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Enrollment Recovery and Improving Campus Life

This fall, more than 14.8 million students in the U.S. will return to campus for full-time classwork. What this number tells us is that despite the decline in enrollment due to the COVID-19 outbreak, the commitment made by colleges and universities to improve campus life continues to provide impetus at one of the most challenging times for higher education in recent memory. Enrollment decline is steady, and we're even seeing sizeable growth in incoming classes across the country.



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The Science of Safe Laboratories: Understanding Ventilation Systems

Safety First: As the wheels of scientific progress ceaselessly turn, work in laboratories worldwide continues to be dynamic, exciting, and yes, potentially hazardous. In this ever-evolving scientific landscape, the importance of an effective laboratory exhaust system cannot be overstated. For lab managers and facilities personnel, understanding the functionality of these systems and their integration with the broader heating, ventilation, and air conditioning (HVAC) infrastructure is not merely a professional mandate, it's a vital component of risk mitigation.



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Removing Particulates from the Air You Breathe, Smoke Included

Wildfires have emerged from a localized nuisance to an annual problem that affects millions. They generate a wide range of gas phase and particulate contaminants. The smoke composition varies based on the heat and relative completeness of the combustion and the great variety of material that can burn in the path of a wildfire. Wildfire smoke changes rapidly and significantly with time and distance as most gas phase contaminants disperse and larger particulates settle.



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SPOTLIGHT / ON OUR COVER

08 Data-Driven and Community-Oriented Responses to Crime at Seattle University

Jacqueline B. Helfgott, PhD—Professor of Criminal Justice, Criminology, and Forensics, as well as Director of the Crime and Justice Research Center at Seattle University—is an indefatigable researcher, professor, and community partner. She excels in every arena, with a remarkable publishing record and admirable student mentorship agenda, and her multiple initiatives collaborating with the Seattle Police Department are setting nationwide standards for the field of criminal justice.



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FACILITIES & MAINTENANCE

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Editor's Letter

AUGUST 2023

Dear Readers,

As summer comes to an end and the fall semester approaches, there is an undeniable sense of anticipation and excitement in the air. As the editorial team at *Private University Products and News*, we are thrilled to share with you the developments and challenges that private higher education institutions face in providing excellent environments for their students.

The return of students to campus is a momentous occasion for both the academic community and the students themselves. The vibrant energy that emanates from the buzzing corridors and bustling quads is a testament to the resilience and determination of these institutions. However, with the return of students comes the challenge of ensuring that the campus facilities and grounds are equipped to meet the ever-evolving needs of the student body.

Creating and maintaining excellent environments on campus is no small feat. Institutions are investing more than ever in revamping their facilities to accommodate the changing demands of education and student life. State-of-the-art research laboratories, modern libraries, and collaborative learning spaces have become essential components of the higher education landscape. Moreover, institutions are focusing on sustainable and eco-friendly practices to ensure that the campus grounds remain not only aesthetically pleasing but also environmentally responsible.

The challenge extends beyond merely upgrading the physical infrastructure. Ensuring a supportive and inclusive environment that fosters personal growth and academic success is a priority for each institution. Mental health and well-being have gained heightened attention, with counseling services and wellness programs being expanded to offer comprehensive support to students. Creating spaces where students feel safe, heard, and valued is central to the ethos of private higher education institutions.

Private higher education institutions are not just places of learning; they are vibrant communities that foster personal growth and create lifelong connections. These campuses become homes away from home, nurturing intellectual curiosity and instilling a passion for lifelong learning. The holistic development of students remains at the core of every institutions' values, and it is this commitment that sets them apart.

As we celebrate the return of students to campus, we extend our heartfelt appreciation to all the individuals and teams working tirelessly behind the scenes to provide an exceptional environment for learning and personal growth. Let us embrace the new academic year with enthusiasm, resilience, and dedication to excellence.

Wishing all students, faculty, and staff a year filled with new discoveries, meaningful experiences, and cherished memories.

Warmest regards,
Ed Bauer
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Data-Driven and Community-Oriented Responses to Crime at Seattle University

BY CYNTHIA MWENJA, PhD

Jacqueline B. Helfgott, PhD—Professor of Criminal Justice, Criminology, and Forensics, as well as Director of the Crime and Justice Research Center at Seattle University—is an indefatigable researcher, professor, and community partner. She excels in every arena, with a remarkable publishing record and admirable student mentorship agenda, and her multiple initiatives collaborating with the Seattle Police Department are setting nationwide standards for the field of criminal justice.

Career Journey

Helfgott explains that her research goes in two directions: one is the applied research she conducts in service to community partners—often in collaboration with student researchers—and the other is her academic research and teaching in the areas of criminal behavior, psychopathy, and copycat crime. Helfgott’s most recent applied research has been done with the Seattle Police Department (SPD), focusing on community engagement. She has spent much of her career facilitating programs and conducting research in prisons and jails, including a prison art program called Creative Expressions, a restorative Justice program “Citizens, Victims, and Offenders Restoring Justice,” and reentry research following women exiting prison.

While Helfgott has published an astounding array of academic texts—and has served as faculty member at Seattle University for thirty years, including being department chair for sixteen—she had not originally planned to be a professor. In her early life, she knew people who had their lives drastically changed—some of them ended—by violent crime; she also knew people who committed crimes and had experienced the criminal justice

system. These experiences sparked an interest in crime and criminal justice; after earning an undergraduate degree in Society & Justice and Psychology (having initially started out wanting to major in art), she facilitated art programs in prisons for years.

In a visit to Washington State Penitentiary, Helfgott saw Kevin Coe, a serial rapist and psychopath. Her interest in crime was rekindled; she planned to become a prison psychologist and applied to several clinical psychology programs. In response to her application to the clinical psychology program at Penn State, the school let her know that not only was her letter of intent more appropriate for the criminal justice program, but also that the criminal justice program gave her a teaching and research assistantship covering her full tuition. Within the field of criminal justice, she was still able to focus on psychopaths—a psychology topic—in her doctoral research.

Upon graduation, she applied to work at both criminal justice organizations and academic institutions, ultimately landing a position at Seattle University to be close to home—after a short tenure at Montana State University in the Department of Sociology, Criminal Justice,

and Anthropology. In that role, she has worked with the criminal justice system at all levels, drawing students and fellow faculty members into all of the projects she is part of.

Faculty Collaborations

In one of many faculty collaborations, Helfgott worked with Elaine Gunnison—Professor of Criminal Justice, Criminology, and Forensics and Director of the Master of Arts in Criminal Justice program—in collaboration on a re-entry project for women who were released from the Washington Corrections Center for Women at Gig Harbor. The program focused evaluating the Seattle Women’s Reentry initiative program delivered by the IF Project (<https://www.theifproject.org/>) on helping the women to be more successful on release. Helfgott and Gunnison served as Principal Investigator and Co-Investigator on the project, then interviewed the women every month for a year after their discharge from the corrections center. These ongoing assessments allowed the researchers to see how the challenges that the women faced changed over time, thereby helping the program to offer more personalized and targeted support to the women.

In other collaborations, Helfgott and



This fall, Helfgott is teaching an asynchronous, online course called “Murder Movies and Copycat Crime” based on her just released book, *Copycat Crime: How Media, Technology, and Digital Culture Influence Criminal Behavior* (<https://www.bloomsbury.com/us/copycat-crime-9781440864209/>).

PHOTO COURTESY SEATTLE UNIVERSITY

Gunnison conducted research with United States Probation and Pretrial Services and King County Department of Adult and Juvenile Detention examining the impact of community corrections initiatives.

Seattle Police Department Micro-Community Policing Plans

Helfgott has been instrumental in collaborating with the Seattle Police Department to develop, implement, and replicate the SPD Micro-Community Policing Plans, a multi-pronged effort to revolutionize the relationship between the police department and the Seattle community. This community engagement plan, now going into its ninth year, includes multiple components. One component is an annual Seattle Public Safety Survey that goes out to the Seattle public, including both residents and workers who may live elsewhere. The survey is translated into multiple languages, and it is disseminated as widely as possible in a variety of modalities to reach the most stakeholders possible. Another component of the MCPP is virtual community-police dialogues that Helfgott facilitates each week. These dialogues are organized with a frame of restorative practices; they allow members of the police

department and members of the public to discuss the annual survey results and collaborate on responses.

Loren T. Atherley, Director of Performance Analytics and Research and Senior Research Scientist for the Seattle Police Department—as well as an alum of Seattle University’s Master of Arts in Criminal Justice program—focuses on crime and intelligence analysis, along with data engineering and services in his work for the SPD. Within Seattle’s eighty-four square miles, he says, there are fifty-eight neighborhoods. Under the umbrella of the Micro-Community Policing Plans, research assistants from Seattle University work with the captains of the five precincts and can review the data with the captains in real time. These embedded student researchers work within each neighborhood to talk to community members and build relationships; their insights are included in the ongoing policing plans. Because residents may have different concerns about the crime data than the police do, these relationships and insights are crucial to having information flow both ways.

The National Institute of Justice recently recognized the SPD as a model for public safety priorities as it has focused on controlling crime by way of concentrating on community

needs. The Micro-Community Policing Plans will be replicated in Denver beginning this fall; Atherley says that it is becoming a standard metric for approaches to policing across the nation—and Helfgott has been a critical partner in developing the MCPP, administering it, and participating in a continuous process of “understanding what the community expects of the police.”

Crisis Intervention Program

In Helfgott’s work with the SPD’s crisis intervention program, she has been “instrumental in evaluating current offerings and future aims to improve these contacts,” says Daniel Nelson, Interim Assistant Chief of the Seattle Police Department. Helfgott has been a member of the crisis intervention center that was established by the consent decree from the NIJ. Previously, the SPD had a crisis solution center that offered post-arrest, pre-booking options for people with mental illnesses. If those with mental illnesses agreed to engage in the program voluntarily—and they stayed in the program until completion—the charges would not be pressed. This option allowed the SPD to construct a continuum of care and hand these offenders off to partner organizations where they could

be stabilized. The crisis center was underutilized, however, Nelson reports, because of some of the requirements that made otherwise good candidates ineligible for the program. Helfgott secured a graduate student intern who analyzed the arrests and the screen out criteria. The data empowered Nelson to change the screen out criteria to better utilize the program to serve this population. Without Helfgott’s support and the intern’s work, Nelson says, he would not have had the information needed in order to make these data-driven decisions.

Before the Badge

This pre-police academy initiative implemented by Seattle Police Chief Adrian Diaz introduces recruits to the community before they begin training as police officers. Helfgott is serving as principal investigator (with Matt Hickman Seattle University Department of Criminal Justice, Criminology, and Forensics Department Chair as Co-Investigator) to conduct a three-year longitudinal study on its effectiveness.

Helfgott also facilitates a special series of Before the Badge Community-Police Dialogues as part of the MCPP where community members can engage in conversations with the new recruits and recruits can learn about Seattle neighborhoods. Atherley says that it is critical to bring police recruits to this type of discussion so that they can have a foundational understanding of what’s important in the SPD; once they get into the job, they can remember those foundations so that policing becomes about delivering service. Helfgott’s longitudinal study will guide the SPD to build the program into “something sustainable,” says Atherley.

Continuing Mentorship

Helfgott constantly searches for ways that her students can gain research experience, Gunnison notes. The entire criminal justice department at Seattle University hopes to make its students agents of change, Gunnison says, “because you can’t always change systems from the outside.” Helfgott invited student

researchers to serve on research teams for the Before the Badge program, both for the Before the Badge Community-Police Dialogues and the Before the Badge Longitudinal Evaluation. Students also co-write op-eds for the Seattle Police Initiatives. Gunnison says that SUCJ graduates have gone on to become police officers, crime prevention coordinators, crime analysts, intelligence analysts, medico-legal death investigators, and other criminal justice careers and/or have entered doctoral programs, and the applied experiences they get are helpful as they move into any of these roles.

Helfgott continues to collaborate with her students as they move into their careers. Atherley, who considers himself a “pracademic,” or scholar-practitioner, in an embedded academic role at the SPD, says that Helfgott chaired his master’s thesis and they have now been working together for about fifteen years.

Beck Strah, Assistant Professor in the School of Justice Studies at Roger Williams University, says that he met Helfgott at his

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graduate student orientation event, and he later became Helfgott's research assistant. That project looked at Washington State's policy of holding sexually violent predators under "civil commitment," meaning that these inmates continued to be detained after their sentences were served. Through this experience, Strah

learned from Helfgott how to manage a project, present at academic conferences, and develop a book chapter from the work. While Strah had become a corrections officer after graduation, he became increasingly interested in academic work. His ongoing research relationship with Helfgott led him to the doctoral program at

Northeastern, and Helfgott served on his dissertation committee. The two continue to research and publish together, and he is thankful for her continuing advice and mentorship. They are currently working on a book project titled *Criminal Psychology: History, Practice, Research, and the Future* in which Strah has taken on the lead author role.

Embracing TikTok

This fall, Helfgott is teaching an asynchronous, online course called "Murder Movies and Copycat Crime" based on her just released book, *Copycat Crime: How Media, Technology, and Digital Culture Influence Criminal Behavior* (<https://www.bloomsbury.com/us/copycat-crime-9781440864209/>). She has also been fascinated with TikTok since the pandemic. Putting the two ideas together, she is making TikToks on copycat crime cases for the class. The idea germinated when she had students in her psychopath class do case studies, and she mentioned to the students that she was thinking about creating a TikTok account for her Copycat Crime book. One student offered to use TikTok as the platform for her Psychopath case study to show her how it's done. She says that learning to use TikTok—and meet audience expectations—has been a fun learning process.

Renaissance Researcher

In every facet of her work, Helfgott embodies a wide variety of remarkable strengths—strengths that those who know her are quick to highlight. Atherley says that the SPD is "lucky to have Helfgott and her ability to think flexibly." He aspires to emulate her abilities as a "Renaissance researcher"—one who is adept at employing mixed methods and drawing on multiple disciplines, including psychology, sociology, cultural and media studies, and criminal justice. Gunnison appreciates Helfgott's example as "an innovator and trail blazer" who has "always spearheaded efforts for community engagement." Strah calls attention to Helfgott's unsurpassed work ethic as well as her constant attention to helping students reach their own goals. In all of these areas, Helfgott offers both model and inspiration to community-engaged researchers in every field.


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 **ABOUT THE AUTHOR:** Dr. Cynthia Mwenja teaches Composition and Rhetoric at the University of Montevallo.



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FACILITIES & MAINTENANCE

Great Impressions Start with the Restrooms

BY DAN SILVER

As visitors flock to open house weekends, hundreds of potential students and their families are exploring each campus. Many administrators imagine that what will leave the biggest impression is the new student housing, the well-equipped classrooms, and the state-of-the-art sports facilities.

In reality, it's quite likely to be the restrooms. When restrooms are clean, bright, and well-stocked, visitors walk away without giving them a second thought. However, a bad experience in a dirty, odor-filled, or poorly-stocked restroom could trigger viral comments across social media.

Numbers Tell the Tale

The Cascades 2015 U.S. School Restroom Survey revealed that 65% of respondents said that restrooms colored their perception about the overall quality of the school. Additionally, 60% advised prospective students to include restroom quality before deciding to enroll.

On the flip side, a recent study by Bradley Corporation reports that 77% of millennials say that they frequent specific businesses because their restrooms are clean and well-maintained.

What Constitutes a Cringeworthy Restroom?

According to a number of restroom industry surveys and studies, the biggest turnoffs are strong odors, clogged or unflushed toilets, and an overall unkempt, dirty appearance. Lack of soap, paper towels and toilet paper, and wet, slippery floors also rank as major irritations. The Bradley Corporation report also notes that

people will go to extraordinary lengths to avoid contact with dirty surfaces, such as flushing the toilet with their foot, using paper towels to close doors, or hovering over the toilet seat.

The Culprits Behind Most Odors

According to a Harris restroom survey, 83% of adults aged 18-34 say that odor contributes to their perception that the restroom is dirty. Even when the restroom looks clean, lingering odors send the signal that it is not. Where do these odors come from? In men's rooms, the obvious culprit is urine that dries on the floor, leaving material that feeds naturally occurring bacteria. The byproducts of these bacteria create the odors that greet visitors to the restroom. In women's rooms, odors may stem from used diapers or sanitary products in the trash or urine cross contamination from the men's room that occurs when the floors are mopped.

Perpetuating a Bad Situation

That quick mop at the end of the daily cleaning protocol may be doing more harm

than good. Urine that reaches the floor can find its way into hard-to-reach corners and penetrate porous surfaces like grout lines. A few passes with a mop are unlikely to eradicate all of the urine and bacteria on the floor; moreover, wetting the area can essentially reactivate the odor sources by adding moisture that bacteria thrive on.

A Two-Step Approach

To keep odors under control, all restroom surfaces first need to be deep cleaned, especially the floor. It's best to schedule deep cleans during off-peak hours. This timing allows the disinfectants enough time to do their work of killing odor-causing bacteria. The maintenance personnel should be sure to get a good application on porous surfaces like grout lines. After sufficient dwell time, the cleaner should rinse and extract the excess water. How often the restrooms are deep cleaned depends on traffic—and smell. If the restrooms consistently smell

fresh and clean, the deep cleaning schedule is probably adequate.

The second step to odor control is protecting the floor with urinal and restroom mats. Without mats in place to catch drips and splashes around urinals, these fluids end up on the floor and seep into grout lines. They can also be tracked into other areas of the restroom and beyond. A properly placed mat, however, will catch those splashes before they ever hit the floor.

Recent developments in the restroom supply industry have resulted in a new line of antimicrobial urinal and restroom mats. These mats prevent the growth of odor-causing bacteria and mold on the surface, and they have adhesive backings that keep them in place, so they don't shift out of position. In addition to their use near urinals, the mats can also be used in front of sinks and toilets, as well as under hand dryers and towel dispensers to absorb water and prevent the floor from becoming slippery.

continued on next page

In the Cascades Restroom survey, 90% of respondents said that hygiene was important to them and that restrooms are critical to their educational experience. Clean, bright, and well-supplied restrooms across the campus don't just help students stay healthy; they also send a powerful message about the university's concern for their well-being.

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In the Cascades Restroom survey, 90% of respondents said that hygiene was important to them and that restrooms are critical to their educational experience. Clean, bright, and well-supplied restrooms across the campus don't just help students stay healthy; they also send a powerful message about the university's concern for their well-being.

Important Steps to Creating Appealing Restrooms

Inspect and spot clean on a schedule: The best way to keep restrooms up to standard is to check and spot clean them as needed. A minimum cleaning protocol would include wiping down surfaces, removing trash, replacing supplies, and sweeping the floor. Most facilities monitor every hour; depending on traffic and use; during special events, a walk-through may be needed as frequently as every half hour.

Follow a checklist for daily cleaning: Daily cleaning picks up where the spot cleaning leaves off. The checklist should include disinfecting sinks, toilets, urinals, and other surfaces, as well as checking and restocking dispensers, removing trash, and mopping the floor.

Deep clean periodically: Every restroom requires a good scrub to remove soil buildup and residues in places that regular cleaning doesn't touch. Deep cleaning typically includes floors, walls, sinks, toilets, urinals, and stalls, along with vents, fans, and other hard-to-reach areas. It's especially important to treat porous surfaces like grout lines to remove odor-causing materials and bacteria.

Use antimicrobial adhesive-backed restroom mats: Antimicrobial restroom mats prevent odor-causing drips and splashes from reaching the floor. Restroom mats with adhesive backings won't shift out of position, and they stay in place during regular mopping, which cleans their surface and greatly extends

their useful lifespan. In addition to being placed at urinals, these mats can be used in front of sinks and toilets, as well as under hand dryers and towel dispensers to keep water from making the floor slippery.

Upgrade the fixtures: The fewer surfaces people have to touch in a restroom, the happier they are. That's why restrooms with automatic toilets and urinals, faucets and towel dispensers are preferred to those with traditional fixtures. No-touch fixtures keep restrooms cleaner, reduce water consumption, and conserve supplies.



ABOUT THE AUTHOR: Dan Silver has been the Vice President of Product Development at New Pig since 2007, leading an award-winning group that thrives on fast-paced, insight-driven innovation. For more information, visit www.newpig.com.

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Enrollment Recovery and Improving Campus Life

BY DAVID VINSON, PHD

This fall, more than 14.8 million students in the U.S. will return to campus for full-time classwork. What this number tells us is that despite the decline in enrollment due to the COVID-19 outbreak, the commitment made by colleges and universities to improve campus life continues to provide impetus at one of the most challenging times for higher education in recent memory. Enrollment decline is steady, and we're even seeing sizeable growth in incoming classes across the country.



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Several notable developments are aiding enrollment recovery.

Prospective students are taking note, for example, of changes in the admissions process. One of the most significant trends in admissions for 2023 is the continued shift toward test-optimal policies. This trend accelerated in 2020 due to challenges posed by the pandemic, including the logistics of accessing test centers as well as health and safety concerns. While the weight of the pandemic is gradually easing, increasingly more institutions have extended this testing policy, and many have made the test-optimal policy permanent. In fact, 96% of colleges no longer require test scores because they recognize that test scores are hardly the best predictor of college success. Test-optimal and test-free policies likewise reflect a desire to improve educational access and equity, especially for underrepresented students. Another 2023 admissions trend is the continued role of selecting colleges with early action and decision options.

Approximately 50% of applicants now apply early, and colleges fill a significant portion (50-60%) of their incoming class via early decision. Moreover, considering the ongoing discussion around affirmative action and the most recent ruling by the Supreme Court, it is indeed now possible that more colleges will end legacy preferences. Legacy preferences are advantageous to applicants whose family members have attended the same institution, a practice that arguably perpetuates inequality and limits diversity. Colleges are seeking a more holistic review that focuses on personal essays, letters of recommendation, and lists of extracurricular activities to guide their choices among applicants with near identical GPAs or test scores.

Such changes to admissions processes are contributing to enrollment recovery, and yet other factors also play a key role. The quality of education offered will always matter to prospective students, and classrooms are being transformed by technological innovations and new modes of learning that have

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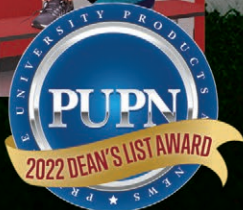
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made knowledge acquisition and sharing more accessible to a diverse range of students. Our campuses are safer, cleaner, and more sustainable than ever. With new or renovated campus recreation and wellness centers, in addition to advances made in student mental health facilities, students have far greater opportunities to enjoy a healthy work/life balance. But none of our efforts to improve campus life would shine so brightly without the governing ethos of creating a community on campus, a home away from home. Integral to this process is applying meticulous attention to enhancing the look and feel of campus spaces, whether indoors or outdoors, in the dorms or the main library, on campus lawns or at an outdoor swimming facility. What the prospective student sees elicits an immediate response, one that has lasting impact. Either they are at ease or not. Campus life is informed by multiple factors and put in motion by careful strategic planning and execution—but if the campus itself does not evoke a sense of place and belonging, we risk losing prospective students regardless of our sizeable efforts.

Carnegie Mellon's Fostering of Community with Seating Solutions

Located five miles from downtown Pittsburgh, Carnegie Mellon's main campus spans over 157 acres between Schenley Park and the neighborhoods of Squirrel Hill, Shadyside, and Oakland. Carnegie Mellon is exemplary in its commitment to creating dynamic, welcoming indoor and outdoor spaces for its students. The institution, like many, has adapted to changes necessitated by time as well as a rotation of students whose needs and desires have evolved. For decades, the center of student campus life was Skibo Hall, the university's student union. Its design was typical of the 1950s, with mid-century modern architecture. However, the space was hardly equipped for the demands marked by a profound technological shift in the dissemination of knowledge. With the rise of computers, the Internet, and a pressing urgency for interconnectivity, Skibo Hall was replaced by the Jared L. Cohon University Center, which has since served as a 24/7 hub for the campus community. The building has undergone several renovations, each representative of students' evolving needs.

Today, it offers spaces for meetings and conferences, special events, recreational and fitness facilities, a pool spectator balcony, locker rooms, a renovated dining facility, and a new entrance way and lobby adorned with a Chihuly glass sculpture. To encourage students to feel at home, it also offers ample spaces for studying and socializing. This building, both inside and out, is precisely the sort that captures the imagination of prospective students while also satisfying, if not exceeding, current students' expectations.

New outdoor seating areas are popping up across Carnegie Mellon's campus. The spaces give students, faculty, and staff a place to pause and reset, to check email, enjoy the weather, or even host small group meetings. It is a simple, cost-effective idea with the lasting effect of bringing people together. Multiple large 20x40-foot tents and fifteen smaller canopies have been

continued on next page

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placed around campus. The tents contain a roof covering, folding chairs, and chair racks for storage, and they're big enough to hold nearly a dozen students each while allowing for social distancing if desired. Staying true to health and safety measures inspired by the pandemic, the tents are cleaned daily with electrostatic sprayers and contain hand-sanitizing stations. Other outdoor spaces have been converted to landing spots for the campus community, as well. Seating areas are available under the vaulted ceilings at the north and south ends of the Purnell Center for the Arts and the Cohon University Center. During the pandemic, stone benches along the tree-lined walkway in the Tepper Quad were used as makeshift coffee tables with a chair at either end.

Carnegie Mellon's Classroom and Learning Spaces Project has updated and redesigned classrooms based on data collected at the University's Eberly Center. The redesigned spaces include new and flexible furnishing, technology upgrades, and better lighting and acoustics to improve classroom function and accessibility. The improvements have allowed for a more pleasurable learning experience, and they offer new options for instructors to enhance student learning through evidence-based strategies such as active learning. Students benefit from single, moveable desks that are easy to arrange at different points in the classroom, and each desk itself can rotate to accommodate left- and right-handed notetaking. This design for flexible use is a vast upgrade over fixed seats with little table space. Moreover, because the desks rotate, they can be turned inward to form a table of sorts, thereby creating spaces for small group work. Instead of the "sage on the stage" model, instructors can now more easily incorporate interactivity, whether pausing for students to discuss a question or allowing groups of varying sizes to gather and work through problems. Versatile furniture facilitates exciting learning modes. Rather than the traditional, inflexible model of instructor to student, now available is the option to adopt flexible and multi-directional learning. In addition to moveable furniture, upgraded classrooms include expanded whiteboards, new AV equipment with enhanced touch panels and document cameras, and larger projection screens. An obvious pedagogical advantage to such improvements is the ability for students to share their work with ease. Whiteboards promote collaboration, and the DocCam allows students to quickly take turns sharing their work on paper with the entire class. Critical to the learning process, new AV systems make frequent practice and feedback a fluid, simple process during class sessions.

Innovative Seating Designs and the Future of Education

Custom seating solutions empower higher education institutions to maximize space, meet sustainability demands, and optimize the functionality of learning spaces for decades to come. Innovative seating designs are a superb recruitment tool, appealing to prospective students who seek versatile, welcoming learning spaces. A helpful means of approaching the relationship between seating and learning is to consider five characteristics

continued on next page



Securing College Dormitories

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THE SCENARIO

After qualifying for an annual security grant from the federal government, administrators at this public college decided to enhance the security at all six of their campus dormitories. There were two dormitories on campus and the other four were located blocks away. Those four buildings were not part of the original college campus. They were purchased after a distance rapidly expanded and more housing was needed. Since there was not enough space to construct additional buildings on campus, buying the buildings offsite was their only option.

Having a mix of dormitories on and off campus presented a challenge. Administrators wanted a method for each student to call a central security office directly from their dorm room. For those students who lived in the buildings off campus, distance could hinder their ability to reach the same security office. They needed a system that could go long distances but would still provide a reliable means for all students to call for help or assistance from any one of the college's dorm buildings where they resided.

Staff also wanted the same system to provide video entry security so students could see and speak with visitors before letting them inside.

THE SOLUTION

To accommodate the varied locations and distances of each dorm building, administrators opted for an IP multi-tenant video intercom.

Each dorm room had an interior tenant station, which gave student residents a safe and easy way to call the security office in case of an emergency. Security staff had a dedicated guard station where they could answer calls and assist accordingly.

All six dormitories had exterior entrance stations with touch-screen panels, which provided the added benefit of visitor screening. The intuitive touchscreen made it easy for visitors to line and students could easily access their own building with an assigned keycode.

In case of an emergency, residents had a safe and easy way to call the security office directly from their dorm room.

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applicable to a future-focused lecture hall, auditorium, or classroom.

First, students and teachers alike want collaborative learning spaces. Reaching this goal entails moving away from individual, forward-facing desks. Take the modern lecture hall, for instance. From subtle radial row configurations to chairs that swing and swivel, collaboration becomes more intuitive, and students can flourish. Second, students and teachers want convenience. One of the most convenient features to add to any new fixed seating installation is USB and power outlets, or what is called wire management. Wire management is an essential add-on feature for seating, whether in the intimate setting of a small classroom or in the larger hub of a lecture hall. Wire management is critical for students who type their notes or record lectures, simultaneously aiding in accessibility needs and putting students at ease when their laptops or mobile devices are low on power. Another convenient feature,

and one frequently overlooked, is tablet arms. Every learning environment should have a surface on which students can work, and this requirement is easily managed by adding a table arm to auditorium seating, adding a stand-alone table, or adding tables to accompany lecture hall seating. Using personal tech devices is not only the cultural norm but also a common requirement in the classroom. Tablet arms seamlessly accommodate these technologies.

Third, occupants of learning spaces want seating that's functional and comfortable but also pleasing to the eye. Those who specialize in creating customizable seating designs can do so with the aesthetic of any campus in mind. Fourth, students are increasingly attracted to campuses that embrace the virtues of sustainability and environmental stewardship. Seating can now integrate recycled materials and renewable resources. Some of these products are even certified Clean Air Gold. And finally, students and

faculty alike are relieved when space is maximized without crowding a room. A space where occupants feel constricted in movement and bombarded by noise hardly represents an ideal learning environment. Such issues can be avoided with seating in a variety of styles that optimize capacity, are aesthetically pleasing, and offer both comfort and functionality. To increase capacity, seating can even be installed along the wall of any room as needed.

Lighting Design and the Smart Classroom

A recent survey reports that 73% of colleges and universities have new construction projects planned for the immediate future. This wave of new construction reflects the need to keep pace in attracting and retaining students, faculty, and staff. The smart classroom is on its way to becoming a standard expectation in higher education. So familiar is the concept that we know precisely what it contains—an innovative array of technology that creates an

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Thankfully, the impact of the pandemic has made us smarter, more resilient, and better at our jobs. We have taken a holistic view of the current landscape and responded in ways that have made our campus communities safer and healthier.

immersive learning experience. But even the most gadget-equipped learning space can fall short of its potential when an element as simple as lighting fails to complement the features of the room. Lighting integration and a well-formulated sequence of operations that supports functionality are often overlooked in the rush to create a competitive learning environment. Poor lighting integration, a lack of personal control of operations, and a weak glare suppression can undermine an otherwise well-planned lecture. With distance learners, the difference between a successful lecture and one that falls flat can be determined by shadowed-out presenters, unfavorable color temperatures, and facial features obscured by glare or shine. The good news: lighting designers know how to make A/V, dimming, lighting color temperature, shading, and furniture configurations work together to best serve the specific demands of the classroom and course.

Higher education has weathered many storms, and the pandemic has been a tsunami and a hurricane rolled into one. The fact that enrollment

numbers have declined is understandable. Thankfully, the impact of the pandemic has made us smarter, more resilient, and better at our jobs. We have taken a holistic view of the current landscape and responded in ways that have made our campus communities safer and healthier. We have also internalized the inherent value of detail. Application processes have been altered, demonstrating a much-needed shift toward further educational access and equity. The classroom, how it looks and functions, has changed. Now we have spaces that are more accessible, more dynamic in the learning modes provided, more comfortable and pleasing on the eye. We are moving in the right direction.



ABOUT THE AUTHOR: Dr. David Vinson has a PhD in English with specializations in transatlantic literature and cultural studies. He is a committed scholar, teacher, and dad. If you ever meet David, avoid the subject of soccer. His fandom borders on the truly obnoxious.

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The Science of Safe Laboratories:

UNDERSTANDING VENTILATION SYSTEMS

BY KASEY FULMER

SAFETY FIRST: As the wheels of scientific progress ceaselessly turn, work in laboratories worldwide continues to be dynamic, exciting, and yes, potentially hazardous. In this ever-evolving scientific landscape, the importance of an effective laboratory exhaust system cannot be overstated. For lab managers and facilities personnel, understanding the functionality of these systems and their integration with the broader heating, ventilation, and air conditioning (HVAC) infrastructure is not merely a professional mandate, it's a vital component of risk mitigation.



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In any laboratory, experiments can produce fumes, particulates, aerosols, or other airborne contaminants. These pollutants can pose significant risks to laboratory personnel and the environment if not adequately contained and removed. Enter the chemical fume hood, a critical part of any laboratory exhaust system, built with the primary aim of safeguarding health and safety.

In any laboratory, experiments can produce fumes, particulates, aerosols, or other airborne contaminants. These pollutants can pose significant risks to laboratory personnel and the environment if not adequately contained and removed. Enter the chemical fume hood, a critical part of any laboratory exhaust system, built with the primary aim of safeguarding health and safety.

Critical Components

A chemical fume hood is an enclosure designed to draw air away from the laboratory space, capturing and exhausting potentially harmful emissions. As an essential component of laboratory safety, its functionality depends heavily on several factors, including directional airflows and air changes per hour (ACH).

Directional airflows are required for controlling the movement of contaminants within a building’s lab. By strategically establishing proper airflow patterns, such as negative pressure zones and unidirectional flows, facilities can effectively contain airborne particles, hazardous gases,

and fumes generated during experiments, redirecting them away from occupied areas. This proactive approach prevents the spread of contaminants throughout the building and minimizes the risk of exposure to lab personnel.

Lab ACH also plays a critical role in ensuring a safe and healthy environment. Higher ACH values can be desirable as they effectively remove airborne contaminants and introduce fresh, clean air. Fume hoods play a crucial role in determining lab ACH, as they typically require a substantial ventilation rate. Leveraging this advantage, fume hoods can help achieve desired ACH values without the need for additional general exhaust equipment. Integrating fume hoods into the lab’s ventilation system also effectively removes contaminants at the source, ensuring the air remains clean and safe for lab occupants.

Understanding and managing these variables is the first step in risk mitigation. A fume hood, however, is only as good as the exhaust system supporting it, which in turn, is part of the larger HVAC infrastructure of the building.

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Integration of the laboratory exhaust system with the building's HVAC system is not only smart, but it is also crucial for optimizing safety, energy efficiency, and operational continuity. When harmoniously integrated, these systems work together and provide multiple advantages.

The Role of HVAC in Lab Safety and Quality

Integration of the laboratory exhaust system with the building's HVAC system is not only smart, but it is also crucial for optimizing safety, energy efficiency, and operational continuity. When harmoniously integrated, these systems work together and provide multiple advantages.

The HVAC system's role in managing the overall building pressure relationships can significantly impact the performance of the fume hood. Negative pressure in the lab, relative to adjoining areas, ensures that air—and any contaminants—flow into the lab, not out of it, when doors are opened. When fume hoods are on and operating, air is pulled through them via a blower, creating a negatively pressurized environment to protect users from harmful vapors. Engineering the mechanisms for proper air exchange and filtration for a lab

as well as the adjacent building spaces is a highly complex undertaking.

Secondly, the HVAC system can help manage the temperature and humidity within the lab. An optimal indoor climate ensures that the performance of the fume hood and the comfort of laboratory personnel are not compromised. Electrical appliances contribute to higher temperatures in the rooms where they are operated; therefore, climate control and ventilation must be monitored and maintained in a perfectly balanced system. Such balance requires an advanced exhaust system that is capable of communicating with building management systems (BMS). This integration enables effective communication and coordination between the exhaust system and the broader infrastructure, ensuring optimal performance and streamlined operations.

Finally, a well harmonized integration facilitates superior energy management.

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Achieving Excellence in Air Quality Management

The secret of creating a harmonious integration lies in the design phase, considering the HVAC system and the laboratory exhaust system in tandem, rather than as separate entities. The inclusion of variable air volume (VAV) controls, for instance, can adjust fume hood exhaust and room supply volumes based on real-time requirements. Likewise, adopting innovative

technologies like predictive analytics and internet of things (IoT) can help monitor and optimize these systems in real-time. Building and facility managers of our nation's universities must carefully consider technology solutions that seamlessly integrate with any BMS. Such integration ensures compatibility and ease of operation, even in those institutions that currently operate indoor airflow without such a system.

Laboratories undergoing renovations and new installations require flexible yet innovative exhaust solutions that are more effective and efficient than ever before. Optimal performance while achieving energy efficiency is possible without cutting corners.

Fume hood selection should focus on critical variables such as face velocity, rate of air going through the fume hood (CFM) and the types of applications to be used.

Rooftop blowers should provide status indicators and diagnostics such as RPM, temperature, and alarm codes; they should

also be flexible enough to accept signals from alternative types of BMS.

The safety and efficiency of a modern laboratory hinge on the effective integration of fume hoods, exhaust systems, and HVAC infrastructure. As stewards of these critical spaces, lab managers and facilities personnel carry the crucial task of understanding, managing, and optimizing these systems. After all, the breadth of safety in a laboratory is as indispensable as the breadth of innovation it fosters.



ABOUT THE AUTHOR: Kasey Fulmer is the product specialist for fume hoods, furniture, and exhausters at Labconco Corporation. Fulmer has worked with architects, lab planners, and individual fume hood operators in his role at Labconco from the initial design phase to installation. He has a Bachelor of Science in Mechanical Engineering from University of Missouri-Kansas City.

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The Air You Breathe, Smoke Included

Wildfires have emerged from a localized nuisance to an annual problem that affects millions. They generate a wide range of gas phase and particulate contaminants. The smoke composition varies based on the heat and relative completeness of the combustion and the great variety of material that can burn in the path of a wildfire. Wildfire smoke changes rapidly and significantly with time and distance as most gas phase contaminants disperse and larger particulates settle. When not immediately near the fire, VOCs have not been found in high concentrations. Weather and wind patterns also play important roles in where and how long the smoke remains.



In general, indoor air quality (IAQ) is directly linked to outdoor air quality. Since most buildings depend on bringing in outdoor air to dilute indoor contaminants and maintain a positive pressure, unacceptably contaminated outdoor air can be a real problem. With the increased incidence of fire, especially at the WUI, the impacts of those fires are felt in more places by more people in more buildings. One of the most noticeable, hazardous, and lingering effects is the generated fine particulate haze that can spread hundreds of miles from the source and impact entire regions. Effectively removing these contaminants from the indoor and outdoor air is critical for both occupants and processes. The first step in dealing with an air quality issue is to determine as specifically as possible what the issue is and which technologies need to be brought to bear to effectively deal with it.

Smoke Composition

Wildfire smoke is a complex mixture of airborne particulate matter (PM), as well as vapors and gases produced by incomplete combustion. These include volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), inorganic gases, and water vapor.

The composition of wildfire emissions is impacted by a wide variety of factors that include the biomass (fuel) conditions, its structure, mass, and moisture content; the ecosystem type; and the fire weather (cumulative temperature, relative humidity, wind speed, and precipitation)—all of which drives fire intensity. Smoke also evolves quickly with time as it diffuses and interacts with atmospheric trace gases and sunlight, undergoing photochemical reactions. The photochemical processing includes the rapid conversion of short-lived reactive trace gases and the production of ozone (O₃) and secondary organic aerosols.

When wildfire perimeters include the WUI, there is additional complexity as the burning fuels can include building materials, consumer products, vehicles, plastics, waste products, and other materials not typically found in the woods.

Particulate Matter (PM)

In terms of outdoor air, airborne particulate is typically discussed in mass/volume v. count/volume. This convention follows industrial hygiene standards which were developed before the advent of laser particle counters, and the nomenclature has survived. There are three standard categories:

PM₁₀ (particles <10 μm—generally referred to as large particle pollution), PM_{2.5} (particles <2.5 μm – generally referred to as small or fine particle pollution), and PM₁ (particles <1 μm – generally referred to as ultra-fine particle pollution). PM from wildfires is comprised of a complex mixture of soot, tars, and organic substances and can be directly emitted from fires or formed through secondary processes that can involve gas phase contaminants. PM_{2.5} and the ultra-fine fraction PM₁ are formed in smoke and within the smoke plume from chemical reactions and physical processes in the plume. The differences in the particle size depend on the type of fuels burned, combustion phase, and aging of the smoke. PM₁₀ particles will settle quickly and are more likely to contain contaminants like heavy metals, whereas fine PM_{2.5} and PM_{1.0} particles stay suspended, carry adsorbed gas phase contaminants, and have significant health impacts.

Fresh smoke particles have been found to be composed of ~50-60% soot and 5-10% black carbon, with count median diameters in

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the range of 0.1-1.6 μm peaking at 1.30 μm and volume median diameters in the range of 2.5-3.0 μm . Another study found biomass burning usually produces fine particles less than 2.5 μm in aerodynamic diameter (PM_{2.5}), with a peak in the size distribution between 0.15 and 0.4 μm . Particulate in this size range will stay suspended for days or weeks and will disperse far more slowly than gas phase contaminants. PM_{2.5} and especially PM₁ will also carry odors, with some gases adsorbed to particles.

Health Impacts

Particle diameter and composition are important factors to consider for health effects, as the size defines where the particles deposit in the lungs, and the composition defines what type of toxic effect they can exert. For example, the soot particle fraction generated by smoldering, incompletely combusted biomass has been reported to contain several known toxins and carcinogenic PAHs.

Exposure to wildfire smoke pollutants has negative impacts on human health, with adverse respiratory, cardiovascular, and cerebrovascular events in the general population. Specifically, PM_{2.5} from wildfire smoke has been strongly associated with respiratory effects (exacerbations of obstructive lung disease, bronchitis, and pneumonia) in several epidemiological studies.

A recent 2021 toxicological study suggested that PM_{2.5} from wildfires is more toxic per unit mass than PM_{2.5} from other sources. Beyond these general health impacts are the IAQ requirements of medical, laboratory, pharmaceutical, and clean manufacturing facilities. Increases in outdoor contaminants will lead directly to increases in indoor contaminants—potentially to unacceptable levels.

Wildfire Smoke Monitoring Case Studies

Wildfires impact the air quality not only in rural and WUI regions adjacent to the fire, but also in urban and suburban areas hundreds or thousands of miles away. The size of emitted smoke particles is wide-ranging: larger particles (> 5.0 μg) are often deposited in the near-field (-1-2 miles), whereas small particles are injected high into the atmosphere and can remain suspended for weeks to months. To address the problem of the impacts of wildfires on IAQ, it is important to know

what contaminants at what levels need to be removed. The following studies are a wealth of information and help to define the problem.

Missoula, Montana Study 2000

A robust air quality study was conducted in Missoula, Montana that coincided with the 2000 wildfire season and the Bitterroot Fire. The year 2000 was the worst fire season in Montana history up until that time (it has been surpassed nine times since). This study monitored PM, and a wide array of VOCs and SVOCs while there were two active wildfires. One fire burned approximately sixty miles south and the second about sixty miles west, resulting in smoke build up in the Missoula Valley. Missoula is the only city completely surrounded by the Rockies, and the Missoula Valley tends to concentrate pollutants. Monitoring was performed at various sites around the valley, some of which were immediately adjacent to active fires.

For the entire month of August, PM_{2.5} concentrations were above the then annual PM_{2.5} ambient air quality standard of 15 $\mu\text{g}/\text{m}^3$. On only two occasions did the monitoring sites exceed the then 24-hour PM_{2.5} standard of 65 $\mu\text{g}/\text{m}^3$. There were two occasions, August 10th and 22nd, 2000, with PM_{2.5} concentrations reaching over 300 $\mu\text{g}/\text{m}^3$ at Hamilton both days and 165 $\mu\text{g}/\text{m}^3$ the 10th at Boyd Park, followed by 83 $\mu\text{g}/\text{m}^3$ on the 22nd.

There were no strong correlations between the VOC level and the active fires, demonstrating that most VOCs generated by the wildfire dissipate and do not stay concentrated or travel long distances in the smoke plume. The most abundant VOCs measured were toluene, benzene, and 1,4-dimethylbenzene, all of which were attributed to gasoline-powered automobile emissions. The study did find that along with PM, there was a large spike of SVOCs measured during the fire season with the prevalence being phenolic compounds: phenol, 2-methylphenol (o-cresol), 4-methylphenol (p-cresol), and 2,4-dimethylphenol.

Rim Fire, California 2013

Another study used measurements from a variety of monitoring sites to collect data about the 2013 Rim Fire in California and Western Nevada. The Rim Fire burned a total of 257,314 acres (402 square miles) and, as of

2016, it was the largest wildfire recorded in the Sierra Nevada Mountain range and third largest in California history.

The study covered fourteen counties that were near the Rim Fire or reported air quality impacts from the fire's smoke. Daily twenty-four-hour average PM_{2.5} concentrations measured by the twenty-two air monitors ranged from 0 to 450 $\mu\text{g}/\text{m}^3$. Rim Fire data shows that not only distance from the fire impacts the PM_{2.5} concentrations, but also the location relative to the fire and the wind direction. Several of the locations over 100 km away had the same or similar PM_{2.5} concentrations compared to sites 10-20 km away.

Monitoring sites in Rim Fire Camp, Tuolumne City, Groveland, Pollock Pines, and Gardnerville experienced the highest mean twenty-four-hour average concentrations of PM_{2.5} (121, 70, 42, 31, 35 $\mu\text{g}/\text{m}^3$ respectively), of which Rim Fire Camp, Tuolumne City, and Groveland were within 20 km from the fire origin. The Rim Fire Camp monitoring site (7 km from the fire origin) reported the highest mean and maximum 24-h average PM_{2.5} concentration (121 and 450 $\mu\text{g}/\text{m}^3$). Carson City also had a high maximum of 170 $\mu\text{g}/\text{m}^3$ even though it was 146 km away from the fire's origin.

Camp Fire, 2018, San Francisco Bay Area Study

In 2018, the San Francisco Bay Area (SFBA) experienced a period of heavy smoke due to the Camp Fire, approximately 150 miles Northeast. During the wildfire, a stagnant weather system trapped the smoke in the Bay Area, increasing ground-level PM concentrations. Passive PM samples were measured at three sites during the wildfire period, and all sites recorded elevated PM_{2.5}, PM_{10-2.5}, and PM₁₀ compared to samples from the non-wildfire period. The mean fraction of submicron PM (PM_{1.0}/PM_{2.5}) was significantly higher during the wildfire period (0.80) compared to the non-wildfire period (0.52).

The submicron particles were dominated by carbonaceous, nearly spherical, single particles 0.15-0.45 μm in diameter, referred to as "tar balls." In contrast, particles collected at the same sites during the non-wildfire period were mostly crustal particles, spores, salts, and vehicle emissions. Over time, these small tar balls agglomerate and form large clusters that are roughly ten times larger than the 0.2 μm

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primary spheroids in typical vehicle emission soot agglomerates. The study concluded that, due to these significant differences in size and composition, the tar balls may be associated with different lung retention and health effects than demonstrated by vehicle-emitted soot health studies.

The SFBA study observed particle size dependence of smoke penetration indoors with an abundance of tar balls in the indoor samples, implying that wildfire tar balls are more likely than coarse wildfire ash to be found indoors. In the study, a house intermittently running active ventilation with MERV 11 furnace filters encountered penetration ratios as high as 0.8 for submicron tar balls (i.e., 80% went through the filter).

**Smoke Mitigation:
Filtration And Improving IAQ**

As shown in the studies above, the primary contaminants of concern from a wildfire are PM2.5 and PM1 (i.e., fines and ultra-fines)

and the potential for elevated SVOCs. These are the contaminants that must be brought down to acceptable levels. There are currently no PM1 or PM2.5 standards or maximums for indoor air concentrations; therefore, the outdoor maximums are typically applied as a minimum target. The National Ambient Air Quality Standard (NAAQS) and the California Ambient Air Quality Standard (CAAQS) have set an annual maximum of 12 µg/m³ PM2.5 for outdoor air, with the NAAQS with the outdoor twenty-four-hour average maximum of 35 µg/m³.

Particulate filters are tested according to ASHRAE standard 52.2 “Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size” and given a minimum efficiency rating value (MERV). Upstream/downstream particle counts are taken in 12 size ranges from 0.3 to 10 µm; these are then put into three groups and averaged: Range 1:- 0.3-1.0 µm; Range 2:- 1.0-3.0 µm; and Range 3:- 3.0 to 10 µm.

A new 2022 ASHRAE guideline “Planning Framework for Protecting Commercial Building Occupants from Smoke During Wildfire Events” recommends upgrading filtration to MERV 13 or higher, especially during smoke events. Additional recommendations include ensuring equipment is well maintained, filters are installed properly and sealed, and buildings maintain positive pressure.

Translating that target of 92-97% efficiency for removing PM2.5 to a MERV rating is a little tricky, as Standard 52.2 uses particle counts (v. mass) and does not look at anything smaller than 0.3 µm. As noted, smoke contains a lot of particles smaller than 0.3 µm. Further, for particles of a given range, there is an inverse relationship between count and weight. For example, in typical atmospheric dust, 95% of the mass is greater than 3.0 µm, but 95% of the count is less than 0.5 µm. Historically, smoke capture systems for power plants, incinerators, restaurants, and casinos have employed some form of active electrostatic

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CHAT WITH
AN EXPERT

Wildfires have emerged as an annual air quality issue for a far greater area than that affected directly by the fires themselves. Poor air quality resulting from wildfires is an issue that must be dealt with for both the people and the processes in buildings.

capture mechanisms versus high-efficiency passive/barrier filtration. The movement, agglomeration, attraction, and capture of ultra-fine particles is greatly influenced by these active mechanisms. Passive filters do not make much use of these; therefore, passive filters of sufficient efficiency to capture ultra-fine particulate are unacceptably airflow-restrictive and have service lives that are too short for most applications.

Gas Phase And Svocs

As found in the studies mentioned above, VOCs are not found at elevated levels, even in close proximity to a fire. SVOCs, however, may linger and attach themselves to small particles and/or become small particles themselves. While the V8 can put a significant dent in moderate levels of VOCs, there are certain buildings that need more precise control. For these, Dynamic EDGE Activated Carbon Panels can provide precise control of gas phase contaminants at extremely low (<0.25" w.g.) pressure drops. These can be installed seasonally or year-round to maximize IAQ.

Conclusions

Wildfires have emerged as an annual air quality issue for a far greater area than that affected directly by the fires themselves. Poor air quality resulting from wildfires is an issue that must be dealt with for both the people and the processes in buildings. Smoke composition can vary greatly due to incomplete combustion and the wide range of material that can burn in the path of a wildfire. The most lingering and critical components of wildfire smoke to remove from the air entering a building, however, are PM1 and PM2.5, due to their potential health impacts. In addition, by removing these particulates from the air, the attached SVOCs and odors are also removed.

ABOUT THE AUTHOR: Published from materials supplied by Dynamic Air Quality Solutions and Caitlin D Naske Lead chemical Engineers. Go to www.dynamicaqs.com to see more information on how Dynamic Air Quality can help you with Air Filtration for your multiple building facilities.

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George Mason University School of Business to Be Named in Honor of Donald G. Costello

A \$50 million planned gift to George Mason University, the largest school-naming gift in the 51-year history of the Northern Virginia-based university, will name its business school in honor of Donald G. Costello. School of Business Dean Ajay Vinzé announced the gift at the launch of Mason Now: Power the Possible, the university's \$1 billion comprehensive campaign.

"It is fitting that we announce this transformational gift at the launch of the Mason Now campaign," said Mason President Gregory Washington. "As the most innovative university in Virginia, Mason leads the way in creating new academic programs to meet the evolving needs of the 21st-century economy. Mr. Costello's success is a testament to his hard work, tenacity, and steadfastness—the same qualities we seek to instill in our students."

The gift, which will establish the Donald G. Costello School of Business, reflects Mason Now's fundraising priorities: student success, research, innovation, community, and sustainability. The School of Business is taking steps to begin its transition and expects to officially adopt the new name later this year. The planned gift establishes an endowment that will provide scholarships to undergraduate and graduate School of Business students to help prepare them for successful careers as entrepreneurs.

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"This gift is a game-changer for the business school and the region," Vinzé said. "We are deeply grateful to Joseph Contrucci, Trustee of the Donald G. Costello Trust, and Mr. Costello's daughter, Sara Costello, for their confidence in our ability to extend the legacy of a forward-thinking entrepreneur whose creativity, hard work, and determination changed the lives of people around him."

Donald G. Costello was born May 31, 1942, in Leesburg, Virginia. He graduated from Loudoun County High School in 1960 and trained as a forward observer in the U.S. Army. In 1976, he and a partner founded Century Stair Company, which grew to become the largest stair manufacturer on the East Coast. He died on July 21, 2017. "Don and I have always seen George Mason University and its School of Business as a catalyst in fueling the Northern Virginia economy," Joseph Contrucci said. "This gift will further that impact by creating career opportunities and new businesses for decades to come."

Entrepreneurship and innovation at Mason are at the center of the School of Business strategic plan. The school's Center for Innovation and Entrepreneurship works with area entrepreneurs, city and civic leaders, businesses, and other colleges and universities to explore business partnerships and entrepreneurial training opportunities to benefit underserved youth.

The School of Business was founded in 1977 and currently enrolls more than 4,600 undergraduate and 650 graduate students, making it the second largest business school among public universities in Virginia.

With a growing physical presence that includes three campuses in Northern Virginia, Mason continues to drive economic growth in a region that extends beyond its host counties of Arlington, Fairfax, and Prince William to the Washington, D.C., metropolitan area and the Commonwealth of Virginia. The Mason Now campaign will support that growth and enhance the university's ongoing commitment to educational access, innovative research, and impactful community engagement.

About George Mason University: George Mason University is Virginia's largest public research university. Located near Washington, D.C., Mason enrolls nearly 40,000 students from 130 countries and all 50 states. Mason has grown rapidly over the last half-century and is recognized for its innovation and entrepreneurship, remarkable diversity, and commitment to accessibility. In 2023, the university launched Mason Now: Power the Possible, a \$1 billion comprehensive campaign to support student success, research, innovation, community, and sustainability. Learn more at www.gmu.edu.

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University Joins Silicon Ranch, NES, TVA to “Flip the Switch” on Vanderbilt I Solar Farm

Vanderbilt University joined Silicon Ranch Corporation, Nashville Electric Service, and Tennessee Valley Authority on April 11 to “flip the switch” on the Vanderbilt I Solar Farm, a 35-megawatt solar facility in Bedford County, Tennessee.

The solar facility is a significant step by Vanderbilt toward the ambitious goal it announced in 2019 to power its campus entirely through renewable energy and become carbon neutral by 2050. The renewable energy generated from the Vanderbilt I Solar Farm will offset approximately 70% of the university’s annual

The solar facility is a significant step by Vanderbilt toward the ambitious goal it announced in 2019 to power its campus entirely through renewable energy and become carbon neutral by 2050. The renewable energy generated from the Vanderbilt I Solar Farm will offset approximately 70% of the university’s annual indirect greenhouse gas emissions from electricity purchased through Nashville Electric Service, or the equivalent of enough power to help serve more than 6,000 homes for one year.

indirect greenhouse gas emissions from electricity purchased through Nashville Electric Service, or the equivalent of enough power to help serve more than 6,000 homes for one year. A planned second solar farm in Moore County, Tennessee, is projected to supply enough renewable energy to mitigate the remaining 30% of emissions.

“The Vanderbilt I Solar Farm not only represents a major step toward our own goals at Vanderbilt, but also provides a model of collaborative, forward-thinking solutions that we hope other organizations will adopt and replicate across this country,” Chancellor Daniel Diermeier said. “We look forward to the educational and research opportunities this project and our pursuit of carbon neutrality will yield for our faculty and students at Vanderbilt. We thank Silicon Ranch, NES, and TVA for supporting us on this bold journey. We also want to express our profound gratitude to our partners in Bedford County. Without the cooperation of our policymakers at the local, state, and federal level who have partnered with the university in support of our sustainability initiatives, this kind of vital work would never be possible.”

Nashville-based Silicon Ranch, one of the nation’s largest independent power producers and a community-focused renewable energy company, developed and

funded the project and hired more than 250 craft workers to build the solar facility. The company also will serve as the long-term owner and operator, a disciplined approach Silicon Ranch takes with every project it develops.

“The Vanderbilt I Solar Farm demonstrates what is possible when we work together with a shared vision for the region, and Silicon Ranch is grateful to Vanderbilt for its leadership and to TVA for its strong support of this meaningful renewable energy investment in Bedford County,” said Matt Kisber, co-founder and chairman of Silicon Ranch. “I am a proud alumnus of Vanderbilt, as are many of our colleagues, and we are thrilled to dedicate this meaningful project today. We also wish to thank the leadership of Bedford County and the Shelbyville-Bedford Partnership for their collaboration and for welcoming us into this community.”

First announced in 2020, the Vanderbilt I Solar Farm is the result of a landmark agreement as the first project contracted under TVA’s nationally recognized Green Invest program, which matches demand for green power from diverse commercial, industrial, and institutional customers with new utility-scale solar projects in the Tennessee Valley.

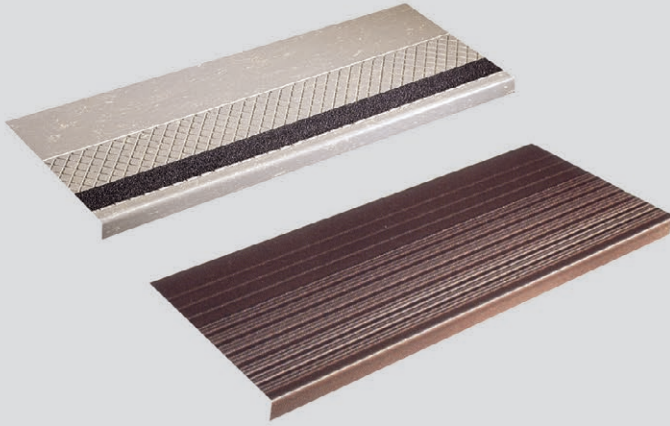
As both the landowner and operator, Silicon Ranch will remain invested in and committed to the continued success and economic viability of the surrounding community. The company invested more than \$50 million to install the Vanderbilt I Solar Farm; over the years to come, the project will generate millions of dollars in new tax revenue for Bedford County to support local infrastructure and schools, among other community-identified priorities. In 2022, Silicon Ranch also donated thirty acres of its project site to the city of Shelbyville and Bedford County to support the recruitment of Duksan Electera America Incorporated, which is investing \$95 million to build its first manufacturing facility in North America, creating more than one hundred jobs.

“This solar farm is a success story on so many different levels,” said Eric Kopstain, vice chancellor for administration. “Not only is it helping Vanderbilt achieve its sustainability goals, it’s also an opportunity—thanks to Silicon Ranch, TVA and NES—to produce meaningful environmental and economic outcomes for our neighbors in Bedford County and the wider Middle Tennessee region. That’s radical collaboration at its finest—bringing our different perspectives together to accomplish not just one goal, but many.”

To learn more about Green Invest and Vanderbilt’s other sustainability efforts, visit vanderbilt.edu/sustainability.

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