yield significant returns on the district's investment going forward.



20

Number of robotic cleaners deployed by Denver Public Schools



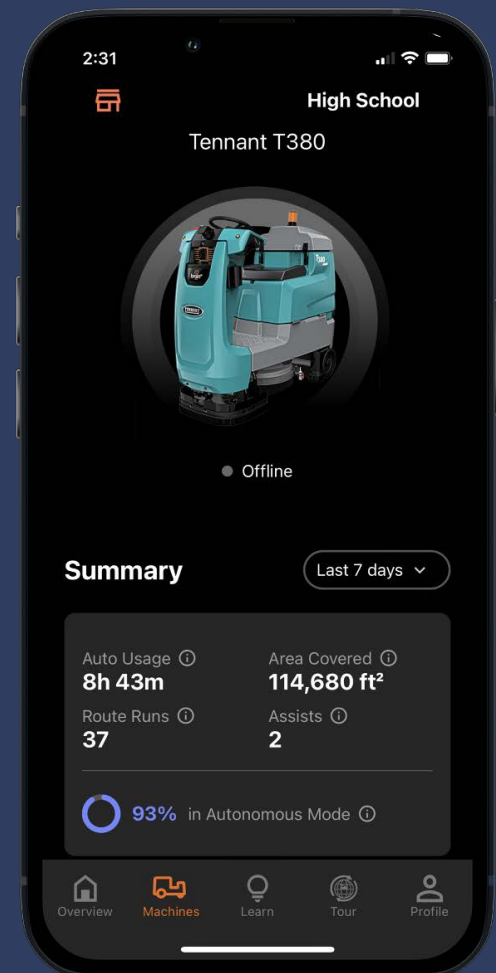
90 min

of average runtime by each robot per day at Denver Public Schools



20K ft²

of space cleaned by each robot per day at Denver Public Schools





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