American School&University®

SHAPING FACILITIES AND BUSINESS DECISIONS
asumag.com | schooldesigns.com

SEPTEMBER 2021

antron®

a higher standard of carpet fiber

Strength of Color

More than 350 colors to choose from, all designed to look better and last longer. Specify Antron® fiber at your favorite carpet mill or look for running line styles with Antron® fiber at Bentley Mills®, Mannington® Commercial, AtlasMasland® or Tarkett.

[Elevated Engineering™]

Indoor Air Quality is Fundamental

Greenheck helps create a safe, healthy, and comfortable atmosphere in classrooms.

Greenheck ventilation systems contribute to a more comfortable classroom environment, allowing students to be more alert, productive, and able to learn. Greenheck products work together to provide proper ventilation, filtration, dehumidification, and air circulation that improves indoor air quality in schools. Learn more about our **school ventilation solutions**.

EXPERTS IN AIR MOVEMENT SINCE 1947. LEARN MORE AND FIND YOUR GREENHECK REP

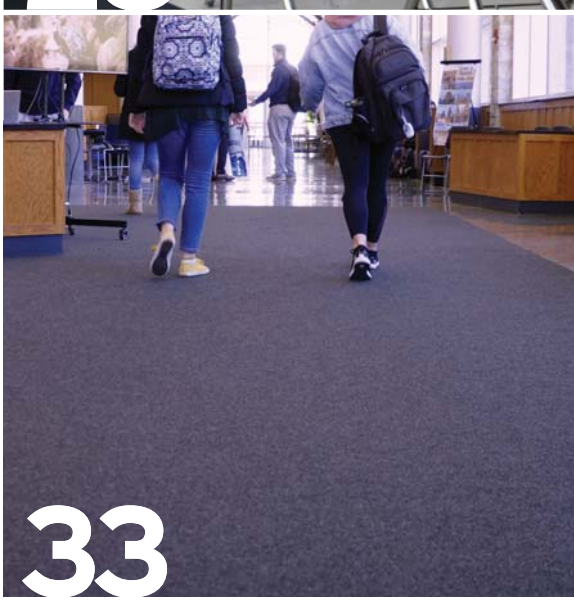
greenheck.com

GREENHECK®
Building Value in Air.

FANS | ENERGY RECOVERY | PACKAGED VENTILATION | MAKE-UP AIR | KITCHEN VENTILATION | LAB EXHAUST | DAMPERS | LOUVERS | COILS

contents

volume 94 • issue 1 • september 2021



COVER STORY

FEATURES

DEPARTMENTS

IN EVERY ISSUE:

American School & University, (ISSN: 0003-0945) September 2021, Vol. 94, No. 1. Published monthly except for combined issues in January/February and May/June and November/December free to qualified persons in the United States by Endeavor Business Media, 1233 Janesville Ave., Fort Atkinson, WI 53538 (endeavorbusinessmedia.com). Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates: USA:1 year $69, 2 years, $109; Canada: 1 year $79, 2 years, $139; other international: 1 year $99, 2 years, $159. For subscriber services or to order single copies, call customer service at (847) 559-7598 or send an email to americanschool@omeda.com. Postal/Email List Rentals: Smart Reach sr-assets@endeavorb2b.com. Periodicals postage paid at Fort Atkinson, WI and at additional mailing offices. Canadian GST #R126431964. POSTMASTER: Send address changes to American School & University, PO Box 3257, Northbrook, IL 60065-3257 USA. Allow 6 to 8 weeks for change of address.

Future Proven Innovation

Delivering comfort that will make the grade

With Mitsubishi Electric Trane as your partner in innovation, you don't have to compromise comfort or efficiency. Provide the next generation with next-generation technology. Our CITY MULTI® Variable Refrigerant Flow zoning systems enhance the learning environment with precise comfort control, quiet operation and building resiliency.

TRANE

MITSUBISHI ELECTRIC

A better way to heat and cool any building, anywhere.

MitsubishiComfort.com

Masking Conflicts

By Mike Kennedy

It's September, and this was supposed to be the time that schools and universities were beginning to get back to the way things were before coronavirus became part of our vocabulary.

But, as Dr. Anthony Fauci, President Biden's chief medical adviser, warned the nation many months ago as all of us were growing impatient and yearning for a return to normalcy: "You can't make the timeline—the virus makes the timeline."

The virus in this case is not the original strain of Covid-19 that forced nearly every education institution to shut down in-person instruction in spring 2020. It's the Delta variant of Covid-19.

The U.S. Centers for Disease Control and Prevention says Delta has become the dominant Covid-19 in the United States. It's more than twice as contagious as previous variants, and some data suggest that Delta might cause more severe illness that previous variants in people who have not received a Covid-19 vaccination.

Covid-19 vaccines have been shown to be effective against the Delta variant, but because many people have not gotten a vaccination, and because children under 12 are not authorized to receive a Covid vaccination, the CDC has revised its recommendations for indoor spaces such as schools.

As the 2021-22 school year commences, students and teachers returning to classrooms are being told to follow some of the same precautions that were in place the last 18 months. The CDC recommends layered protection strategies to combat the virus—frequent hand washing, social distancing, quarantining of persons who have come into contact with the virus, and screening testing.

And masks.

"CDC recommends universal indoor masking for all teachers, staff, students, and visitors to K-12 schools, regardless of vaccination status," the center says.

Having to resume mask wearing after being told that vaccinations had made them no longer necessary has been a frustrating setback. Still, many school districts, heeding the CDC's medical guidance, have decided to impose mask mandates for students and staff.

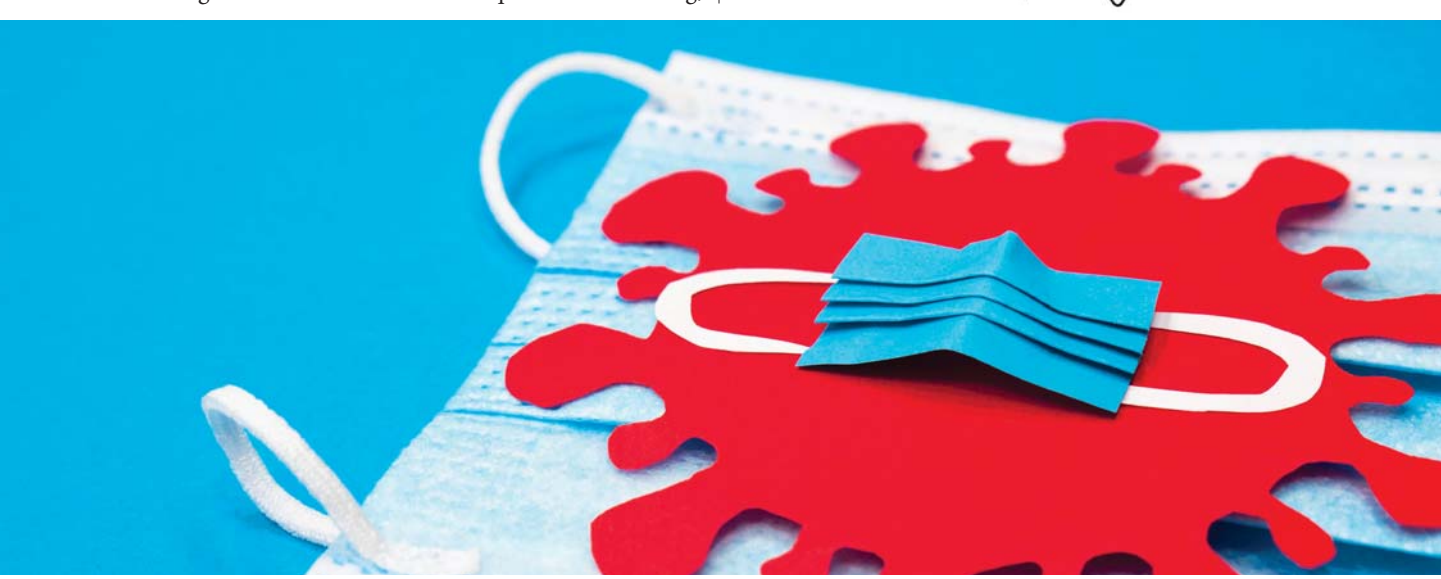
But what is a health and safety issue for those advocating masks is characterized as a personal freedom issue for those skeptical about the need for masks in schools.

Governors in Texas and Florida have rejected the CDC guidance and have ordered districts not to impose mask mandates, and courts in those states have blocked, at least temporarily, enforcement of the bans.

The Associated Press reported in late August that lawsuits have been filed in at least 14 states—some seeking to overturn state bans on mask mandates, and some challenging the mask mandates imposed by states or school systems.

As the legal battles play out, school administrators should keep their focus on their top priority: the health and safety of students and staff.

Mike Kennedy



$33 million high school will replace earthquake-damaged facilities in Alaska

Matanuska-Susitna Borough School District

More than two years after an earthquake destroyed one of its middle schools, the Matanuska-Susitna Borough (Alaska) School District is building a $33 million high school that will replace the lost space.

The Mat-Su Valley Frontiersman reports that constructing new facilities for Houston High School in Houston, Alaska, will enable the district to convert the existing Houston High to Houston Middle School.

The former Houston Middle School campus was torn down after sustaining irreparable damage in a major earthquake in November 2018. The new high school is being built on the site of the former middle school.

Since the earthquake, middle school students have been attending classes in portable classrooms on the campus of the existing high school.

The new high school will have 93,000 square feet of space; the Mat-Su Borough Assembly last month approved a $33.3 million construction contract for the school.

The Federal Emergency Management Agency approved funding in May that will enable the district to replace the earthquake-damaged school space.

https://asumag.com/21169705

Chicago Schools will transition to elected school board in 2026

Chicago Public Schools

Chicago voters will elect their school board beginning in 2026.

The Chicago Tribune reports that a 21-member elected board will take the place of a seven-member panel appointed by the mayor and approved by the city council.

State legislation calls for the board overseeing Chicago Public Schools to transition to a hybrid panel in 2025; 10 members will be elected from geographic districts and 11 members, including a board president, will be appointed by the mayor.

The appointed members will be replaced with elected ones in a 2026 election.

Chicago Mayor Lori Lightfoot and other opponents of the changes have criticized the size of the new board and argued that taking away mayoral control would politicize school governance, threaten academic gains and give too much power to the Chicago Teachers Union.

But others said the mayor's office has historically had too much power. University of Illinois at Chicago professor Dick Simpson said the city needs to be "moving toward a more deliberative, participatory democracy than Chicago is used to under the boss mayor system and machine control that goes back nearly 100 years."

https://asumag.com/21171080

Defense department plans new elementary at Fort Knox in Kentucky

Department of Defense Education Activity

The Department of Defense Education Activity has announced plans to replace a 63-year-old elementary school at the Fort Knox military base in Kentucky

The Elizabethtown News-Enterprise reports the new Van Voorhis Elementary School will cost $58.9 million and have 104,000 square feet of space. It has been designed with an open neighborhood concept so students can work together.

Van Voorhis Elementary, one of four schools at Fort Knox, is the oldest school facility on the base.

The new facility is scheduled to open during the 2024-25 school year.

https://asumag.com/21172844

American School&University

WWW.ASUMAG.COM
WWW.SCHOOLDESIGNS.COM

CONTENT DIRECTOR/ASSOCIATE PUBLISHER
Joe Agron • jagron@endeavorb2b.com

SENIOR EDITOR • Mike Kennedy
mkennedy@asumag.com

ART DIRECTOR • Tim Driver
tdriver@endeavorb2b.com

ASSOCIATE EDITOR • Brooke Just
bjust@endeavorb2b.com

EDITORIAL CONTRIBUTORS • Stephen Ashkin; Paul Erickson; American Institute of Architects Committee on Architecture for Education

EDITORIAL ADVISORY BOARD
- Bruce Mather, Executive Director of Facilities Management, Elmhurst College, Ill.
- Martin Montaño, Capital Projects Administrator, Rio Rancho Public Schools, Rio Rancho, N.M.
- James E. Rydeen, FAIA, Armstrong Torseth Skold and Rydeen, Inc., Minneapolis

VICE PRESIDENT, BUILDINGS & CONSTRUCTION GROUP
Mike Hellmann
mhellmann@endeavorb2b.com

GROUP EDITORIAL DIRECTOR - BUILDINGS & CONSTRUCTION GROUP
Mike Eby • meby@endeavorb2b.com

SENIOR MARKETING MANAGER • Molly Roudebush
mroudebush@endeavorb2b.com

SENIOR PRODUCTION OPERATIONS MANAGER
Greg Araujo • garaujo@endeavorb2b.com

PRODUCTION MANAGER • Brenda Wiley
bwiley@endeavorb2b.com

ENDEAVOR BUSINESS MEDIA, LLC
CEO • Chris Ferrell
CRO/CMO • June Griffin
CFO • William Nurthen
COO • Patrick Rains
VP, Accounting • Angela Mitchell
VP, Finance • Jessica Klug
EVP, Group Publisher - Design Engineering and Power, Utilities & Buildings • Reggie Lawrence
VP, Digital Business Development • Monique Leija
EVP, Special Projects • Kristine Russell
VP, Production Operations • Curt Pordes
Chief Administrative and Legal Officer • Tracy Kane

SUBSCRIPTION CUSTOMER SERVICE:
(847) 559-7598
americanschool@omeda.com

ENDEAVOR BUSINESS MEDIA™

CORPORATE OFFICE:
ENDEAVOR BUSINESS MEDIA
PO BOX 803 • 1233 JANESVILLE AVE.
FORT ATKINSON, WI 53538
(920) 563–6388 • (800) 547–7377

ENDEAVORBUSINESSMEDIA.COM

UNLV adds all-gender bathrooms

The University of Nevada, Las Vegas, has significantly increased the number of all-gender bathrooms on its campuses.

The university says in a news release that the upgrades are the result of research and student feedback about top safety concerns on college campuses.

The Maryland Parkway and Shadow Lane campuses now have 165 all-gender classrooms, 129 of which have baby changing stations. These facilities are individual public restrooms, each with one toilet and one sink. Before the project began, the campuses had 13 all-gender restrooms and just eight included baby changing stations.

In 2019, UNLV formed a Safety and Security Working Group to identify key issues that affect the well-being of members of the campus community. The need for all-gender restrooms emerged as a top priority.

"We know that the benefits of all-gender restrooms run deeper than providing safety for trans and non-binary individuals," said Barbee Oakes, who was the university's chief diversity officer until she retired earlier this year. "Achieving this goal also has the potential to fundamentally transform the way that we think about gender equity; and signals that UNLV is striving to provide an equitable, inclusive campus for everyone."

Photo 93446644 © Joshua Rainey | Dreamstime.com

Research shows that gender-non-conforming students across the country face specific challenges that could be alleviated with the availability of all-gender restrooms.

Custodial crews conducted an inventory of all the single-fixture restrooms on UNLV's two campuses and determined which ones could accommodate baby changing stations while maintaining required restroom standards under the Americans with Disabilities Act.

Facilities management teams began installation and collaborated with colleagues in athletics and residence hall buildings to have signs and changing tables installed in their buildings.

Appeals court to hear transgender bathroom case

A full federal appeals court in Atlanta will hear the case of a transgender male student who was denied use of a boys' bathroom in 2017 at a Florida high school.

The Tampa Bay Times reports that the 11th U.S. Circuit Court of Appeals has vacated a ruling by a three-judge panel that had ruled in the student's favor. The judges said in a 2-to-1 opinion that a St. Johns County (Fla.) School Board policy preventing Drew Adams from using boys' bathrooms violated his rights.

After that ruling, the St. Johns board petitioned the full appeals court to re-hear the case; the court has granted the request.

Drew Adams was born a biological female, but in eighth grade told his parents he was a transgender male. He and his mother sued the St. Johns board in 2017 after administrators at Nease High School in Ponte Vedra, Fla., required Adams to use a gender-neutral, single-stall bathroom or girls' bathrooms.

The three-judge appellate panel had ruled that the district's policy about bathroom use was arbitrary because it relies on information submitted when students enroll in the district, rather than on updated information. Adams began attending the district in fourth grade, with information listing him as a female, but he later obtained legal documents listing him as a male. While the case wound its way through the courts, Adams graduated from Nease High School.

Meanwhile, in Tennessee, the Human Rights Campaign has sued to overturn a law that denies transgender students, faculty, and staff access to bathrooms, locker rooms and other sex-segregated facilities consistent with their gender identity. The suit contends that the Tennessee law violates Title IX of the Education Amendments of 1972, which prohibits discrimination on the basis of sex in federally funded education programs.

"When I started 7th grade, I just wanted to blend in," said Alex, 14, a plaintiff in the lawsuit. "Having to use a 'special' bathroom made me stand out because other kids would wonder why I didn't just use the boys' bathroom. It was also a pain because the bathrooms I was allowed to use were not close to any of my classes. So, I just stopped having anything to drink during the day." ■

Cleaning power that's ready for the biggest of mess makers

ProTeam

proteam.emerson.com

EMERSON

CONSIDER IT SOLVED™

By Mike Kennedy

Classroom building under construction at UC Santa Barbara

The University of California, Santa Barbara, has broken ground on its first new construction since 1967 that is dedicated to classroom space.

The school says completion of the four-story building is anticipated for spring 2023.

The building will have modernized lecture halls and classrooms with the latest interactive learning and instructional technologies. It will increase the campus's classroom seating capacity by 2,000 seats, or 35%. A plan also has been formulated for bicycle traffic and more than 1,800 bicycle parking spaces.

The new building will be a game-changer for students, says Jeffrey Stopple, associate vice chancellor of undergraduate education.

"We've retrofitted a lot of classrooms as best we can with modern technology, but it will be completely different to have classrooms designed for the use of technology and how that fits into today's innovative pedagogy," Stopple says. "Lecture halls are designed for 'active learning,' with seats that can turn so students can interact with each other in class. Project-based learning classrooms have multiple tables with whiteboard space and a shared computer monitor. Outdoor spaces encourage informal interactions."

Photo coursey of LMN Architects

The architect is LMN Architects.

Academic annex planned for Cal State Northridge

California State University, Northridge, is planning to construct an annex to one of the oldest and largest academic buildings on campus.

The university says it will break ground in 2022 on a 40,145-square-foot annex to Sierra Hall.

The Sierra Annex will be the first new academic classroom building at Cal State Northridge since 2009.

The $49.9 million project will add much-needed classrooms and lecture space, including a 3,050-square-foot lecture hall, two smaller lecture halls and four seminar rooms. The annex will have flexible seating, modern audiovisual equipment, and an energy-efficient design.

"The building is set up for the most flexible learning environments," said Ken Rosenthal, associate vice president of facilities development and operations. "All of the rooms will be larger in size than our normal classrooms, to allow the classes to reconfigure the furniture for breakout sessions, which you can't do in Sierra Hall. We paid particular attention to building in student collaboration spaces into the lobby, the corridors, the waiting areas. We built in seating, so students aren't sitting on the floor."

Photo coursey of California State University, Northridge

The Sierra Annex's design takes full advantage of natural light, says Diane Stephens, associate vice president for academic resources and planning.

"Sierra Hall has a lot of interior, dark classrooms — it's a very 1960s classroom building," she said. "So, this new building is very mindful of the wellness of students and faculty. The ability to have natural light in the space makes it warmer and more welcoming. I think it's going to end up being an iconic building."

Completion and opening of the new building are planned for fall 2023.

The Sierra Annex's opening will clear the way for the renovation of Sierra Hall, as classes there are shifted to the new building.

The architect is Gensler, and the construction firm is Gilbane.

Portland begins overhaul of 104-year-old high school

The Portland (Ore.) district has begun a major renovation of Benson Polytechnic High School.

The 104-year-old school will be closed for three years as it undergoes a $216 million overhaul.

The modernized campus will house a two-story building with wings that feature co-located career/technical education and core academic learning spaces, a courtyard with covered and uncovered outdoor classrooms and workspaces, and a central student commons/cafeteria connected to an internal courtyard designed to become the heart of the school.

The district is also upgrading the auditorium with improved lighting and audio-visual technologies.

Photo coursey of Portland Public Schools.

During construction, Benson Polytechnic will be housed at the Marshall campus in Southeast Portland.

The renovation will be complete by fall 2024.

Bassetti Architects is the architect, and Anderson Construction is the construction manager.

Jewish school in Ohio builds education complex on former country club

The Hebrew Academy in Cleveland Heights, Ohio, has built a $32.5 million educational complex to house the school's early childhood and boys' elementary grades.

The Cleveland Jewish News reports that the 103,000-square-foot complex sits on the 92-acre campus of the former Oakwood Country Club. The school already has renovated the 100-year-old clubhouse for use as its co-ed kindergarten, boys junior high school, boys high school and financial offices.

With the new building, the school gains 41 classrooms in a two-story building with elevators, technology hardwired into classrooms and a gymnasium and auditorium that can be split or combined with capacity seating for up to 1,000.

The facility has a hall dedicated to Torah study; an innovation lab for arts, science, technology, math and engineering projects; and an intervention center for students who need remedial assistance. There are two cafeterias, a library and offices for a nurse, social worker and administrative staff, as well as two receptionist areas.

More than 500 children will have elementary or early childhood classes in the complex.

The architect is Ronald Kluchin Architects Inc.

Computer science building under construction at University of Illinois Chicago

The University of Illinois Chicago (UIC) has begun construction of $117.8 million computer science facility.

The 135,000-square-foot Computer Design Research and Learning Center at UIC will provide needed space to accommodate the university's growing undergraduate enrollment in computer science.

"We reached a point where we started placing restrictions on the growth of the computer science department…simply because we did not have anywhere to put the students or the faculty," UIC Chancellor Michael Amiridis said.

The university anticipates 1,700 undergraduate students in computer science in the fall.

The building will be constructed on an accelerated schedule to meet the demands of the department, doubling its capacity. In addition to 15 classrooms, 35 labs, and collaborative teaching and learning spaces, the center will have an undergraduate learning and community center, auditorium, flexible events room, student affairs office spaces, and a five-floor daylighted atrium.

Photo coursey of LMN Architects.

It also will be the new home for UIC's Electronic Visualization Laboratory, an interdisciplinary research lab. A new geothermal farm will help provide sustainable heating and cooling of the building, which has been designed to achieve LEED Gold certification.

Completion of the building is expected in summer 2023.

The architect is LMN Architects.

Minnesota district completes first phase of K-12 campus renovation

The Roseau (Minn.) district has completed phase one of a $43 million expansion and renovation of its K-12 campus.

The project consists of 81,000 square feet of new construction and renovation of 60,000 square feet of existing space.

The initial phase included construction of a two-story classroom space for English, social studies and language classes.

The high school section of the campus will get new classrooms, including career and technical education space, a music suite for band and choir, and administrative and common spaces. Gymnasium spaces will be enlarged and upgraded.

The upgrades will replace aging building and major systems, including ventilation, heating, electrical, lighting, roofing, exterior walls and insulation.


Photo coursey ofKraus-Anderson.

Modifications to the elementary school will include safety and security enhancement at the primary building entrance, and improved parent and bus drop-off and pickup.

The contractor is Kraus-Anderson, and the architect is JLG Architects.

Science complex under construction at Alabama-Birmingham

The University of Alabama at Birmingham (UAB) is building a $76 million Science and Engineering Complex.

The 138,842-square-foot instructional facility will house classrooms alongside faculty and staff offices. The building will also include multiple collaboration rooms that encourage a team learning environment, including project-based research labs that allow for student shadowing.

UAB President Ray Watts says the complex will "accelerate our efforts to grow a robust, technology-based economy for our region and state, and educate the science-based workforce of the future."

The goal of the building is to enhance collaboration with other schools, including the School of Engineering, the School of Medicine and the Collat School of Business, while also fostering partnerships with business and civic leaders to facilitate local and statewide workforce developments and spur entrepreneurship and innovation.

The facility will be erected in the heart of campus, just across the street from The Hill Student Center, Heritage Hall, University Hall and the UAB Campus Green.

"The new complex provides enhanced facilities to support current and future faculty and students," says Pam Benoit, senior vice president of Academic Affairs and UAB's Office of the Provost. "We are excited about how the new facilities will support our evolving educational and research efforts."

Construction not finished, but Kansas district opens new high school

The Geary County (Kan.) district has welcomed students to a new high school in Junction City even though the facility still has ongoing construction.

KSNT-TV reports that the new Junction City High School campus is about 75% complete. Workers prioritized finishing classroom spaces so that students could return in August—two weeks later than other schools in the district.

The new campus is about 2.5 miles west of the old high school. It has nearly 440,000 square feet of space and offers four academic academies with 15 career pathways.


Photo coursey of Hutton Corp./Sensera.

Construction on the school began in April 2019. It has more than 150,000 more square feet than the old facility.

District Chief Operations Officer David Wild said that extra space enables them to add features not usually found in a typical high school.

"A great deal of more space, working environments, collaborative work areas in addition to classrooms, breakout areas, commons areas," Wild said. "It is much more like a university setting."

School officials say they expect to finish the auditorium and gymnasium around Labor Day. The rest of the athletic facilities are scheduled to be finished by the end of September.

The builder is Hutton Corp., and the architect is SCJF Architecture. ■

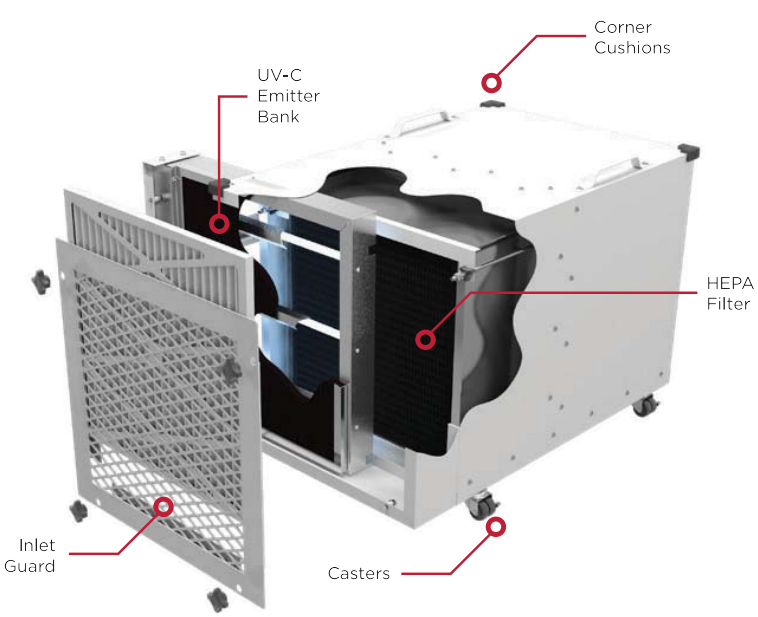
MAC UV

Mobile Air Cleaner

HEPA Filtration and UVGI in one package!

The MAC UV captures airborne pathogens and inactivates them with a UV-C light bath.

Standard Features:



- 180 watts of constant UV-C germicidal irradiation
- HEPA - 99.97% efficient filtration
- Airflow range: 500-1900 CFM
- Lorenized powder coat finish
- 4” swivel casters with locking brakes
- 9 foot, 115V power cord
- Variable speed control
- Illuminated on/off switch
- Run-time meter
- Corner cushions

COOK®

Contact your **Cook Representative** or visit **lorencook.com** for more information!

Outside Learning

Alternative learning spaces have grown in importance as schools deal with Covid-19.

By Mike Kennedy

For many years, it has not been uncommon for a school to take advantage of its entire campus and use the outdoor surroundings as an extension of the traditional classroom—play areas, gardens, nature walks, or just a change of pace from the four walls of a classroom.

In the Covid-19 era, outdoor spaces have become even more important as schools have had to make changes to create safer learning environments and protect students and staff from disease. Outdoor spaces can provide the additional area that schools need to achieve social distancing; in the outdoors, there is less transmission of the virus.

So schools that until now had not incorporated outdoor learning into their operations may be persuaded to do so.

"School districts across the United States can use their school grounds and local parks as safe outdoor learning environments to increase their capacity and options for social distancing as students return to school," says Green Schoolyards America, an organization that seeks to create more green spaces on school grounds. "Outdoor spaces will reduce the burden on indoor classrooms while providing fresh air, hands-on learning opportunities, and the health benefits associated with increased access to nature."

Outfitting the outdoors

The Nebraska Game and Parks Commission has identified several "must-have" features of an outdoor classroom:

- An entrance sign so that "everyone knows this is a dedicated space and everyone is welcome."
- Seating or benches for students, visitors and teachers to sit while making observations, reading or doing other lessons.
- Border or fence "to ensure the safety of students as well as allowing the teacher to focus attention on lessons, not student safety."
- Storage—a lockable space for equipment like shovels, rakes, and buckets. This can be inside a school or in a lockable shed.
- Tables for completing lessons and collecting data.
- A gathering space for the entire class to gather for a group lesson.
- Native plants; they will grow better and require less maintenance.
- Water; a water spigot is critical for garden maintenance.

Combating Covid

As part of the National Covid-19 Outdoor Learning Initiative, Green Schoolyards America is urging schools to establish outdoor learning areas not only to combat the spread of Covid-19, but also to improve the overall well-being of students.

"Investing in outdoor learning now, in response to the pandemic, addresses the urgent need for therapeutic mental health practices during this crisis and will also yield long-term health benefits for children," Green Schoolyards America says.

The organization has compiled a list of elements that will help schools create an effective outdoor learning space.

- **Low-cost seating solutions:** existing seating already on campus. "Many campuses have existing seating areas such as lawns, picnic tables, bleachers, built-in amphitheaters, and concrete walls. This seating can be easily adapted to accommodate physical distancing."
- **Outdoor teaching supplies:** clipboards, white boards, and a table for teachers; science, art, and math teaching tools; outdoor wi-fi access.
- **Protection from the sun:** tree canopies, shade umbrellas, tents, shade structures.

Photo 66312821 © Sonia Passanah | Dreamstime.com

- **Protection from rain and snow:** rain shelters, weather-appropriate clothing; contingencies to move inside when the weather is too wet or cold.
- **Storage:** supply sheds or bins; wagons for teachers to transport their supplies.
- **Hand washing stations:** portable stations or permanently installed outdoor sinks to so students and staff can clean their hands frequently.
- **Accessibility:** ADA-compliant paths of travel and seating in outdoor classrooms.
- **Bathrooms:** facilities directly connected to the schoolyard or otherwise easy to access from outside.
- **Outdoor clothing:** provide items for all children to protect them from the elements and ensure equity

The organization also recommends orienting outdoor classroom spaces to face north (away from the sun), so that students will not have sun in their eyes when looking at their teacher. Outdoor classrooms should be positioned far enough apart so that learning activities will not be audible or distracting for students in other classes.

American School & University®

Need to update your magazine subscription contact information?

If so, please enter **www.asumag.com/Update** into your browser then type in your account number (see your mailing label) and last name to access your information.

Don't like updating online?

Please feel free to contact customer service at **847-559-7598**.

If you would like to subscribe to *American School & University* magazine, please enter **www.asumag.com/NewSub** into your browser and sign up today.

THE AS&U 100

The list of the nation's school districts with the most students continues to be dominated by three states—Texas, Florida and California.

By Mike Kennedy

Are large school districts organizations that can take advantage of economies of scale to operate more efficiently as they educate thousands of children? Or are they oversized operations that are saddled with too many bureaucratic twists and turns to focus effectively on student learning?

Probably some of both, and at the same time. Running a school system can be challenging, as anyone doing so in the time of Covid-19 can attest. As the numbers of students increase, the challenge becomes more daunting. Superintendents in the largest districts often don't last very long—just within the last few months, the top administrators in the nation's three largest districts resigned after brief stints—about three years for each of them.

Regardless of how one views large districts, the facts show that over time, the largest districts are becoming larger.

The 2021 AS&U 100, a compilation of enrollment data from the 2019-20 school year, shows that the 100 largest districts accounted more than 11.1 million students. Twenty-five years earlier, those districts had a little over 9 million students.

The enrollment figures in the AS&U 100 are gathered from fall 2019 data posted online by state education departments and individual districts. Those numbers often differ from those found in federal figures or other sources—in some cases, state numbers will include charter school enrollment in a district's total, but federal numbers do not.

The fall 2019 numbers also do not reflect the situation that arose later in 2019-20 when the Covid-19 virus shut down nearly every school across the nation.

Florida, Texas and California

As has been the case for many years, the list of the largest districts is dominated by three states—Texas, Florida and California. They are the states with the largest populations, according to the 2020 U.S. Census, and they account for 47 of the 100 largest districts—20 in Texas, 15 in Florida and 12 in California. (When the list is expanded to the 200 largest districts, Texas, Florida and California also dominate that part of the list. Texas accounts for 23 districts ranked 101 to 200; California accounts for 13, and Florida 10.)

Whether a district is large enough to appear on the AS&U 100 depends on how districts are formed. In Florida, school districts are countywide entities, so their districts tend to be larger—five of the nation's top 11 districts are in the Sunshine State.

In other areas, districts cover smaller geographical areas—24 of the 50 states do not have any districts among the 100 largest.

From year to year, the roster of the 100 largest districts changes hardly at all. New York City, the nation's largest municipality, is by far the largest public school system with more than 1.1 million students.

But when the numbers are compared with figures from 25 years ago, significant changes can be seen.

- Between 1994 and 2019, 13 of what are now the 100 largest districts doubled their enrollment. The fastest growing of those was the Frisco (Texas) district, which was 29 times larger in 2019-20 than it was in 1994-95. The numbers mushroomed from 2,160 to 62,705 students. It had four schools 1993 and now has more than 70. Among the districts ranked 101st to 200th in size, 20 of them doubled in size from 1994 to 2019.
- Several districts, mostly in large cities, saw their enrollment plummet over the last 25 years. In many cases, they have lost students to charter schools, which were rare in 1994.

Higher Education

At the higher-education level, enrollment is not necessarily controlled by population trends in the vicinity—a college or university can decide to limit or expand enrollment based on its own specific circumstances.

Even before Covid-19 forced an abrupt shift to virtual instruction, many students were turning to online programs to pursue their degrees. In fall 2019, many of the institutions with the largest enrollments are ones that have robust online programs that can attract students without geographical limitations.Western Governors University, based in Salt Lake City, Utah, topped the list with 136,139 students. ■

THE AS&U 100

RANK	DISTRICT	STATE	2019-20 ENROLLMENT	2018-19 ENROLLMENT	PER PUPIL EXPENDITURE (2018-19)	1994-95 ENROLLMENT	25-YEAR % CHANGE
1	New York City	New York	1,131,868	1,126,501	$26,588	1,022,534	10.7%
2	Los Angeles Unified	California	596,937	607,723	$13,247	632,973	-5.7%
3	Chicago	Illinois	347,630	363,954	$14,134	407,241	-14.6%
4	Miami-Dade County	Florida	347,327	350,456	$9,542	321,615	8.0%
5	Clark County	Nevada	331,921	335,333	$8,976	156348	112.3%
6	Broward County	Florida	269,172	270,978	$9,444	199,255	35.1%
7	Hillsborough County	Florida	223,314	220,257	$8,889	138,575	61.2%
8	Houston	Texas	210,061	209,772	$9,595	202,149	3.9%
9	Orange County	Florida	209,890	209,114	$9,641	118,666	76.9%
10	Palm Beach County	Florida	196,331	194,986	$10,161	127,519	54.0%
11	Fairfax County	Virginia	188,940	187,830	$14,932	137,646	37.3%
12	Gwinnett County	Georgia	180,589	179,758	$10,292	80,220	125.1%
13	Hawaii	Hawaii	179,331	179,698	$15,242	183,869	-2.5%
14	Montgomery County	Maryland	165,267	162,680	$16,005	117,082	41.2%
15	Wake County	North Carolina	163,265	160,666	$8,897	76,922	112.2%
16	Dallas	Texas	153,861	155,119	$9,954	145,019	6.1%
17	Charlotte-Mecklenburg County	North Carolina	149,335	147,639	$9,360	86,023	73.6%
18	Prince George's County	Maryland	135,962	132,667	$15,334	118,478	14.8%
19	Philadelphia	Pennsylvania	130,617	132,520	$12,655	208,710	-37.4%
20	Duval County	Florida	130,299	130,245	$9,163	121,362	7.4%
21	San Diego Unified	California	122,916	124,105	$11,416	128,555	-4.4%
22	Cypress-Fairbanks	Texas	117,446	116,512	$8,459	49,364	137.9%
23	Baltimore County	Maryland	115,038	113,814	$14,122	99,231	15.9%
24	Shelby County	Tennessee	113,166	106,377	$11,045	43,843	158.1%
25	Cobb County	Georgia	112,097	111,854	$10,368	80,479	39.3%
26	Northside	Texas	107,817	106,501	$8,870	56,117	92.1%
27	Polk County	Florida	107,696	105,673	$9,632	71,297	51.1%
28	Pinellas County	Florida	99,798	100,987	$9,621	102,170	-2.3%
29	DeKalb County	Georgia	98,800	99,166	$11,802	83,772	17.9%
30	Jefferson County	Kentucky	98,381	98,506	$13,972	93,407	5.3%
31	Lee County	Florida	95,616	94,417	$9,680	49,413	93.5%
32	Fulton County	Georgia	93,897	94,491	$11,619	53,143	76.7%
33	Prince William County	Virginia	92,270	90,876	$11,497	45,675	102.0%
34	Denver	Colorado	92,112	91,998	$11,888	62,773	46.7%
35	Albuquerque	New Mexico	89,553	90,634	$9,031	89,001	0.6%
36	Metro Nashville	Tennessee	85,569	81,407	$11,999	71,574	19.6%
37	Anne Arundel County	Maryland	84,984	83,300	$13,866	70,588	20.4%
38	Jefferson County	Colorado	84,048	84,623	$9,756	84,018	0.0%
39	Loudoun County	Virginia	83,936	82,246	$14,208	18,131	362.9%
40	Katy	Texas	83,423	79,913	$9,347	23,745	251.3%
41	Fort Worth	Texas	82,891	84,510	$9,823	72,332	14.6%
42	Alpine	Utah	81,532	79,748	$6,646	42,014	94.1%
43	Austin	Texas	80,911	80,032	$10,322	73,191	10.5%
44	Baltimore City	Maryland	79,187	79,297	$15,793	113,428	-30.2%
45	Fort Bend	Texas	77,756	76,122	$9,399	43,115	80.3%
46	Greenville County	South Carolina	77,123	76,058	$9,712	54,064	42.7%
47	Pasco County	Florida	76,687	75,059	$8,692	40,114	91.2%
48	Milwaukee	Wisconsin	74,683	75,431	$14,158	98,009	-23.8%
49	Brevard County	Florida	73,962	73,734	$8,841	64,595	14.5%
50	Davis	Utah	72,897	72,263	$7,189	58,112	25.4%

THE AS&U 100

RANK	DISTRICT	STATE	2019-20 ENROLLMENT	2018-19 ENROLLMENT	PER PUPIL EXPENDITURE (2018-19)	1994-95 ENROLLMENT	25-YEAR % CHANGE
51	Fresno Unified	California	73,381	73,249	$13,567	77,023	-4.7%
52	Long Beach Unified	California	72,002	73,221	$12,489	78,127	-7.8%
53	Guilford County	North Carolina	71,878	71,562	$9,609	55,688	29.1%
54	Osceola County	Florida	69,932	68,561	$8,405	24,231	188.6%
55	Virginia Beach	Virginia	68,706	68,624	$11,606	75,926	-9.5%
56	Seminole County	Florida	68,121	68,289	$8,393	53,366	27.6%
57	Washoe County	Nevada	67,856	67,590	$9,294	45,752	48.3%
58	Douglas County	Colorado	67,305	67,591	$9,350	20,041	235.8%
59	Aldine	Texas	67,259	66,854	$10,109	43,818	53.5%
60	Conroe	Texas	64,799	62,837	$8,380	27,534	135.3%
61	North East	Texas	64,539	65,186	$8,993	43,484	48.4%
62	Elk Grove Unified	California	64,480	63,917	$11,515	33,877	90.3%
63	Granite	Utah	63,989	64,281	$8,045	78,590	-18.6%
64	Volusia County	Florida	63,027	63,249	$8,541	55,530	13.5%
65	Frisco	Texas	62,705	60,182	$8,056	2,160	2803.0%
66	Chesterfield County	Virginia	62,669	61,608	$9,886	48,050	30.4%
67	Mesa Unified	Arizona	62,490	62,981	$8,182	69,160	-9.6%
68	Knox County	Tennessee	61,526	59,224	$8,850	52,285	17.7%
69	San Francisco Unified	California	61,031	60,390	$13,640	61,340	-0.5%
70	Arlington	Texas	59,532	59,900	$9,027	50,293	18.4%
71	Howard County	Maryland	58,868	57,907	$15,595	36,125	63.0%
72	Jordan	Utah	56,339	54,865	$6,652	70,761	-20.4%
73	Seattle	Washington	56,206	55,339	$15,014	46,565	20.7%
74	Cherry Creek	Colorado	56,172	55,791	$10,820	34,714	61.8%
75	Garland	Texas	55,701	55,987	$9,272	42,433	31.3%
76	El Paso	Texas	55,253	57,315	$9,693	64,880	-14.8%
77	Winston-Salem/Forsyth County	North Carolina	54,484	53,896	$9,509	39,554	37.7%
78	Clayton County	Georgia	54,424	54,840	$10,472	39,149	39.0%
79	Klein	Texas	54,096	53,328	$9,207	28,762	88.1%
80	Mobile County	Alabama	54,014	53,967	$9,502	64,645	-16.4%
81	Omaha	Nebraska	53,483	53,149	$13,124	43,577	22.7%
82	San Bernardino City Unified	California	53,037	52,773	$13,451	44,250	19.9%
83	Capistrano Unified	California	52,974	53,269	$9,388	33,326	59.0%
84	Pasadena	Texas	52,878	53,291	$10,233	39,189	34.9%
85	Plano	Texas	52,629	53,057	$9,772	36,426	44.5%
86	Corona-Norco Unified	California	52,557	53,002	$11,351	26,877	95.5%
87	Atlanta	Georgia	52,416	52,377	$16,402	59,560	-12.0%
88	Lewisville	Texas	52,189	52,218	$9,786	26,360	98.0%
89	Henrico County	Virginia	51,786	51,523	$9,951	35,934	44.1%
90	Washington, D.C.	District of Columbia	51,036	49,056	$22,759	80,450	-36.6%
91	Round Rock	Texas	50,953	50,387	$8,808	23,942	112.8%
92	Detroit	Michigan	50,895	50,176	$13,071	170,855	-70.2%
93	San Juan Unified	California	50,820	50,509	$11,096	47,080	7.9%
94	Cumberland County	North Carolina	50,750	50,194	$8,989	49,995	1.5%
95	Jefferson Parish	Louisiana	50,566	48,912	$11,519	56,790	-11.0%
96	Forsyth County	Georgia	50,544	49,346	$9,315	9,237	447.2%
97	Boston	Massachusetts	50,480	51,433	$24,177	61,489	-17.9%
98	Santa Ana Unified	California	50,124	51,482	$12,971	48,870	2.6%
99	Manatee County	Florida	50,103	49,310	$9,187	30,864	62.3%
100	Oakland Unified	California	49,588	50,202	$11,195	51,706	-4.1%

THE NEXT AS&U 100

Here are the Next 100—the school districts that ranked 101st to 200th in enrollment in fall 2019. Many of them have spent time on the list of the 100th largest districts, but have seen faster-growing systems pass them by over the years. Others have seen their student numbers steadily rising and are likely to turn up on the AS&U 100 in the coming years.

RANK	SCHOOL DISTRICT	STATE	2019-20 ENROLLMENT	2018-19 ENROLLMENT	PER PUPIL EXPENDITURE (2018-19)	1994-95 ENROLLMENT	25-YEAR % CHANGE
101	Charleston	South Carolina	49,495	48,954	$11,548	44,469	11.3%
102	Wichita	Kansas	49,375	49,953	$11,672	46,002	7.3%
103	Columbus	Ohio	48,738	49,008	$15,461	65,809	-25.9%
104	Portland	Oregon	48,559	48,096	$13,540	54,849	-11.5%
105	San Antonio	Texas	48,532	48,745	$11,750	60,419	-19.7%
106	Collier County	Florida	47,837	47,436	$10,999	25,157	90.2%
107	Socorro	Texas	47,575	46,814	$8,945	18,821	152.8%
108	Rutherford County	Tennessee	47,453	45,579	$8,812	20,873	127.3%
109	Orleans Parish	Louisiana	46,739	46,178	$20,647	86,028	-45.7%
110	Sacramento City Unified	California	46,657	46,933	$12,722	49,282	-5.3%
111	Anchorage	Alaska	46,184	46,734	$14,714	47,655	-3.1%
112	Horry County	South Carolina	45,584	44,896	$10,994	25,253	80.5%
113	Chandler Unified	Arizona	45,523	45,848	$7,561	14,262	219.2%
114	Hamilton County	Tennessee	45,342	44,376	$9,664	24,120	88.0%
115	Killeen	Texas	45,336	44,974	$8,992	27,394	65.5%
116	Alief	Texas	45,300	45,436	$10,228	34,680	30.6%
117	Tucson	Arizona	45,248	45,565	$9,323	62,624	-27.7%
118	Humble	Texas	45,078	43,553	$8,909	21,624	108.5%
119	Lake County	Florida	44,798	43,947	$8,570	23,617	89.7%
120	Frederick County	Maryland	43,828	42,713	$12,974	31,655	38.5%
121	Clovis Unified	California	43,654	43,264	$11,038	28,604	52.6%
122	St. Johns County	Florida	43,644	41,908	$8,394	14,559	199.8%
123	Sarasota County	Florida	43,498	43,119	$11,282	30,431	42.9%
124	Marion County	Florida	43,273	42,941	$9,325	34,020	27.2%
125	United	Texas	43,033	43,364	$9,825	18,528	132.3%

THE NEXT AS&U 100

RANK	SCHOOL DISTRICT	STATE	2019-20 ENROLLMENT	2018-19 ENROLLMENT	PER PUPIL EXPENDITURE (2018-19)	1994-95 ENROLLMENT	25-YEAR % CHANGE
126	Brownsville	Texas	43,028	44,402	$10,210	40,111	7.3%
127	Henry County	Georgia	43,009	42,621	$10,797	14,306	200.6%
128	Cherokee County	Georgia	42,766	42,413	$9,829	19,701	117.1%
129	Oklahoma City	Oklahoma	42,513	44,138	$8,564	39,053	8.9%
130	Clear Creek	Texas	42,388	42,205	$8,530	25,305	67.5%
131	Lincoln	Nebraska	42,258	42,020	$11,367	30,352	39.2%
132	St. Lucie County	Florida	41,875	41,418	$9,120	26,214	59.7%
133	Salem-Keizer	Oregon	41,770	40,946	$11,678	28,863	44.7%
134	Stockton Unified	California	41,679	41,634	$12,022	34,020	22.5%
135	East Baton Rouge Parish	Louisiana	41,637	41,041	$13,634	61,460	-32.3%
136	Union County	North Carolina	41,622	41,285	$8,677	17,591	136.6%
137	Riverside Unified	California	41,617	42,153	$12,332	34,662	20.1%
138	Chesapeake	Virginia	41,597	40,898	$11,544	34,130	21.9%
139	Kern	California	41,451	40,340	$12,847	23,835	73.9%
140	Garden Grove Unified	California	41,423	42,301	$12,765	42,423	-2.4%
141	Williamson County	Tennessee	41,387	39,828	$9,192	14,977	176.3%
142	Leander	Texas	41,381	40,031	$8,543	8,043	414.5%
143	Fayette County	Kentucky	41,249	42,146	$12,855	33,039	24.8%
144	Beaverton	Oregon	41,215	40,439	$11,839	28,035	47.0%
145	Ysleta	Texas	40,428	41,064	$10,095	47,572	-15.0%
146	West Ada	Idaho	40,130	38,990	$6,632	17,676	127.0%
147	Aurora	Colorado	40,088	39,892	$10,183	27,421	46.2%
148	Sweetwater Union	California	39,904	40,364	$12,775	28,867	38.2%
149	Mesquite	Texas	39,856	40,379	$8,782	28,819	38.3%
150	Escambia County	Florida	39,739	39,974	$9,059	44,765	-11.2%

THE NEXT AS&U 100

RANK	SCHOOL DISTRICT	STATE	2019-20 ENROLLMENT	2018-19 ENROLLMENT	PER PUPIL EXPENDITURE (2018-19)	1994-95 ENROLLMENT	25-YEAR % CHANGE
151	Richardson	Texas	39,619	39,108	$8,831	33,651	17.7%
152	Anoka-Hennepin	Minnesota	39,244	38,802	$12,374	38,344	2.3%
153	St. Tammany Parish	Louisiana	38,774	38,542	$12,056	31,405	23.5%
154	Adams 12 Five Star	Colorado	38,707	39,282	$9,474	23,373	65.6%
155	Clay County	Florida	38,691	38,264	$8,155	23,839	62.3%
156	Tulsa	Oklahoma	38,509	39,056	$9,270	40,801	-5.6%
157	Harford County	Maryland	38,429	37,826	$13,237	35,956	6.9%
158	Caddo Parish	Louisiana	37,868	38,598	$11,672	49,609	-23.7%
159	Peoria Unified	Arizona	37,647	37,532	$7,402	25,809	45.9%
160	Savannah-Chatham County	Georgia	37,456	37,576	$11,769	35,442	5.7%
161	Elgin U-46	Illinois	37,443	37,964	$13,286	30,284	23.6%
162	Johnston County	North Carolina	37,192	36,398	$8,780	16,083	131.3%
163	Cleveland	Ohio	37,148	38,000	$18,273	73,803	-49.7%
164	St. Paul	Minnesota	37,010	36,888	$15,564	40,732	-9.1%
165	Berkeley County	South Carolina	36,812	35,794	$9,674	27,410	34.3%
166	Newark	New Jersey	36,676	35,664	$18,878	46,541	-21.2%
167	Corpus Christi	Texas	36,618	37,318	$8,907	41,902	-12.6%
168	Poway Unified	California	36,586	36,450	$11,181	29,152	25.5%
169	Clarksville-Montgomery County	Tennessee	36,577	34,946	$8,823	20,560	77.9%
170	Jefferson County	Alabama	36,458	36,246	$9,262	40,422	-9.8%
171	Irvine Unified	California	36,177	35,291	$10,962	21,944	64.9%
172	Fontana Unified	California	36,160	36,335	$13,064	30,174	19.8%
173	Cincinnati	Ohio	36,024	34,801	$14,336	52,852	-31.8%
174	Mansfield	Texas	35,669	35,293	$8,694	9,773	265.0%
175	Fremont Unified	California	35,431	35,444	$11,018	29,138	21.6%

THE NEXT AS&U 100

RANK	SCHOOL DISTRICT	STATE	2019-20 ENROLLMENT	2018-19 ENROLLMENT	PER PUPIL EXPENDITURE (2018-19)	1994-95 ENROLLMENT	25-YEAR % CHANGE
176	Minneapolis	Minnesota	35,385	35,580	$16,571	45,187	-21.7%
177	Spring	Texas	35,336	35,385	$9,902	19,736	79.0%
178	Keller	Texas	35,267	35,088	$9,108	10,971	221.5%
179	Spring Branch	Texas	35,188	34,681	$9,498	28,442	23.7%
180	Lamar	Texas	35,156	33,444	$9,275	13,531	159.8%
181	DeSoto County	Mississippi	34,752	34,392	$7,368	15,293	127.2%
182	Deer Valley Unified	Arizona	34,556	34,477	$8,069	19,199	80.0%
183	Gilbert Unified	Arizona	34,525	34,226	$7,458	15,440	123.6%
184	Edinburg	Texas	34,327	34,121	$10,185	18,262	88.0%
185	Canyons	Utah	34,178	34,134	$8,237	0	n/a
186	Washington	Utah	33,884	31,074	$7,074	16,550	104.7%
187	Leon County	Florida	33,847	33,978	$8,845	30,494	11.0%
188	Ector County	Texas	33,822	33,268	$8,111	28,161	20.1%
189	Cabarrus County	North Carolina	33,772	33,051	$8,512	15,132	123.2%
190	Irving	Texas	33,544	33,464	$9,545	25,812	30.0%
191	Des Moines	Iowa	33,402	33,623	$12,635	30,781	8.5%
192	Nebo	Utah	33,379	33,117	$6,899	18,330	82.1%
193	Durham	North Carolina	33,319	32,413	$10,821	27,869	19.6%
194	Twin Rivers Unified	California	33,008	31,536	$12,954	0	n/a
195	Weber	Utah	32,975	32,171	$7,232	27,383	20.4%
196	St. Vrain Valley	Colorado	32,855	32,639	$9,659	16,482	99.3%
197	Okaloosa County	Florida	32,461	31,856	$9,065	20,029	62.1%
198	Amarillo	Texas	32,436	32,829	$9,181	29,601	9.6%
199	Pharr-San Juan-Alamo	Texas	32,412	32,682	$10,545	19,994	62.1%
200	Moreno Valley Unified	California	32,299	32,763	$12,732	31,616	2.2%

Higher-education institutions with Largest Enrollment, Fall 2019

RANK	INSTITUTION	LOCATION	FALL 2019 TOTAL STUDENTS	TOTAL STUDENTS FALL 2018
1	Western Governors University	Salt Lake City UT	136,139	121,437
2	Southern New Hampshire University	Manchester NH	113,514	104,068
3	Grand Canyon University	Phoenix AZ	96,211	90,253
4	University of Phoenix-Arizona	Phoenix AZ	94,724	95,777
5	Pennsylvania State University	University Park PA	91,427	46,810
6	Liberty University	Lynchburg VA	85,586	79,152
7	Lone Star College System	The Woodlands TX	74,300	73,499
8	Ivy Tech Community College	Lawrenceburg IN	72,689	72,006
9	University of Central Florida	Orlando FL	69,402	68,475
10	Texas A & M University-College Station	College Station TX	68,726	68,679
11	Ohio State University-Main Campus	Columbus OH	61,391	61,170
12	Florida International University	Miami FL	58,711	57,942
13	University of Maryland Global Campus	Adelphi MD	58,281	60,603
14	Houston Community College	Houston TX	56,151	57,200
15	Arizona State University Campus Immersion	Tempe AZ	53,286	51,585
16	New York University	New York NY	52,885	51,847
17	University of Florida	Gainesville FL	52,407	52,218
18	Northern Virginia Community College	Annandale VA	51,822	50,929
19	Miami Dade College	Miami FL	51,679	54,973
20	University of Illinois Urbana-Champaign	Urbana IL	51,605	49,702
21	University of Minnesota-Twin Cities	Minneapolis MN	51,327	50,943
22	The University of Texas at Austin	Austin TX	51,090	51,832
23	Tarrant County College District	Fort Worth TX	50,519	51,100
24	Rutgers University-New Brunswick	New Brunswick NJ	50,173	50,254
25	Michigan State University	East Lansing MI	49,809	50,351
26	The University of Texas at Arlington	Arlington TX	48,635	47,899
27	Walden University	Minneapolis MN	48,420	50,360
28	University of Southern California	Los Angeles CA	48,321	47,310
29	University of Michigan-Ann Arbor	Ann Arbor MI	48,090	46,716
30	Valencia College	Orlando FL	47,940	46,521
31	University of Washington-Seattle Campus	Seattle WA	47,576	47,400
32	University of Houston	Houston TX	46,148	46,324
33	Purdue University-Main Campus	West Lafayette IN	45,500	44,474
34	American Public University System	Charles Town WV	45,249	46,088
35	Arizona State University Digital Immersion	Tempe AZ	45,073	38,540
36	University of Arizona	Tucson AZ	44,577	44,097
37	University of California-Los Angeles	Los Angeles CA	44,371	44,537
38	University of Wisconsin-Madison	Madison WI	44,257	43,463
39	University of South Florida	Tampa FL	44,246	43,846
40	Indiana University-Bloomington	Bloomington IN	43,260	43,503
41	University of California-Berkeley	Berkeley CA	43,185	42,501
42	Florida State University	Tallahassee FL	42,450	41,269
43	Utah Valley University	Orem UT	41,728	39,931
44	Austin Community College District	Austin TX	41,056	40,799
45	University of Maryland-College Park	College Park MD	40,743	41,200

Re-INVESTigate

Three Tools to Help Your Campus Act Now to Survive in the Future

By Ben Niebauer and Amanda Doenges

Colleges and universities struggle to balance the demand for modern facilities and amenities with the reality of stagnating enrollments. Planning for the long-term costs of maintaining, repairing and eventually retiring infrastructure is vitally import to campus planning and long-term financial health.

In the 1960s and 1970s, colleges and universities invested heavily in new construction, driven primarily by enrollment growth. Similarly, another increase in construction occurred between 2000 and 2015 when institutions focused on expanding programs and amenities.

Now, the need to replace, repair and upgrade these major buildings and systems becomes paramount. Most of these assets will reach the end of their useful life between 2020 and 2035. Managing this risk will become increasingly important in the coming two decades. Without a good strategy, education institutions will face increased costs and the likelihood of equipment failure.

The Cost of Doing Nothing

It's the day before classes, and the labs on the basement level of a building are ready for students. The room is clean and set up for learning.

Then a pipe bursts.

Equipment needs to be saved, and classes need to be reassigned. Emergency fees start to pile up.

When equipment or buildings systems fail, repairs require overtime hours and rush shipments to minimize downtime. Emergency replacement comes with a cost premium and may also create restrictions or additional costs for future facility modifications.

Aside from cost, equipment failure and failing infrastructure can negatively affect operations and a school's image, potentially reducing faculty and student satisfaction.

The cost of doing nothing is much higher than the difficulty of devising a plan.

Facility Asset Management

When the cost of carrying out needed maintenance exceeds the available funding, schools often decide to defer those maintenance projects that are deemed less critical. Facility asset management helps reduce deferred maintenance while optimizing return on investment for campus initiatives.

Facility asset management is a critical process for maintaining buildings and infrastructure, reducing risk, and managing operational costs. Having a strategy to ensure flexible and efficient use of a school's existing space will pay dividends now and for many years to come.

Education institutions can manage assets and reduce risk at various levels, depending on campus size, the age of facilities, staffing and available funding.

Step 1: Understand Your Assets

This stage is typically referred to as the Facility Condition Assessment or Campus Asset Management Plan. Compile a list of all systems on campus, the age of each system, expected life of the system and anticipated cost for repair. Systems should include mechanical, electrical, and plumbing systems, as well as architectural, structural and finishes.

This data will provide an overview of systems that have reached the end of their useful life, as well as the anticipated cost for repair. Planners also may estimate the funding needed to address systems that will be due for replacement in the next five to 10 years.

The campus also may choose to look at Facility Condition Index (FCI), which is calculated by taking the total cost of systems past their useful life divided by the total replacement cost for the building. The FCI can be used to look at the overall condition of a campus over time, as well as provide a comparison between buildings.

The National Association of College and University Business Officers states that an FCI under 0.05 is good, fair is 0.05 to 0.10, and poor is over 0.10. However, a university may choose to determine its own scale for measuring FCI.

Step 2: Prioritize Replacement

Prioritizing replacement and repair projects is critical to a well-run campus. The campus vision and priorities provide a roadmap for investing in the replacement of assets.

Depending on the priorities for a college or university, certain systems or buildings may be given higher priority. For example, if risk to operations mitigation is of highest priority, a single boiler with no backup may have higher priority than replacement of interior doors. Additional factors to consider may include energy efficiency and

Butler University designed a new central chiller plant to support the growing campus, improve temperature control in existing facilities, and increase energy resiliency.

Standards For Success

Properly devised campus-wide design standards create more than continuity. They serve the academic mission, further university branding efforts, and create a visual identity.

Yet institutions often grapple with how robust a set of standards to create.

Robust standards often mean an equally robust review process that cannot keep up with either industry best practices or changing policies on campus. Performance-based standards often ensure effective building systems and provide opportunity for competitive pricing, but they fall short in "branding."

Settling on an appropriate level of rigor for campus design standards is difficult, but these guidelines can assist in establishing this process at your institution.

- **Identify goals & scale:** Where do you want to provide flexibility and creativity? Where do you want specificity and prescribed conditions?
- **Engage facility and maintenance staff:** They know your buildings and grounds better than anyone. They know the headaches and pain points, what will and what won't work. Their voices are invaluable in this process.
- **Seek expert help when needed:** Architecture and design professionals are – in part – paid to keep up on the latest and greatest trends, and will understand the best products, materials and systems to meet your goals. If you are stuck or need additional support, seek expert guidance.

Creating guides, rules and standards will ensure that the institution maintains a consistent and cohesive look and desired performance across the entire campus as facilities and campuses evolve.

utility bill reduction, maintenance costs, space utilization, long-term strategic plans and future renovations.

Step 3: Maintain the Asset Management Database

A school's asset management database is a living document that needs regular maintenance. Administrators must schedule regular progress updates to continually identify and address the next round of deferred maintenance projects.

Ohio University has set up a program in which staff meet once a week to assess buildings on campus. It maintains this schedule so that each building on campus is assessed and updated every five years. During this walk through, maintenance workers can also identify quick fixes and enter work orders to keep their buildings in top-notch condition.

Rethink Space Utilization

"We don't build buildings to sit empty."

This quote came from David Handwork, assistant vice chancellor for facilities at Arkansas State University, and it gets to the heart of the issue. Universities build to create conducive environments for learning, researching, working, dwelling and playing.

But, sometimes we overbuild.

The worst offenders are classrooms and offices. Lecture halls exemplify this. For at least a decade, universities have struggled to retool these spaces to support different modes of learning, only to find that some large classes work better online. Transforming large lecture halls into more highly utilized spaces, such as smaller classrooms or labs, would create more efficient facilities and better support student learning.

Similarly, as academic and administrative departments have grown, so too have their footprints. Universities that shift toward office spaces that promote collaboration and innovation will find themselves ahead of their peers and with less space to manage.

So, how does a university find its version of spatial nirvana? By following these three steps:

- Identify scope and goals
- Analyze the data, but filter through "why"
- Create an actionable roadmap and follow-through

If universities can increase classroom utilization and right-size their workspaces, they will have less infrastructure to build and maintain.

Resiliency Planning

Resiliency planning contributes to the long-term success or sustainability of an organization. This practice identifies potential risks to a campus and then takes steps to anticipate and respond to them.

Step 1 – Conduct a Campus Risk Assessment

First, one must understand what risks a campus is exposed to. For existing campus utilities infrastructure, it could be

Ohio University's facility management team meets once a month to tour buildings on campus for an entire day, allowing them to assess and update their asset management plan on a regular basis. *(Pictured: Ohio University McCracken Hall).*

interruption of service by the utility company. Is backup power available for key buildings? Understand the way utilities are delivered to campus and the potential risks associated with the delivery. Lastly, from a purchasing standpoint, consider the potential long-term costs of utilities and where some of the biggest volumes of service are being purchased.

Step 2 – Analyze, Prioritize & Plan - Infrastructure Master Planning

After a list of risks to campus infrastructure has been identified, overlay the information gathered against the strategic master plan. If a high volume of construction is anticipated on campus, has the planning accounted for the capacity needed to serve future construction? Are key distribution lines situated outside of the footprint of construction sites to reduce the risk of a critical utility line being affected by construction? Use the strategic plan and the risk assessment to develop a long-term infrastructure master plan. This plan will help ensure infrastructure is in place at the appropriate time to support progress and not create hurdles.

Step 3 – Action - Implementation Plan

Once an Infrastructure Master Plan has been created, it is important to develop an implementation plan. On campuses, understanding that a chilled water main needs replacement because of age and inadequate capacity is not sufficient. An implementation plan can take the Infrastructure Master Plan and create tangible projects in a phased and prioritized approach to ensure money is spent at the best time possible to maximize return on investment.

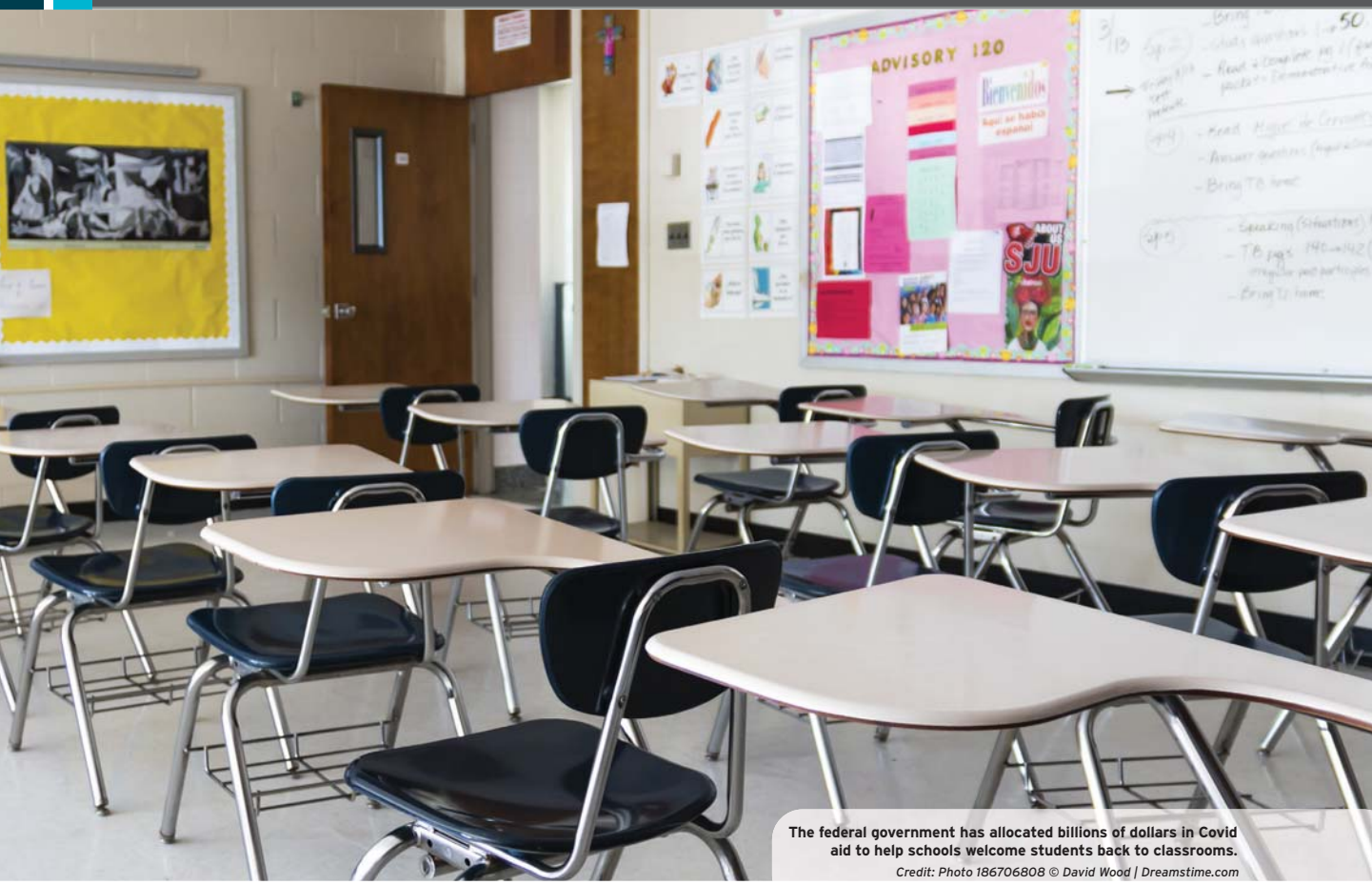
These tools present an opportunity for an administration to be future-minded while acting now to improve the safety and reputation of a campus. Universities and colleges that develop a strong strategy to maintain, repair and eventually retire infrastructure will reduce emergency costs and potential risks to faculty, staff and students. Those education institutions that do not will face increased cost and risk equipment failure that could jeopardize enrollment and the future of the institution. ■

BIO

Ben Niebauer, RA, LEED AP BD+C, Associate Principal + Education Market Leader, leads DesignGroup's education practice. For more than two decades, he has focused on design and planning on over 30 college campus, including medical education facilities, laboratories, housing, athletic facilities, libraries, classroom buildings and dining facilities.

BIO

Amanda Doenges, PE, CEM, LEED AP BD+C, Principal + Education Market Leader, is the Education Market Leader at HEAPY, an engineering design and construction administration firm. She is responsible for strategic master planning, project management, and client satisfaction for both K-12 and higher education projects.



The federal government has allocated billions of dollars in Covid aid to help schools welcome students back to classrooms.

Credit: Photo 186706808 © David Wood | Dreamstime.com

Spending Sensibly

How schools can best use their Covid relief funds, before they expire, to improve facilities.

By Kevin Brown

With all of the relief funding provided to states and school systems in the past year, education institutions nationwide have access to unprecedented resources to help them enhance their learning environments.

But these funds won't last forever.

After funds are allocated toward pre-award costs and debts, remaining dollars must be used to help schools reopen for in-person instruction, respond to health concerns, and support environments that thrive. If these funds aren't used by their deadlines, they'll be revoked.

The quality of education facilities has a significant effect on student performance. By employing more healthful indoor air, better lighting, and eco-friendlier cleaning, school districts can use these funds while supporting student achievement and schoolwide health. Putting these dollars to their best use may feel challenging, but with the right planning, schools and their facility partners can take action to carry out building upgrades that would have been considered unrealistic until recently.

Improved indoor air quality

Recent figures from the National Center for Education Statistics found that the average U.S. school building is 44 years old, and its average functional age (the relative age of the school based on the most recent major renovation) is 19 years.

Yet the average HVAC system has a life expectancy of only 12 to 15 years. This means that schools are relying on inefficient systems beyond their prime. Meanwhile, aging buildings experiencing structural issues and water leakage may be silently contributing airborne allergens like dust and mold to the problem, causing poor air quality that isn't being alleviated.

Between years of deferred maintenance and the resulting compromised conditions of the building and air system, school buildings may be unknowingly circulating unhealthful air or not circulating any air at all.

As schools plan to earmark their funds to address indoor air quality deficiencies, a performance assessment may be a good place to start. Indoor air quality profes-

Many school facilities have inefficient HVAC systems that are operating past their prime. *Credit: Photo 120436369 © Claudiodivizia | Dreamstime.com*

sionals can evaluate a school's risk level by assessing its HVAC control system, air flow, and air quality. They also can assess the temperature regulation problems that could be contributing to poor student achievement.

When classrooms are too hot or too cold, distractions arise and student performance suffers. Studies show that test score averages are higher in classrooms at 72 degrees Fahrenheit than classrooms at 61 or 81 degrees. Putting smart controls into place can help classrooms efficiently maintain comfortable temperatures conducive to learning.

Ideal temperatures are important for boosting concentration, but as far as air quality concerns go, heating and cooling take a back seat to the "V" in HVAC. The right ventilation is key to reducing airborne contaminants and asthma triggers as part of a healthful indoor environment. Stagnant air may cause respiratory problems when debris, pollutants, and contaminants linger in shared spaces. Inadequate ventilation fails to replace poor air with a healthier intake.

Only a sophisticated ventilation system can properly regulate the movement and quality of indoor air; unsealed air ducts or even open windows enable outdoor pollutants to seep in, especially in school facilities with poor outdoor air quality. Modern HVAC solutions can keep harmful air out while filtering in clean air and distributing it evenly and comfortably.

Schools can expand their approach further through a number of advanced disinfection technologies. UV-C lighting can virtually "zap" harmful bacteria out of the air, and dry hydrogen peroxide and needlepoint bipolar ionization can enhance air filtration and attack pathogens directly. Using these approaches with an existing HVAC system makes it easier to eliminate or filter out contaminants in the air.

Greener cleaning and disinfection

A major objective of federal Covid aid is to address the facility shortcomings found in many public schools. Classrooms and children are no strangers to sickness. In every season, germs and illness can spread among students and staff, lowering student performance and driving up administrative costs because of absenteeism. Schools can allocate relief funds to bring advanced cleaning and disinfection to school facilities not only as a pandemic response, but also for the long haul. Ensuring that these cleaning methods are environmentally friendly can help further protect occupant health.

The latest solutions in green cleaning are as effective in reducing and eradicating germs as the cleaners containing volatile organic compounds (VOCs), many of which are carcinogenic. The right natural and non-toxic products won't contribute to side effects like respiratory irritation and asthma.

School buildings can retrofit their lighting layouts and enhance school appearance with efficient lighting design. *Credit: Photo 191463678 © Alexandersr | Dreamstime.com*

With a disinfection program, schools can go beyond routine cleaning to remove and reduce germs from surfaces and objects. Once surfaces are effectively cleaned of top-level debris and dirt, disinfectants can reduce and effectively kill pathogens on high-touch surfaces, providing advanced protection for students and staff. Even if a foreign bacteria or virus akin to Covid-19 is unknowingly brought to school, a thorough disinfection program will provide a better fighting chance to reduce the risk of spread.

Upgraded lighting

Improved learning conditions will help students who have experience learning loss during the pandemic. Inadequate conditions, such as poor lighting in classrooms, may create obstacles to learning. Poorly lighted spaces cause eyestrain and problems with focusing when students need their concentration most. A lack of adequate lighting also may trigger headaches and intensify stress levels, contributing to an environment that's burdensome for students and teachers.

Lighting problems like these may exist for several reasons. Learning environments may be updated without addressing changes in lighting to match (picture a classroom that used to be a storage space). In other cases, a hesitance to upgrade decades-old infrastructure because of cost concerns has forced schools to rely on outdated light sources, despite their higher maintenance costs.

Even when lighting is sufficient, the right type of lighting is equally important to well-being and student achievement. Schools that incorporate more natural

Using Covid relief funds to improve classroom air quality can lead to better student performance.
Credit: Photo 109952969 © Peuceta | Dreamstime.com

lighting into their hallways and classrooms can help create brighter, more optimistic environments.

Replacing exterior walls with large windows might not be feasible for structural and budgetary reasons, but intelligent, modern lighting can easily replicate the spectrum and benefits of natural light. School buildings of all ages can retrofit their lighting layouts and enhance school appearance with efficient lighting design. Long-lasting LED lights offer a more versatile style of light at lower levels of energy use, helping schools maximize student achievement while minimizing maintenance needs and costs.

Energy-efficient LEDs are safe to touch, even when in use. Their glassless bulbs are virtually indestructible, and their long lifespan means less orders from suppliers and less trips up the ladder. Plus, their mechanics don't rely on harmful chemicals or gases, eliminating toxic exposure from the list of possible concerns. These advantages make smart lighting a valuable supplement to a well-ventilated environment.

Advanced Energy infrastructure

To some decision-makers, there's a concern that school budgets won't be able to support the advanced changes made possible with Covid relief funds. Once the money is spent, will the existing budget be large enough to cover the bill on high-powered HVAC systems? If budget concerns are limiting progress (especially while the clock keeps ticking), strategic energy usage can provide some relief. Considering renewable energy enhancements can bring about change that pays for itself.

Even if the installation doesn't not fit the guidelines of use for federal Covid relief funds, schools can use the momentum of this time to invest in additional infrastructure. Renewable energy in the form of solar and wind power can support community goals and provide the low-cost power that advanced learning environments need, without increasing budgets in the process.

Only a sophisticated ventilation system can properly regulate the movement and quality of indoor air; unsealed air ducts or even open windows enable outdoor pollutants to seep in, especially in school facilities with poor outdoor air quality.

As educators and future leaders return to the classroom, prioritizing their health and well-being has never been more vital. It's up to education institutions to make the right call with the resources at their disposal. This window of time is the most opportune to bring about change that would otherwise be difficult to fund. ■

BIO

Kevin Brown is vice president, engineering, at ABM. He is a member of ABM's Expert Advisory Council, which is composed of leading experts in infectious disease, industrial hygiene, and facility services. He serves on the board of the Energy Management Association (EMA) and several technical and standards committees for the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).

FACILITIES EXPO

NORTH TEXAS

OCTOBER 20-21, 2021
ESPORTS STADIUM ARLINGTON & EXPO CENTER
ARLINGTON, TX

NORTHERN CALIFORNIA

OCTOBER 27-28, 2021
SANTA CLARA CONVENTION CENTER
SANTA CLARA, CA

HIGH-INTEREST CONFERENCE SESSIONS

SOLUTION-PACKED PRODUCT & SERVICE EXHIBITOR HALL

NETWORKING LOUNGE

American School&University®

Get more value out of your inbox.

Get more of what you need to stay in the know with valuable insights and timely product news. Sign up today for one of our newsletters.

SCHOOLHOUSE BEAT

The latest education facilities and business news, legislation updates and industry statistics.

FACILITIES FOCUS

A bimonthly best practices on efficiency and improvement.

ASU FIRST MONDAY

Products, equipment and services that help administrators and facility managers do their jobs.

Sign up today at: asumag.com/newsletters/signup

All photos courtesy of New Pig Corporation

Sticking the Landing

Mount St. Mary has found that antimicrobial floor mats in locker rooms eliminate smells, are easy to replace and are more comfortable for players

Adhesive-backed mats can help solve the floor safety puzzle for schools and universities.

By Sherry Vincion

Crafting a plan for safe and secure university campus is like piecing together a 1,000-piece puzzle that becomes more complex as you search for pieces. As campuses evolve, schools add new buildings, establish new procedures, and welcome more people to the decision-making process surrounding upkeep and updates. Indeed, if 2020 taught facility managers anything, it is that the mission can change quickly in unexpected ways.

Even before the pandemic brought a heightened attention to cleaning and sanitizing, universities of all sizes were being stretched thin trying to maintain and secure busy campuses. In fact, a recent study showed that custodial coverage at private higher education institutions alone grew 14% from 2007 to 2016. Each employee now is responsible for more than 35,000 square feet.

Those are the challenges confronted regularly at Mount St. Mary's University, a Catholic university in Emmitsburg, Md., where about 80% of students live on campus and more than 70 student groups meet and hold events. The school also is home to the nation's second-largest Catholic seminary and a national shrine visited by thousands each year. Add in the ever-present hurdles concerning unexpected weather, events and traffic, and there is a large maintenance and safety puzzle for the custodial team.

Like many puzzles, one of the missing pieces was right at our feet. In the past two years, the staff has turned its attention to floor safety and slips, trips and falls. Specifically, the university has begun using a type of floor mat that has resulted in a safer and cleaner campus, happier students and staffers, and sharper-looking facilities.

THE FLOOR SAFETY PUZZLE

Slip-and-fall accidents send roughly 1 million people to emergency rooms every year. Multiply that by an immeasurable factor for the number of people who fall and *don't* go to the hospital. Mount St. Mary's and all higher education facilities aren't immune to these kinds of accidents.

Thousands of students, employees and visitors constantly walk in and out of one of the 26 buildings on the Mount St. Mary's campus. At the same time, their feet are tracking in rainwater, snow, leaves and dirt. Often, students and staff aren't focused on the ground as much as what's on their cell phone. It creates an environment ripe for a slip-and-fall accident.

The most common solution is rubber-backed floor mats. These have been used at entrances to the dining hall, residence halls, common areas, cafeterias, athletic venues, chapel, administration buildings — the list goes on. These mats are meant to soak up and absorb water and dirt from shoes, but they often come create issues that make problems worse.

For example, it can be difficult getting adequate floor coverage in wide or long entranceways. With a standard-sized 3-by-5-foot rubber-backed mat, it's hard to do. After a stride or two, a person has walked off the mat and likely still has wet or dirty feet. The university tried to string together multiple mats, but they moved apart over time, creating an additional trip hazard caused by uneven surfaces that went from mat to floor to mat.

Also, thick rubber-backed mats may create a tripping hazard on their own. The continual foot traffic would raise the lip of the mat, shift it out of place or cause it to bunch up.

The school sought a new way keep floors clean, dry and safe.

COMPLETING THE PUZZLE

Mats provide traction and absorb moisture; Mount St. Mary's also wanted mats that stayed in place, didn't curl and bunch, and were ADA-compliant.

The adhesive-backed mats that the university put into their buildings have made a significant difference in each of the areas where the floor safety program needed to improve.

Doors and Floors

Mats with an adhesive backing and low profile addressed concerns about trip hazards and a lack of coverage in lobbies and other building entrances. These areas were problematic because of the change in surfaces from outside to inside, shoes tracking in moisture, dirt and debris, and even subtle height differences between surfaces. However, once installed, adhesive-backed mats stick firmly to the floor, meaning they won't lift, bunch or shift. Students can step inside without worrying about where they step.

The adhesive-backed mats are able to fit the campus' unique, large spaces in one piece or by laying multiple sections seamlessly together — no more patchwork

The adhesive-backed floor mats installed at Mount St. Mary's University provide a consistent, clean look across the campus.

The adhesive-backed mats are able to fit the campus' unique, large spaces in one piece or by laying multiple sections seamlessly together — no more patchwork solutions.

Mount St. Mary's has installed adhesive-backed floor mats that stay in place, don't curl and bunch, and are ADA-compliant.

solutions. The extra coverage enabled the university to provide longer walk-off sections in heavily traveled spaces or areas that transition between different surfaces. Additionally, the mats provided consistent, clean-looking, uniform matting across the campus.

The low profile of the mats enabled doors to swing over them more easily than thicker mats. The custodial team was able to run the mats up to door thresholds — something not always possible in some locations.

Athletic Venues

Areas beyond lobbies and entrances, particularly locker rooms, benefitted from adhesive-backed matting. The university had been using a hard, plastic grating in these spaces. It kept the school in compliance with health regulations, but they were heavy and difficult to maintain. They were also cold and uncomfortable for athletes' bare feet and, because of water dripping below the grating, prone to a bad smell.

Immediately after Mount St. Mary's replaced the grating with anti-microbial versions of adhesive-backed mats, players and coaches praised the change. The matting was more comfortable for players, eliminated smells, and was quick and easy to replace. The latter part is valuable in a locker room, where blood and sweat frequently drip to the floor and dangerous bacteria may linger.

Common Areas

Students frequently had been using movable rubber-backed mats to prop open doors—letting friends into residence halls or events, moving, bringing in groceries, etc. This created a potential security risk. The adhesive-backed mats are not as easy to move, so people don't use them to prop doors. As a result, the university is spending less time monitoring for open doors or replacing missing mats.

Campus Aesthetics

Some old rubber-backed mats look ugly. Crooked mats or mixed-and-unmatched flooring stand out to people. Adhesive-backed mats can be more aesthetically appealing, creating unbroken along hallways and graphic designs that personalize floors, add directions, or even identify social distancing markers.

MAINTAINING THE PUZZLE

When it came to maintenance, cleaning rubber-backed mats was a physical drain and potential hazard to our staff. With each cleaning, the mats had to be rolled up and moved; some weighed hundreds of pounds when wet, and required multiple staffers and special chemicals to clean and maintain. That added hours of maintenance time per building.

The staff has found adhesive-backed mats much easier to clean. Absorbed water does not seep out, even with heavy foot traffic on a rainy or snowy day. Meanwhile, because the mats have no raised lip and a low profile, custodians can easily run a vacuum or floor scrubber directly over the mat without it budging.

As concerns over campus health and safety grew in the Covid-19 pandemic, adhesive-backed mats filled an important role in Mount St. Mary's maintenance puzzle and enabled the university to focus on keeping students, staff and visitors safe in other ways. ■

BIO

Sherry Vincion is the Custodial Manager at Mount St. Mary's University, a private, liberal arts university in Emmitsburg, MD.

Even before the Covid-19 pandemic, many education facilities were plagued with inadequate ventilation systems.
Credit: Photo 159963380 © Pix569 | Dreamstime.com

A Quest for Air Quality

The Covid-19 pandemic has focused attention on the need for schools and universities to upgrade ventilation systems and improve indoor air quality in their facilities.

By Mike Kennedy

As schools and universities have learned more about Covid-19 and how to combat the spread of the deadly disease, one of the key strategies emphasized by health officials is boosting the air quality in education facilities.

"Improvements in ventilation can help reduce risk of transmission of SARS-CoV-2 and other infectious diseases and improve students' overall health and ability to learn," says a May report, "School Ventilation: A Vital Tool to Reduce Covid-19 Spread," from the Johns Hopkins Center for Health Security.

Improving ventilation will not only bolster schools' ability to ward off the spread of Covid-19, but also provide more healthful learning environments even after the threat of the coronavirus has passed.

"[T]he benefits to investing in healthy air in schools have the potential to outlast the COVID-19 pandemic," the Johns Hopkins report says. "Improved ventilation may give children and school staff healthier indoor air quality for decades in the future, providing a healthier environment for non-pandemic times and potentially reducing risks in future infectious disease outbreaks."

Inadequate ventilation

Even before the pandemic that disrupted in-person learning for millions of students, too many education facilities were plagued with inadequate ventilation systems and poor indoor air quality. A nationwide survey of school districts performed by the Government Accountability Office in June 202 found that 54% of public

school districts needed to update or replace multiple building systems or features in their schools.

And even in schools retrofitted with with new HVAC equipment, air quality still may fall short of standards if a system is not installed and maintained properly.

The Johns Hopkins report cited a study that found problems with HVAC equipment, fan control, or filter maintenance in 51% of classrooms studied.

"The problems that were detected highlight the need for better oversight on HVAC system installation and commissioning to ensure adequate classroom ventilation, as well as the need for periodic testing of ventilation systems and ongoing maintenance checks," the report states.

Those deficiencies in school air quality have far-reaching effects, the report says.

"The EPA has compiled extensive evidence supporting the correlation between indoor air quality and student performance, absenteeism, and even teacher retention," the report says.

Many facility managers may have balked at addressing ventilation deficiencies because, as the Johns Hopkins report noted, "ventilation improvements may often be perceived as a complicated and expensive investment."

Federal funding

Concerns over the expense of ventilation upgrades may hold less weight now that the federal government has earmarked billions of dollars in relief funds to help schools and universities recover from the setbacks they experienced during the pandemic and return to full-time in-person instruction.

In 2020 and 2021, Congress appropriated about $190 billion to the Elementary and Secondary School Emergency Relief Fund for K-12 schools. Another $76 billion was earmarked for colleges and universities through the Higher Education Emergency Relief Fund.

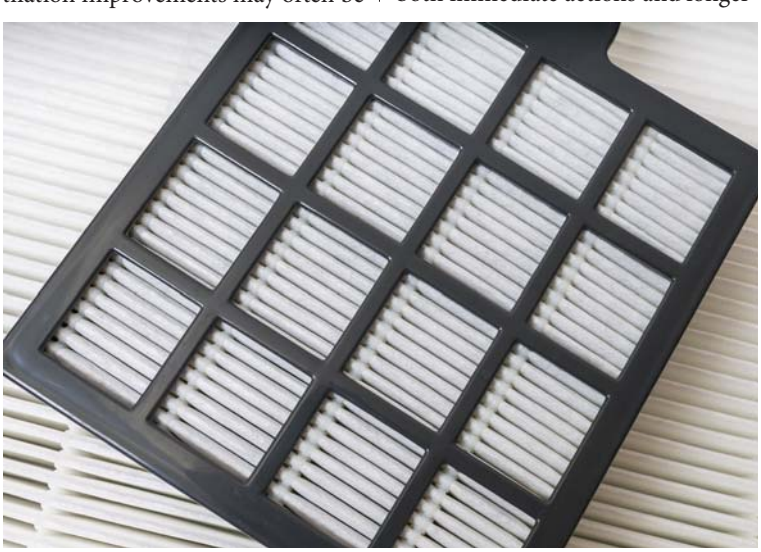
The U.S Department of Education is urging education institutions to use some of that funding to improve the air quality in their facilities.

"As we move into the 2021-2022 school year, ventilation continues to be a top concern for many communities," the Education Department says. "Proper ventilation is a key prevention strategy for maintaining healthy environments and, along with other preventive actions, can reduce the likelihood of spreading disease"

Covid relief funds "can support both immediate actions and longer-term projects, including the inspection, testing, maintenance, repair, replacement, and upgrading of projects to improve indoor air quality in school facilities," the Education Department says. "This can include system upgrades, filtering, purification and other air cleaning, fans, and window and door repair."

The Education Department's guidance specifies many of the ways schools are allowed to use relief funds to improve indoor air quality:

- Inspection, testing, and maintenance of ventilation systems and approaches.
- Buying portable air filtration units, such as HEPA air filters. The Johns Hopkins report urges schools to acquire these units. "Portable HEPA air filters are easy to use, HEPA filtration is a proven technology, and the units have the advantage of being always 'on,' " the report says. "A quiet unit (or combination of smaller units) can increase the number of air changes by at least three to five times in an 800-square-foot classroom, can be purchased for about $500, and are less taxing on electrical systems than a portable air conditioner."
- Buying MERV-13 (or higher) filters for HVAC air conditioning systems.
- Buying fans.
- Repairing windows or doors so that they can open to let fresh air in.
- Servicing or upgrading HVAC systems consistent with industry standards.
- Buying equipment that enables schools to hold outdoor classes.
- Buying carbon dioxide monitors, air flow capture hoods, and anemometers for custodians and building personnel to assess ventilation.
- Paying for increased heating and cooling costs that result from increased use of heating and cooling systems. One of the recommended ways to bring more outdoor air into a school interior is to run the HVAC system for two hours before and after



Schools can use their Covid relief funds to install HEPA air filters that improve air quality.
Credit: Photo 72743179 © Vchalup | Dreamstime.com

Even before the pandemic that disrupted in-person learning for millions of students, too many education facilities were plagued with inadequate ventilation systems and poor indoor air quality.

occupancy. Operating the system those additional hours will cause HVAC costs to rise.

• Other spending that supports inspection, testing, maintenance, repair, replacement, and upgrade projects that improve the indoor air quality in school facilities, including mechanical and non-mechanical heating, ventilation, and air conditioning systems, filtering, purification and other air cleaning, fans, control systems, and window and door repair.

Long-term solutions

The Johns Hopkins report also calls upon the federal government to create a task force to "develop guidance for long-term, sustainable, cost-effective improvements to indoor air quality in schools."

"The well-documented problems of poor indoor air quality in K-12 schools have been allowed to continue for decade," the report says. "A path forward is needed to fix these problems."

The report says the task force should be composed of experts in air quality, industrial hygiene, building science, HVAC systems, epidemiology, engineering, children's environmental health, and education.

"Together, they should develop guidance for improving, monitoring, and maintaining good indoor air quality," the report says. "The task force should create standards for school systems to account for different ventilation systems, climates, and conditions around the country." ■

PVI's Dynamic Water Heating Solutions

With PVI's® Dynamic® Water Heating Solutions, the right-sized commercial water heaters provide optimal balance between BTU input and storage, and feature energy inputs from 199 MBH – 7000 MBH.

https://asumag.com/21162257

Halo™ Swing-Activated Faucet and Eyewash

Bradley's new dual-use Halo™ Swing-Activated Faucet and Eyewash combines access to a faucet and emergency eyewash in one fixture. Perfect for labs, workspaces and classrooms, this space saver provides quick, reliable and convenient access to water.

https://asumag.com/21170379

Classrooms, Common Areas, and Cleaner Air

Look for products that meet aesthetic and performance needs while creating welcoming, inviting environments where students and staff feel safe and inspired. Sustainable solutions that look beautiful, control noise, and help to contain, clean, and protect your school 24 hours a day, 7 days a week. Examine our broad palette of solutions for healthier spaces at armstrongceilings.com/healthyspaces.

https://asumag.com/21171221

Our Powerbond® supports student success.

The many benefits of Tarkett's Powerbond® hybrid resilient sheet flooring include enhanced acoustical control. Easily installed on lecture hall stairs, this innovative surface dampens intrusive sounds—helping students to hear and perform better.

https://asumag.com/21166041

American School&University

MEMBER ORGANIZATION
American Business Media

abm
The Association of Business Information & Media Companies

American School & University (ISSN: 0003-0945) September 2021, Volume 94, Number 1. Published monthly, except for combined issues in January/February and May/June and November/December free to qualified persons in United States, by Endeavor Business Media, 1233 Janesville Ave., Fort Atkinson, WI, 53538 (*endeavorbusinessmedia.com*). Subscription rates: Free and controlled circulation to qualified subscribers. Non-qualified persons may subscribe at the following rates: USA, 1 year, $69, 2 years, $109; Canada: 1 year, $79, 2 years, $139; other international: 1 year, $99, 2 years, $159. For subscriber services or to order single copies, call customer service at (847) 559-7598 or send an email to *americanschool@omeda.com*. Postal/Email List Rentals: Smart Reach *sr-assets@endeavorb2b.com*. Periodicals postage page at Fort Atkinson, WI and additional mailing offices. Canada GTS #R126431964. POSTMASTER: Send address changes to American School & University, P.O. Box 3257, Northbrook, IL 60065-3257 USA. Allow 6 to 8 weeks for change of address.

REPRINTS:
Contact *reprints@endeavorb2b.com* to purchase custom reprints or e-prints of articles appearing in this publication.

ARCHIVES AND MICROFORM:
This magazine is available for research and retrieval of selected archived articles from leading electronic databases and online search services, including Factiva, Lexis-Nexis and Proquest. For microform availability, contact National Archive Publishing Company at 800-21-0600 or 734-761-4700, or search the Serials in Microform listings at *napubco.com*.

PRIVACY POLICY:
Your privacy is a priority to us. For a detailed policy statement about privacy and information dissemination practices related to Endeavor Business Media products, please visit our website at *endeavorbusinessmedia.com*.

ENDEAVOR BUSINESS MEDIA

Director of Sales, Buildings & Construction Group
Joe Agron
941-200-4778
jagron@asumag.com

Account Manager
East & Northeast
Brian Sack
732-629-1949
bsack@endeavorb2b.com

Account Manager
South & West
Randy Jeter
512-263-7280
rjeter@endeavorb2b.com

Account Manager
West & Northwest
Mark Gersten
805-679-7618
mgersten@endeavorb2b.com

Account Manager
Midwest
Bill Boyadjis
973-829-0648
bboyadjis@endeavorb2b.com

Account Manager
Steve Suarez
816-588-7372
ssuarez@endeavorb2b.com

AD INDEX

In most cases, advertisements contained in ASU employment section indicate that the companies are equal opportunity employers. The Federal Civil Rights Act of 1964, and other laws, prohibit discrimination in employment based on race, color, religion, national origin, sex, or for any reason other than lack of professional qualification for the position being offered. It should be noted that employment advertisements in ASU are published for the readers convenience and, in no way, to the best of our knowledge, promote unlawful discrimination.

Rat infestation delays start of classes at California high school

An infestation of rats at a high school in Montebello, Calif., forced officials last month to delay the return of students to campus.

The Los Angeles Times reports that teachers reporting to Schurr High School in August to prepare for resumption of classes found dead rats, rat nests and feces in their classrooms.

The Montebello Unified School District notified parents of the 2,600 students at Schurr that the campus would be closed for "the next couple of weeks."

Interim Superintendent Mark Skvarna said in a letter to the community that four environmental companies were working simultaneously on decontaminating all the buildings on the Schurr campus.

In the meantime, the school was distributing Chromebook computers to students and providing them with instruction via a "modified independent studies model."

In addition to the rat infestation, teachers said the school's air conditioning system was not working properly. Many of the classrooms have no windows.

Photo courtesy of Schurr High School

District officials say they have closed the school largely out of concern that there might be rodent droppings or other health hazards in the HVAC ducts.

Teachers say they have been complaining about rodents, the lack of working air conditioning and other maintenance problems for a long time.

Mold growth means new facilities for Weed, Calif., school

After discovering some of its buildings were contaminated with black mold, the Weed (Calif.) Elementary District is replacing its only campus.

The Mount Shasta Herald reports that the district shut down the campus after workers uncovered mold in the school's main building, quad rooms and music room.

Photo courtesy of Google

Other facility problems include the presence of asbestos and lead paint. In addition, some campus buildings are not seismically sound.

Students in grades three to eight, as well as office staff, have moved temporarily into 16 portable classrooms, situated in two rows now known as "The Avenue."

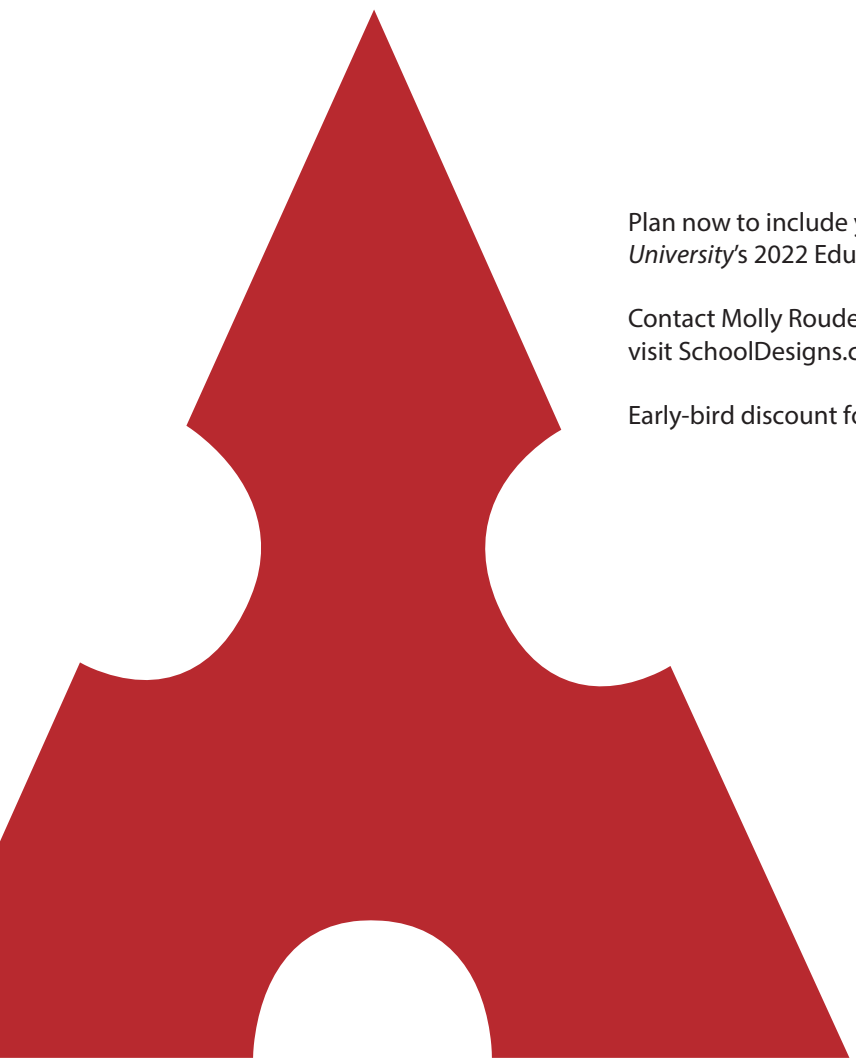
Construction on a new cafeteria and multipurpose room is set to begin soon, and the mold-contaminated buildings will eventually be demolished and a new structure will replace them.

Plans for the new building call for an HVAC system that will provide better ventilation; an outside amphitheater; new separate playgrounds to accommodate different ages; and heated walkways with an overhang for students in snowy weather.

The upgrades are estimated to cost $35.5 million. The district has borrowed $3.5 million to cover part of the cost, and the state of California will contribute $32 million. ■

SAVE THE DATES!

Educational Interiors Showcase 2022



Plan now to include your best projects in *American School & University*'s 2022 Educational Interiors Showcase.

Contact Molly Roudebush at mroudebush@asumag.com or visit SchoolDesigns.com for entry information and deadlines.

Early-bird discount for entry forms received by January 10.

FOR MORE INFORMATION
VISIT SCHOOLDESIGNS.COM

American School&University

www.ASUmag.com • www.SchoolDesigns.com

THERE'S BOOK-SMART.
AND THEN THERE'S ROOF-SMART.

When it comes to your institution, Siplast is the smart choice.

Our SBS-modified bitumen roofs and complementary liquid-applied PMMA systems give you unsurpassed dependability and strength.

So recruit Siplast for your next roof. We're in a class by ourselves.

siplast®

With you every step of the way

Siplast.com