



# Back-to-School Bundle



## Cleaning in Education: How to create an A+ Cleaning Program

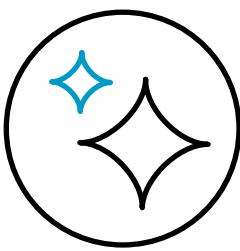
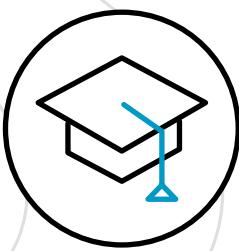
## Mechanize the Mop: How modernized floor cleaning technologies are delivering powerful competitive advantages

## Case Study: How Denver Public Schools leveraged robotic floor scrubbers to solve cleaning challenges



# Cleaning in Education

How to create an A+ Cleaning Program



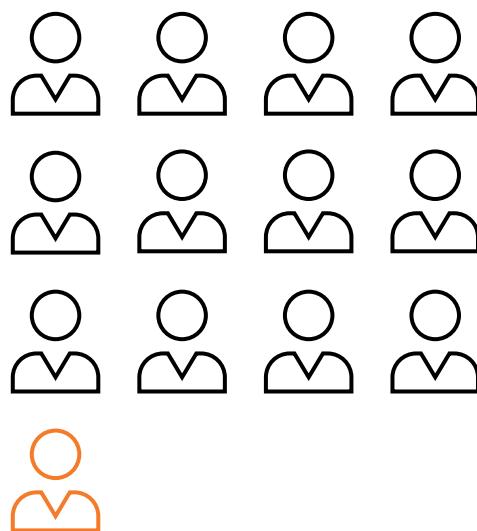


# Why Healthy Schools are Important

If you're concerned about the safety of the products you use in your home, a recent survey by Ipsos and NSF proves that you're not alone. 41% of respondents are very concerned about how safe their cleaning supplies were. The number jumps to 79% when the survey respondent was a parent.<sup>1</sup> Americans, including parents of students, staff, and other stakeholders, are more aware and are becoming very concerned about cleaning chemicals. It's time that sense of urgency regarding environmental health and safety be pushed to the forefront at schools, with deeper consideration and discussion regarding how we can make them a better workplace just as we work to make it a safer space for learning and growing students.

It's not just that school stakeholders becoming more aware and concerned. There are numerous studies by the EPA and its Science Advisory Board (SAB), linking poor indoor air quality, which includes effects of airborne pollutants such as cleaning chemicals, to side effects such as coughing and wheezing, shortness of breath, sore throat, red (and itchy) eyes, headaches, nosebleeds, skin rashes, or even asthma. According to the EPA, 1 in 13 children of school-age has asthma, which is the leading cause of school absenteeism due to chronic illness.<sup>2</sup>

**It's time that sense of urgency regarding environmental health and safety be pushed to the forefront at schools**



**1 in 13**

children of school-age has asthma, which is the leading cause of school absenteeism due to chronic illness.<sup>2</sup>



A custodial worker uses 194 pounds of chemicals each year, 25% of which are hazardous substances, which can exacerbate asthma symptoms. Additionally, custodial staff experience one of the highest rates of occupational asthma. Custodians also suffer the highest exposures to chemical products used in floor care, glass cleaning, disinfection, and indoor and outdoor pest control.<sup>3</sup> Purchasing and using only the least-toxic products for these tasks would help protect not just custodians but every member of the school community.

For these reasons, it's important to understand the ingredients that are in the products used in your school.



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**25% of which are hazardous substances<sup>3</sup>**

**Custodians also suffer the highest exposures to chemical products used in floor care, glass cleaning, disinfection, and indoor and outdoor pest control.<sup>3</sup>**



# How to Clean for Healthier Schools

Because of the harsh chemicals that can be present in cleaning supplies, and the nature of a custodian's work, it's important to help protect your custodial staff from potential negative health impacts. As an employer, you're required to provide appropriate ventilation around cleaning materials, but also to provide protective clothing. Another important requirement is that the cleaning chemicals must all have labels on them so your staff understands what they're exposed to on a regular basis.

Employers are also required to train staff about the hazards, as well as use and storage, of cleaning supplies prior to first use. They should also learn how to safely dilute the cleaning chemicals, and how to proceed if there is a chemical spill. Perhaps most important of all, they must be trained to use protective gear (goggles, gloves, and clothing) when using cleaning chemicals.

While there are potential dangers to using harsh cleaning chemicals, the good news is that there are alternatives to some of the more dangerous products. They're often called "green cleaners" and are certified by independent organizations as less harmful to the environment and safer to use. You may still be required to use protective clothing when you use them because even with regular use, they can be just as powerful and effective as the more dangerous cleaning chemicals without the same level of side effects or symptoms upon use. Green cleaners are also sometimes developed as fragrance-free solutions since scent really does nothing for the efficacy of its cleaning power and some users experience fragrance sensitivities.

**It's a myth that for something to be clean, it has to have a scent. In reality, clean doesn't have an odor!**

Source: [healthyschools.org](http://healthyschools.org)



# Disinfection Tips for Your School

The importance of maintaining a clean, healthy environment to protect students and educational professions is in the spotlight. The best practices for doing this are well established. Cleaning is the fundamental first step in this process. It cannot be skipped and it must be well-executed to get the results you want. You may not need to disinfect every surface, and slathering disinfectants everywhere just in case only serves to unnecessarily expose students and staff to potentially harmful chemicals every day. It's important to implement and follow situational policies and procedures for how and where sanitation and disinfection will be implemented in the school environment. Be sure to select an EPA-approved disinfectant and ensure the chemical you choose is approved for your particular application. The EPA maintains a list of **registered disinfectants** that meet its criteria and can be used to control the virus that causes COVID-19.<sup>4</sup>

While every space in a school environment may have special considerations based on the use case and possible contamination factors, common practice is that cleaning is needed in every nook and cranny of the school and frequently surfaces should be routinely cleaned and disinfected according to CDC recommendations. Reduce the spread of germs by keeping surfaces clean and reminding students of the importance of hand hygiene.<sup>6,7</sup>

AREA	DISINFECTION BEST PRACTICES
<b>Cafeteria or Food-Related Spaces</b>	Surfaces must be cleaned and then treated with food-contact sanitizer. You're trying to kill E. coli or other pathogens.
<b>Nurse's Office</b>	Counters and bed should be cleaned and disinfected with hospital-grade solutions, and appropriate care should also be taken with fluids, etc.
<b>Bathrooms</b>	Disinfectants are used after cleaning, with special emphasis on "touchpoints" (faucet handles, doorknobs, and sinks). You are trying to kill viruses and fungi.
<b>Classroom Desks</b>	Follow CDC recommendations to properly clean and disinfect surfaces and objects in the classroom that can help safely and effectively reduce the spread of disease in your school or facility. Be sure to use EPA approved disinfectants and avoid cleaning and disinfecting around students. <sup>5</sup>
<b>Hallways and Other Public Surfaces</b>	General purpose cleaning supplies should be used in hallways, carpets, floors, mirrors, and windows. Generally speaking, floors are deemed non-critical surfaces for most environments and disinfecting them has a limited effect.

Source: Greenschools.net and [CDC](#)

**Cleaning and disinfecting are key to limiting exposure to germs and maintaining a safe environment<sup>6</sup>**



# The Importance of Hand Washing

Cleaners and disinfectants are important, but much of the health and safety considerations in our schools can come down to just using soap and water to wash your hands. That's why so much focus is placed on teaching students to properly clean their hands. It's a powerful tool for helping to protect the entire school population from the spread of disease.

You've probably seen variations of the proper hand washing procedure in school or other public restrooms. Yet, we continue to discuss and rehash the benefits and best practices of washing our hands. It's such an easy procedure, and studies have shown that it can reduce exposure to viruses as well as other diseases or conditions. So, we'll keep talking about it, and (hopefully), continuing the discussion will inspire more hand washing.

As an alternative to handwashing, when soap and water are not convenient or easily accessible, you can use hand sanitizer. It's not the best choice or the best way to prevent disease, but it is better than nothing. It's important to understand, though, that not all hand sanitizer solutions are created equal. You should look for hand sanitizers that have a 60% to 95% alcohol concentration. Studies have shown that non-alcohol hand sanitizers don't work as well, that the solutions can irritate your skin, and that germs become resistant to those solutions.<sup>8</sup>



Look for hand sanitizers that have  
**60-95%**  
alcohol concentrations



# Cleaning Equipment for Healthy Schools

It's imperative to understand the importance of the cleaning equipment you use since the chemicals used with floor cleaning machines are part of the environmental health discussion. You can, and likely will, experience substantial environmental health benefits by incorporating vacuums or floor sweepers with high efficiency particulate air (HEPA) filters to achieve better overall air quality. The age of the school and the infrastructure is not something you can typically control, but you can still focus on improving the air quality. Better air quality has been proven to positively affect the health, safety, and efficiency of school buildings because, as discussed previously, the quality of the air has been linked to everything from sore throats, respiratory issues, asthma attacks, and even headaches and drowsiness.

Beyond the simplicity of focusing on the air we breathe; you'll want to consider the environmental impact of the products and services you use in your school. The products and equipment you use can have a correlation with waste management, energy conservation, and also the toxification of our environment. The solution is often easy and may even be cost-effective.

Additionally, many floor cleaning machines, like floor scrubbers, offer detergent-free cleaning solutions to further reduce the chemicals used on your school's floors. By cleaning with just water, you not only save money on cleaning chemicals, but also reduce the environmental impact of cleaning.

**Better air quality has been proven to positively affect the health, safety, and efficiency of school buildings<sup>9</sup>**



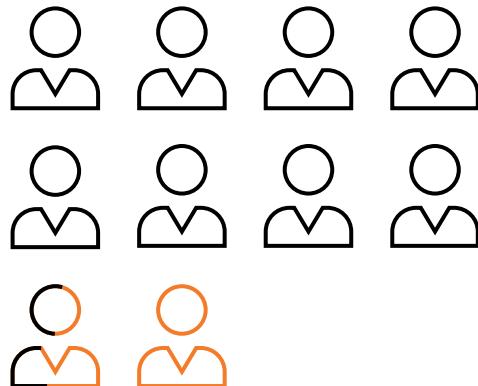
# Choosing Cleaning Products for Healthy Schools

The question sounds easy: How do you select the cleaning products that will support a healthy and safe school environment? You need to remove dirt, dust and other debris that adversely affect the overall cleanliness and health of the school, and cleaning products are a necessary component for maintaining your school's appearance.

As you dig deeper, though, you discover that cleaning is also about preventing illness, so the function of cleaning evolves, which often means using more powerful cleaning supplies. In the effort to clean and protect the school environment, though, students, and staff are also exposed to toxins that can cause health and environmental concerns. Fortunately, there are cleaning solutions that are specifically formulated to offer healthier and more environmentally safe cleaning.

**Here are a few factors to consider when you select products to use, according to the EPA:**

- What is the impact on the environment? Green cleaners help to improve air quality, while also helping to reduce air and water pollution.
- What about waste management? When you buy green cleaners in bulk you're also reducing waste. There's less packaging and you can often get them in a concentrated form to allow for dilution.
- Are they certified? Not all green products are the same, but if the product is certified, you know that an independent organization verified that it is less harmful to the environment and safer for you to use. Some 83% of respondents surveyed said they'd trust a "certified" product compared to a non-certified one.<sup>10</sup>



**83%**

of respondents surveyed said they'd trust a "certified" product compared to a non-certified one.<sup>10</sup>



When researching and purchasing cleaning products, purchasers should be sure to do their due diligence in interpreting claims from cleaning solution companies to ensure their products really are safer than their conventional counterparts. While this may add time to the purchasing process when choosing new suppliers, not doing the proper research may cause you to purchase products that aren't really as healthy as advertised.

### **What to look for in safer cleaning products:**

With all of the information available, it can be confusing and time consuming to change cleaning supplies. Here are some things to look for when researching safer cleaning products:<sup>11</sup>

- Minimal presence of corrosive or strongly irritating substances such as known carcinogens or reproductive toxicants, ozone depleting compounds or regulated hazardous materials
- Use of renewable resources, such as solvents from citrus, seed, vegetable and pine oils
- Low volatile organic compound (VOC) content
- Low flammability (flash point of > 200)
- Environmentally friendly packaging and shipping processes, such as refillable bottles, bulk shipping options, pump sprays versus aerosols, etc.

**Use cleaning products with renewable resources, such as solvents from citrus, seed, vegetable and pine oils<sup>11</sup>**



# Implementing a Healthy Schools Cleaning Program

The process and strategy for implementing a healthy school cleaning program will be different depending on your role. Here are three role-based categories to consider:



## Classroom Staff

Teachers and other classroom staff have limited time during the day, and a lot of those moments are spent on prep work, but there are ways that teachers and classroom staff can help to implement a healthy school cleaning program.



## Custodial Staff

Custodial staff are typically on the front lines, which means they have a high stake in implementing a healthier cleaning program and should be involved in decision making.



## Principals

As the leader of the school, principals potentially have the biggest impact for implementing a healthy school cleaning program.



## What Can Classroom Staff Do?

- Leave the classroom ready to clean.
- Remove the debris from the floor.
- Turn over chairs onto the desks.
- Keep counters, desks, and other classroom spaces free of clutter and debris.
- Clean up spills right away. Clean and disinfect frequently touched surfaces and objects.<sup>6</sup> Use microfiber cloths for cleaning.
- Participate in discussions about how to improve health and safety strategies.

It may sound overly simplistic, but a few key strategies to ready the classroom for cleaning can allow the custodial staff to spend less time on incidental cleaning requirements. A clean classroom and cleared workspaces can also contribute to better learning retention, productivity, and growth as a student while helping to alleviate some of the most basic frustrations of classroom staff.

## What Can Custodial Staff Do?

In addition to experiencing the highest rates of occupational asthma, custodians can suffer serious chemical burns to the skin or eyes, and they inhale chemical vapors, which can also cause injury. Here are a few ways that custodial staff can help with the implementation of a healthy school cleaning program:

- Make sure they've been properly trained in the use of all cleaning supplies.
- Request less toxic, 3rd-party certified cleaning supplies and tools.
- Prioritize custodial duties to those areas most frequented.
- Immediately address spills.
- Judiciously target disinfectant use.
- Always use appropriate health and safety precautions.
- Participate in discussions about how to improve health and safety strategies.
- Learn about safer chemical choices through the EPA's Safer Chemical List.<sup>11</sup>

An effective and safe school cleaning program will affect the health of custodial staff more than any other group of people in a school. Custodians should not have to worry about injuries or health conditions in their work environment. It's time for health and safety to really become the major focus.

## What Can Principals Do?

Principals potentially have the biggest impact for implementing a healthy school cleaning program. Here are just a few of the most helpful strategies:

- Approve the purchase of less toxic, 3rd-party certified cleaning supplies and tools.
- Educate teachers, students, and parents about green cleaning.
- Train staff to use green products and more environmentally safe procedures.
- Encourage and/or mandate wide-spread participation to improve health and safety strategies.

Health and safety procedures are in place, but it's a matter of molding those policies toward a more green and healthy focus. Principals can tap into state or local district policy and can also work with the Health & Safety Committee to achieve the desired goals.



# It's time to clean for health

## Conclusion

You know that cleaning products can be hazardous and that indoor air quality is of utmost importance. Members of the school's population could experience unfortunate side effects from your school's current practices if you are not employing a cleaning program that supports the health and well-being of your staff and students in the best way possible. As you move forward toward the implementation of a healthy school cleaning program, try to:

- Use less toxic cleaning supplies.
- Use tools and equipment that are proven to improve air quality and promote the health of those spending time in your school.
- Train all employees, not just custodians, on appropriate strategies for disinfecting.

### Get Help Keeping Your School Safe and Healthy

As a recognized industry leader, Tennant Company has made it our mission to change the way the world cleans. With products and solutions designed to help create a cleaner, safer, healthier world, we can help you build a cleaning program that keeps students and staff safe.

Contact us to find a healthy school solution

**800.964.9644** [tenantco.com](http://tenantco.com)

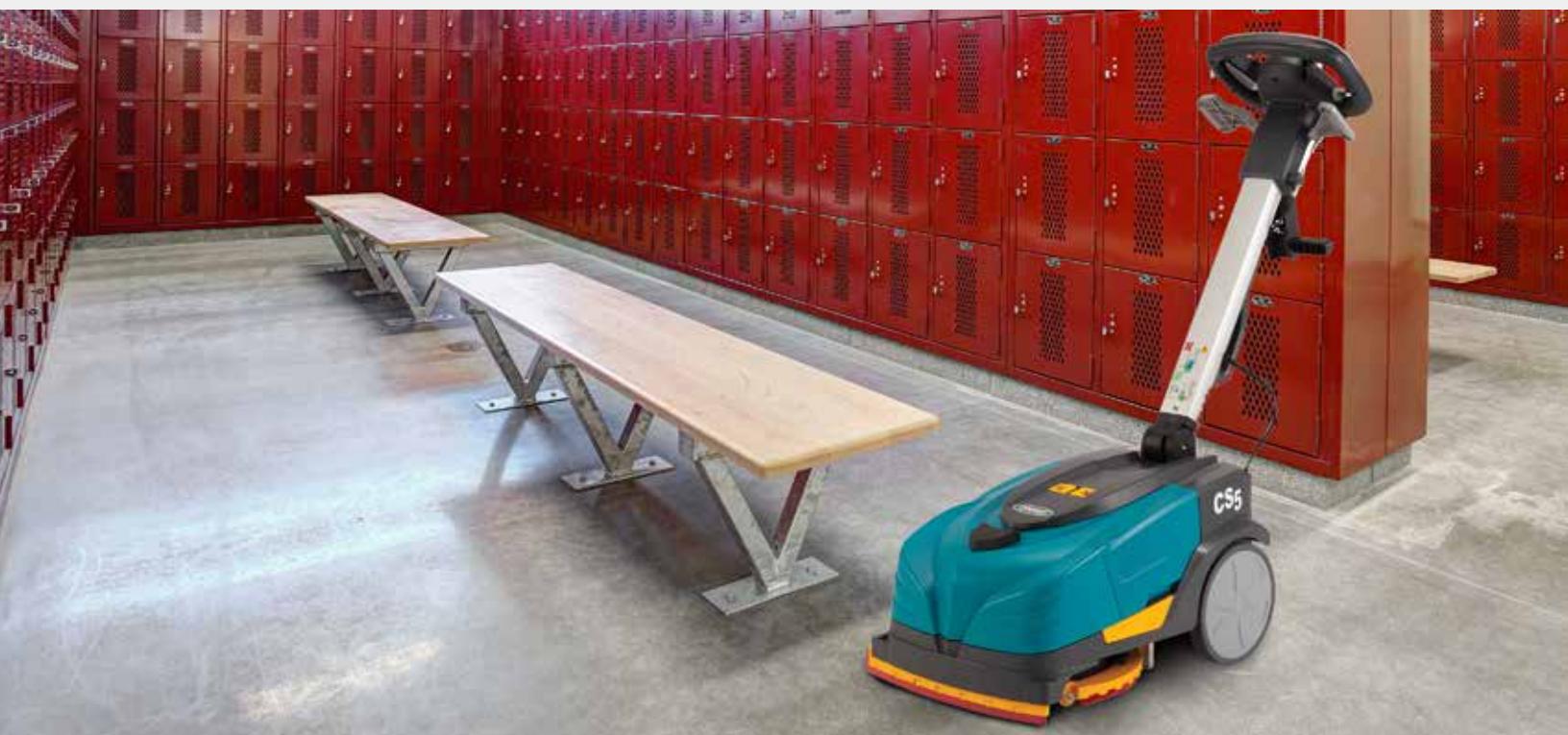


## Notes

- <sup>1</sup> NSF International. (May 16, 2019). When thinking about cleaning products, how concerned are you about the following factors? [Graph]. In Statista. Retrieved September 24, 2019, from <https://www.statista.com/statistics/1035374/consumers-health-and-safety-concerns-of-cleaning-products-us/>
- <sup>2</sup> <https://www.epa.gov/iaq-schools/why-indoor-air-quality-important-schools>
- <sup>3</sup> [https://drive.google.com/file/d/0B-jj-Uqv\\_J65MViFdEVUZ2VjX2s/edit](https://drive.google.com/file/d/0B-jj-Uqv_J65MViFdEVUZ2VjX2s/edit) via <http://www.healthyschools.org/>
- <sup>4</sup> <https://www.epa.gov/pesticide-registration/list-n-disinfectants-coronavirus-covid-19>
- <sup>5</sup> <https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/clean-disinfect-hygiene.html>
- <sup>6</sup> <https://www.cdc.gov/coronavirus/2019-ncov/downloads/community/schools-childcare/cleaning-disinfecting-school-classrooms.pdf>
- <sup>7</sup> <https://www.cdc.gov/coronavirus/2019-ncov/downloads/community/schools-childcare/Six-Steps-for-Cleaning-Disinfecting-school.pdf>
- <sup>8</sup> <https://www.cdc.gov/handwashing/show-me-the-science-hand-sanitizer.html>
- <sup>9</sup> <https://www.epa.gov/iaq-schools/indoor-air-quality-tools-schools-preventive-maintenance-guidance-documents#proposition>
- <sup>10</sup> NSF International. (May 16, 2019). When thinking about cleaning products, how concerned are you about the following factors? [Graph]. In Statista. Retrieved September 24, 2019, from <https://www.statista.com/statistics/1035374/consumers-health-and-safety-concerns-of-cleaning-products-us/>
- <sup>11</sup> <https://www.epa.gov/greenerproducts/greening-your-purchase-cleaning-products-guide-federal-purchasers>

# MECHANIZING THE MOP

How modernized floor cleaning technologies are delivering powerful competitive advantages.



# INTRODUCTION

## A TURNING POINT IN MECHANIZED FLOOR CLEANING

Clean is more critical than ever to the success of many organizations. Yet with labor pressures continually rising, institutions are looking for innovative ways to achieve the higher cleaning standards that drive satisfaction and loyalty — without shrinking their bottom line. Small spaces — from the rows of tables in a lunchroom, to tight spaces in common areas or classrooms, to the high-traffic demands of bathrooms and breakrooms — present a particular challenge, as small-space cleaning still depends heavily on manual processes like mop-and-bucket floor cleaning. Forward-thinking organizations are increasingly targeting the small-space cleaning challenge by leveraging mechanized cleaning technologies to help them drive more reliable cleaning performance, while realizing significant operational and labor efficiencies. Critically, it's not just market pressures pushing the rapid adoption of mechanized floor cleaning. Significant advances in the technologies are also making small, mobile automatic scrubbers more affordable and faster to implement — and easier and more cost-effective to use.

As more institutions leverage a new wave of practical, modernized floor cleaning technologies, they're not just reducing cleaning time and labor costs — they're also gaining more: more powerful cleaning capabilities, more reliable cleaning performance, and more satisfied customers and employees.

People have a heightened awareness of cleanliness, and “clean” has become the visible proxy for “healthy and safe.”<sup>1,2,3</sup>

## THIS WHITE PAPER WILL DIVE DEEP INTO THE WHY AND THE HOW OF THE SHIFT TO MODERNIZED FLOOR CLEANING, TO HELP YOU UNDERSTAND:

- Rising pressures that are driving rapid adoption of mechanized floor cleaning
- How new automatic scrubber technologies simplify implementation and accelerate ROI
- How to know if your organization is ready for modernized floor cleaning
- Best practices for smoothly and successfully “mechanizing the mop”

## CLEAN IS MORE CRITICAL THAN EVER

The concept of “clean” has always been an important foundation for organizations. Clean spaces keep people happy and healthy, protect the brand and reputation of the organization, and can even help improve productivity. But clean was cast into the spotlight as never before in 2020, as the pandemic pushed public health to the front of minds. People have a heightened awareness of cleanliness, and “clean” has become the visible proxy for “healthy and safe.”<sup>1,2,3</sup>

This increased awareness and sensitivity to facility cleanliness is expected to be a long-term shift. Where consumers (and employees) traditionally assumed a basic level of safety and cleanliness in most organizations, that is no longer taken as a given. That trust is gone, replaced by what Ernst & Young calls the age of the “anxious consumer.”<sup>4</sup>

### CLEAN EXPECTATIONS IN THE AGE OF THE ANXIOUS CONSUMER

**85%**  
of consumers say that  
**VISIBLE CLEANING  
IS CRITICALLY  
IMPORTANT**<sup>5</sup>

**7 in 10**  
consumers say they’re  
**MORE AWARE OF  
HYGIENE & SANITATION**  
when they visit retailers<sup>6</sup>

**1 in 4**  
consumers say  
**CLEANING & SANITATION IS  
THE TOP FACTOR**  
in choosing which businesses to visit<sup>7</sup>

### “Clean” is Now a Powerful Competitive Advantage

As consumers focus on clean, more organizations are actually gaining a powerful competitive advantage by differentiating their customer experience on the basis of exceptional, reliable, confidence-inspiring cleanliness. And it’s not just hotels and hospitality businesses — it’s organizations and schools of all types. Now is truly a unique moment for capturing this opportunity, as 3 in 4 consumers report they’re changing long-held loyalties and shopping habits.<sup>8</sup> By delivering these confidence-inspiring, clean experiences, businesses can drive trust and loyalty that keeps customers coming back (and telling others). Recent research indicates that cleanliness is a major concern when selecting a convenience store, ranking as the third most important factoring when choosing a pitstop.<sup>9</sup> You can apply these findings to educational settings because not only is a clean facility important for student and faculty health and for improving the learning environment, it is also paramount to a school’s success.

## LABOR COSTS KEEP RISING

Labor has long been one of the biggest expenses in most organizations. When it comes to cleaning and facility maintenance, labor can sometimes be over half of the budget. It's likely no surprise that 78% of managers say that improving labor productivity is a key priority.<sup>10</sup>

But while labor pressure is nothing new to most organizations, these pressures are seeing acute increases. The cost to hire, train and keep employees is higher than ever — and it keeps going up:



**2.4%  
INCREASE**  
in the overall cost of labor in  
2020<sup>11</sup>



Organizations in 25 states  
will see **INCREASED  
MINIMUM WAGE**  
in 2021<sup>12</sup>



**NEW OVERTIME  
RULES**  
went into effect in 2020<sup>13</sup>



**\$1,000**  
Average cost to train  
a new employee<sup>14</sup>

## MACHINES COMPLEMENT — NOT REPLACE — EMPLOYEES

Mechanization in any context is often thought of as a replacement for human labor. This is almost always an oversimplification at best. But in the case of modernized floor cleaning, it's a true misunderstanding of the potential value. As facility cleaning stays in the spotlight, organizations are doing more — more frequent cleaning, more deep cleaning, more detailed cleaning (wipe-downs and surface disinfection). Most of this "more" can't be mechanized. But the true operational value of mechanized floor cleaning is that it makes employees more efficient in completing routine floor cleaning — giving them more time to focus on this growing list of facility cleaning responsibilities.

# ONE EMERGING SOLUTION: MECHANIZING THE MOP

We've always been looking for ways to make cleaning easier, faster and more effective. From the simple broom, which dates back to 2300 B.C., to the invention of the first mechanized "carpet sweeper" in 1858, we have continually leveraged *mechanization* to improve cleaning.<sup>15</sup> The goal of mechanization has never been to take the human factor out of cleaning, but rather to make cleaning more efficient, so they can spend more time on other things.

Now, the humble mop and bucket are ready for a modern transformation in the evolution of cleaning — particularly when it comes to cleaning smaller spaces, including tight aisles, small entryways and heavily trafficked restrooms and breakrooms. More and more institutions of all sizes and types are looking to "mechanize the mop," leveraging floor cleaning technologies like automatic scrubbers to power greater cleaning performance in large and smaller, hard-to-reach areas.

## Mechanized Small-Space Floor Cleaning Drives Broad Competitive Advantages

The heightened importance of facility cleanliness, along with rising labor costs, are the two main pressures driving the rapid shift to modernized small-space floor cleaning. But those that have successfully "mechanized the mop" are realizing a much broader range of value. In other words, there's much more to mechanized scrubbers than just *faster* floor cleaning:

CLEANING PERFORMANCE	CUSTOMER SATISFACTION	BOOST EFFICIENCY	STAFF SATISFACTION
More effectively cleans and shines floors.	Ensuring consistently clean spaces to delight customers.	Enabling faster floor cleaning and clean tight spaces with ease and consistency.	Reducing the physical burden on staff and giving them more time for other responsibilities.
SAFETY	PUBLIC HEALTH	SUSTAINABILITY	RE-DEPLOY LABOR
Reducing slip-and-fall risks and staff safety risks associated with heavy mop buckets.	Ensuring more effective cleaning and reducing cross-contamination risks of dirty mop water.	Reducing water and cleaning chemical usage.	Faster cleaning means staff can spend more time on other responsibilities.

## COMPETITIVE ADVANTAGES OF MODERNIZED SMALL-SPACE FLOOR CLEANING

### Maximizing Cleaning Performance

Today's advanced automatic scrubber technologies are able to clean a wide range of hard surfaces, and they are designed to handle everything from light-duty applications to the most rigorous needs. Whether it's routine cleaning of the aisles of a convenience store, or more difficult cleaning demands of restrooms, or even back-of-house food service applications, automatic scrubbers combine high-pressure scrubbing with the precise use of detergents to deliver improved cleaning performance over manual mop-and-bucket floor cleaning. The i-mop® XL Plus and i-mop® XXL Plus offered by Tennant can deliver up to 90% cleaner surfaces compared to conventional mopping, as confirmed with ATP testing.<sup>16</sup> One reason for this improved cleaning performance: mechanized floor scrubbers apply a powerful scrubbing action that cleans deep. For example, the i-mop and i-mop XXL can remove up to 4x as much soil, compared to conventional wet-mop cleaning.

### Enhancing Customer Satisfaction

Let's be real: No customer wants to see a dirty mop and bucket. But today, customers increasingly do want to know that cleaning is being done and showing continuous cleaning can provide customers peace of mind. Scrubbers can safely be used during daytime hours and are much less disruptive than mop-and-bucket cleaning. This enables organizations to show customers that they're continually cleaning and protecting the health and safety of their customers and staff.

### Boosting Labor Efficiency

While actual efficiencies depend on the specifics of the space being cleaned, studies have found that floor scrubbers can deliver a dramatic boost in cleaning efficiency when compared to mop-and-bucket cleaning. Studies have found that cleaning with an automatic scrubber can be up to 6-8x faster than manual mop cleaning.<sup>17</sup>

### Re-Allocating Labor

With employees spending significantly less time juggling the mop and bucket, the ultimate outcome is not a reduction in staff — after all, most facilities have plenty of work to go around. Rather, businesses can re-deploy staff to spend more time on other responsibilities. That may mean focusing on more intensive cleaning tasks like surface wipe-downs and disinfection — or it may mean freeing-up employees to spend more time delivering great service to customers.

### Improving Safety

The typical slip-and-fall injury costs employers \$40,000 — and more than half of slip, trip and fall injuries stem from a problem with the walking surface.<sup>18</sup> Automatic scrubbers can immediately and significantly mitigate this risk — to employees and customers — through nearly 100% water recovery and vastly faster drying times. In short, an automatic scrubber does not leave large swaths of wet, slippery floors like mop -and- bucket cleaning. Additionally, employees can reduce risk of injury by not having to manage a heavy mop bucket.

## **Protecting Public Health**

Basic, routine floor cleaning can play a big role in creating healthy, safe spaces and mitigating public health risks in a business. Critically, automatic scrubbers offer a powerful advantage in this regard: By cleaning with significantly cleaner water, they vastly reduce the cross-contamination risks that come as pathogens accumulate in dirty mop bucket water. Furthermore, automatic scrubbers enable more precise use of cleaning agents that require specific dilutions to be effective.

## **Sustainability Savings**

With more precise chemical dilution and high-pressure scrubbing capabilities, automatic scrubbers effectively clean floors using less water and less cleaning products. Today's scrubbers are impressively energy-efficient, as well. Many use sophisticated Lithium-ion battery technology that eliminates reliance on nonrenewable energy sources, maintains indoor air quality, and reduces the staff safety risks and time costs associated with traditional battery maintenance. Finally, the nearly 100% water recovery helps to mitigate chemical fumes and odors and support better air quality.

## **Enhancing Staff Satisfaction & Retention**

It's not just customer satisfaction that benefits from modernized floor cleaning — staff satisfaction also logically increases. Modern scrubbers significantly reduce the physical burden of floor cleaning, allowing workers to stand upright and clean with the push of a button. Workers also appreciate that these scrubbers empower them to do a more consistent and thorough job. Taken together, this helps businesses fight high turnover costs and retain their employees.

**Mechanized floor scrubbers apply a powerful scrubbing action that cleans deep.**

## NEW ADVANCES STREAMLINE THE PATH TO MECHANIZED FLOOR CLEANING

The majority of the advantages of mechanized floor cleaning detailed in the previous section are not new. What is new are the advances in automatic scrubber technologies that are eliminating the three common barriers that have kept businesses from adopting these valuable tools:

### Simple Usability & Easy Training

Ease-of-use has also always been a key concern. Mop and bucket cleaning is typically viewed as extremely simple. Yet in reality, science demonstrates that there is plenty of risk and room for error in manual floor cleaning. In contrast, today's scrubbers are engineered from the ground up to combine the convenience and ease of a mop and bucket, with the cleaning power of an automatic scrubber. These tools make it much easier to clean compared to mop-and-bucket approaches — inherently reducing dirty-water risks, ensuring proper cleaning agent dilution, speeding drying times, addressing operator ergonomics, etc. Though they use sophisticated technologies, automatic scrubbers are now the simpler, easier route to reliable floor cleaning.

### Reliable Uptime & Self-Service Maintenance

Today's floor scrubbers are built to be incredibly reliable and easy to maintain — built to continuously and dependably tackle a specific application — whether that's a heavy-duty need or lighter-duty cleaning. The same straightforward, operator-first design that makes this new wave of scrubbers easy to use, also enables simple, self-service maintenance. They're built to make it quick and easy for staff to troubleshoot and maintain, without needing to call in OEM service support. This self-service further optimizes uptime and reliability, reduces service costs and lowers the overall cost to clean.

### Value at Every Price Point

Cost can be a barrier to adopting modern cleaning technologies — not because these machines are costly, but rather because the point of comparison is a \$50 mop and bucket. But today, there are scrubbers available to fit most needs and price points — from budget-conscious and light-duty cleaning solutions, to scrubbers that can tackle more heavy-duty, rigorous cleaning demands. The initial investment may be greater than a mop and bucket, but the growing range of modernized, automatic floor cleaning technologies enables businesses to choose the right tool for their needs — and begin realizing the diverse return on their investment.

# HOW TO KNOW IF YOUR ORGANIZATION IS READY FOR MECHANIZED FLOOR CLEANING

More and more institutions are adopting mechanized floor cleaning technologies and rapidly gaining competitive advantages in their customer experience and operations. So, how can you decide if now is the right time for your business to “mechanize the mop?” The first step is to consider your overall strategic priorities. What are your biggest goals for the next year — or next five years? Modernized floor cleaning may help you achieve these goals:

ENHANCING EXPERIENCE & SATISFACTION	IMPROVING LABOR/OPERATIONAL EFFICIENCY
Mechanized floor cleaning can rapidly increase your floor-cleaning performance, helping you stand out from the crowd with consistently clean, sparkling floors and drive customer confidence in the health and safety of your organization.	Modernized floor cleaning can enable your employees to clean more efficiently, reducing the labor cost of floor cleaning — and enabling you to re-deploy staff hours to other tasks to boost efficiency.
PROTECTING SAFE & HEALTHY SPACES	INCREASING STAFF SATISFACTION & RETENTION
Modernized floor cleaning immediately elevates the cleanliness and safety of your facilities by ensuring 100% clean-water cleaning, offering proper dilution of cleaning agents and dramatically mitigating slip-and-fall risks.	Mechanized floor cleaning reduces the physical burdens of cleaning floors, while giving staff time back for other tasks. This helps drive higher job satisfaction and retention — powering better staff productivity as well as helping eliminate staff turnover.

## TIPS FOR SUCCESS

Advanced automatic scrubber technologies are easier to deploy and use than ever, making implementation of these tools a much lighter lift for organizations and institutions of all sizes. These tips and key areas of focus can help you drive a faster, smoother and more successful deployment of modernized floor cleaning in your business:

### 1. Choose the Right Model

It's important to consider the relative advantages of different models of implementing floor cleaning machines. In general, there are three options for your floor care program:

- **Self or In-House Cleaning:** Purchase equipment and supplies; hire labor.
- **Outsourced Cleaning:** Buy "the result" through use of hired cleaning contractors.
- **Hybrid Cleaning:** Purchase equipment and supplies; outsource labor.

### 2. Right Product/Equipment

With the wider range of floor scrubbing technologies available today, it's important to carefully select the right tools — and partner with the right manufacturer.

- **Application:** Choose a product that fits the specific use case(s) in your business.
- **Expected Lifespan:** Choose a product that aligns with your expected lifespan — how long you want to use the machine to fully realize ROI.
- **Align Price & Value:** Price is an essential factor, but make sure you choose a product whose overall value (ease of use, reliability, durability, vendor support, etc.) matches its price point.

### 3. Focus on Prevention & First Impressions

You know first impressions are critical — and 95% of consumers say that great cleanliness can turn a good business into a great business.<sup>19</sup> Clean, shining floors are the literal foundation of those positive first impressions.

To support your regular floor cleaning program, consider these tips:

- By placing mats in the entryways, you can reduce dirt by 80-90%.<sup>20</sup>
- Small, maneuverable scrubbers and vacuums should be used to prevent dirt from being tracked further into your business.

### 4. Consider Spill Management

Routine floor cleaning is essential, but spills present acute challenges. Risk increases, and image suffers when spills are left to sit.

- Put in place a spill management process to increase safety for your customers and employees.
- Utilize small, micro-scrubbers for quick cleaning and water pick-up, leaving the area dry and immediately ready for customer use.

### 5. Staff Training

Today's automatic scrubbers are easier than ever to learn and use. But allocating proper time for staff training is still the most essential component of ensuring you realize all the benefits from more effective and efficient mechanized floor cleaning.

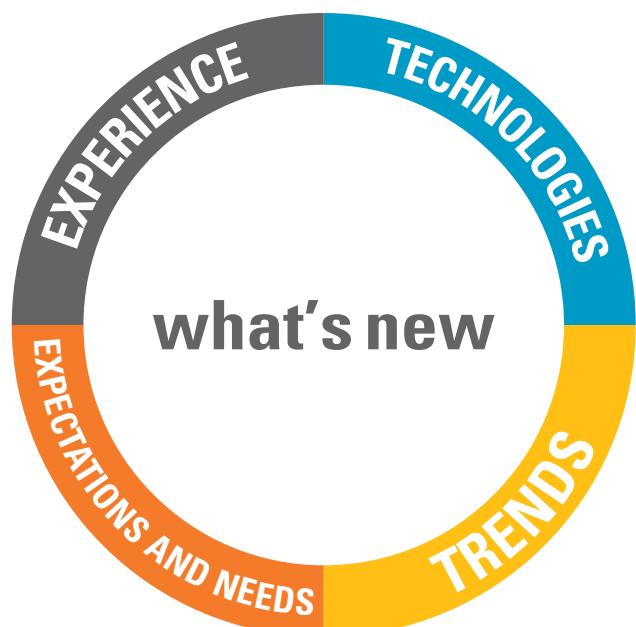
- Build staff buy-in by communicating the "what's in it for me" around easier, faster cleaning and reduced physical burden/risk.
- Thoroughly train staff on "right way" use of scrubbers, leveraging job aids like wall charts and videos.
- Build a successful on-boarding program and frequently retrain to support cleaning compliance.

## KEEPING PACE IN THE “NEW NORMAL”

Keeping up with “what’s new” has always been the name of the game for most organizations. Whether it’s new trends, new customer expectations or needs or new technologies, you keep customers coming back by convincing them that you’ll be one step ahead in delivering what they want (even before they know they want it). But the biggest trend today has nothing to do with what’s on the shelves or what’s on the menu — it’s the experience you deliver. This trend has been dramatically amplified in the COVID19 world. More than ever, customers are judging their entire experience based on first impressions of the appearance and cleanliness of your spaces.

Fortunately, these rising expectations are perfectly timed with a new generation of simple-to-use and cost-effective cleaning technologies — like agile automatic scrubbers, designed to clean large and small spaces. Just as the vacuum cleaner transformed the cleaning of carpeted surfaces, increasing adoption of automatic scrubbers is now transforming hard-floor cleaning in the small, tight spaces of organizations of all sizes.

But today, organizations have an opportunity to get ahead of this wave and drive powerful competitive advantages. By leveraging modernized floor cleaning technologies, businesses can rapidly create a customer experience that stands out from the crowd, earning invaluable customer trust and loyalty and driving measurable value on the top line. Just as critically, deploying these simple tools can rapidly power operational efficiency, productivity and staff satisfaction that drives the bottom line of your success.



## READY TO MODERNIZE YOUR FLOOR CLEANING?

For more information or to find out if automatic scrubber machines may be right for you, visit us at [Tennantco.com](http://Tennantco.com) or call us at 800.540.1399.

## NOTES:

<sup>1</sup><https://www.deloittedigital.com/content/dam/deloittedigital/us/documents/offerings/offering-20200626-safety-cleanliness-covid.pdf>

<sup>2</sup>[https://www.ey.com/en\\_gl/consumer-products-retail/how-to-serve-the-anxious-consumer-after-covid-19](https://www.ey.com/en_gl/consumer-products-retail/how-to-serve-the-anxious-consumer-after-covid-19)

<sup>3</sup><https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/survey-us-consumer-sentiment-during-the-coronavirus-crisis>

<sup>4</sup>[https://www.ey.com/en\\_gl/consumer-products-retail/how-to-serve-the-anxious-consumer-after-covid-19](https://www.ey.com/en_gl/consumer-products-retail/how-to-serve-the-anxious-consumer-after-covid-19)

<sup>5</sup><https://www.deloittedigital.com/content/dam/deloittedigital/us/documents/offerings/offering-20200626-safety-cleanliness-covid.pdf>

<sup>6</sup>[https://www.ey.com/en\\_gl/consumer-products-retail/how-to-serve-the-anxious-consumer-after-covid-19](https://www.ey.com/en_gl/consumer-products-retail/how-to-serve-the-anxious-consumer-after-covid-19)

<sup>7</sup><https://www.mckinsey.com/business-functions/marketing-and-sales/our-insights/survey-us-consumer-sentiment-during-the-coronavirus-crisis>

<sup>8</sup><https://www.mckinsey.com/~media/mckinsey/industries/retail/our%20insights/how%20covid%2019%20is%20changing%20consumer%20behavior%20now%20and%20forever/how-covid-19-is-changing-consumer-behavior-now-and-forever.pdf>

<sup>9</sup><https://www.gasbuddy.com/newsroom/pressrelease/957?fvm=1>

<sup>10</sup><https://www.cmmonline.com/articles/survey-says>

<sup>11</sup>U.S. Bureau of Labor Statistics

<sup>12</sup>Wolters Kluwer Legal & Regulatory U.S.

<sup>13</sup>U.S. Department of Labor

<sup>14</sup>Bizlibrary.com

<sup>15</sup><https://www.popularmechanics.com/technology/gadgets/a20973/history-of-the-vacuum-cleaner/>

<sup>16</sup>ATP (Adenosine Tri-Phosphate) is the name of an energy molecule that is an indicator of biological contamination invisible to the naked eye. Detection of ATP is recognized as the most reliable quantitative monitoring and inspection method to measure the effectiveness of cleaning procedures.

<sup>17</sup>Time to clean 100 m<sup>2</sup> (≈ 1,100 sq ft) based on ISSA 612 Cleaning Times Calculator

<sup>18</sup>[https://www.cdc.gov/homeandrecreationsafety/falls/data/index.html?CDC\\_AA\\_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhomeandrecreationsafety%2Ffalls%2Fallcost.html](https://www.cdc.gov/homeandrecreationsafety/falls/data/index.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fhomeandrecreationsafety%2Ffalls%2Fallcost.html)

<sup>19</sup><https://facilityexecutive.com/2017/11/business-cleanliness-matters-to-consumers/>

<sup>20</sup><https://www.cleanlink.com/sm/article/Proper-Matting-Keeps-Entryways-Clean--13381>



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

## 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. Throughout 2021 and 2022, DPS has purchased and deployed 20 Tennant T380AMR robotic floor scrubbers, powered by BrainOS®.

Schools across the country are still grappling with increased hygiene responsibilities in their facilities due to the pandemic and post-pandemic expectations. 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. DPS initially deployed 14 robotic scrubbers in late 2021; based on initial results, they added 6 additional robots 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 Archuleta, 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 Archuleta.

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," Archuleta says.

With staffing shortages being a hot topic, Archuleta 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 Archuleta.

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. Archuleta 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 Archuleta, "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 Archuleta, "but they need an operator's guidance to stay on track." With the support of Tennant and Brain Corp., deployment of the 20 T380AMR machines went smoothly, and the benefits were noted and appreciated by DPS decision makers.

## RESULTS

DPS has realized outstanding results and benefits since deploying the 20 robotic scrubbers. These 20 units clean autonomously an average of an hour and a half each day, per unit, that's nearly 30 labor hours, per day! During this 90-minute robotic cleaning, each machine scrubs an average of nearly 21,000 square feet. Since the initial deployment, these 20 machines have over 5,500 hours of autonomous run time, robotically scrubbing more than 73 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 Archuleta. "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.



EACH UNIT



90 MINUTE  
RUN TIME  
PER DAY



21,000  
SQUARE FEET  
PER DAY



20  
UNITS



5,500 HOURS  
RUN TIME



73 MILLION  
SQUARE FEET

\*Data is September 2021-May 2023.