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Reimagining Performing Arts Centers After COVID's Curtain Call

By: Payam Ashtiani and Todd Hensley

Principles for keeping theatres and concert halls safe for the long run

The pandemic has hit the entertainment industry hard. The cancelations of live events means concert halls and performing arts venues around the world have been silenced. The return to live, in-person entertainment is hard to imagine in an age of social distancing. Performance spaces are designed to operate at high occupancy with people gathered in close quarters. Such buildings were not designed to operate under pandemic scenarios, and facilities that cannot offer social distancing have limited use.

The entertainment industry has had to pivot to survive. From porch performances in Toronto to spontaneous choirs on Italian balconies, we have seen outdoor spaces unexpectedly transformed into makeshift stages. Many have found creative ways to stay relevant by delivering entertainment online, bringing levity in an otherwise dark and isolating time. Artists have generated thousands of views by performing online at a safe distance. While the online world has helped artists and audiences stay connected, it can't replicate the concert hall or performance venue experience.

A survey by the trade organization Music Canada found that three in ten people watched a live music show on Facebook or another social media platform. While most were satisfied with the experience, those defined as "live music lovers" felt overwhelmingly (84%) that digital content could not replace a live performance.

We have to start reimagining how a performing arts center looks and feels. Many new proposals are requesting designs for buildings that address contagion risk. Diehard audience members will return, but many may be uncomfortable with maskless crowds in tight quarters. The return to full houses and packed theatres may take longer than we think.

Each week brings new developments about the virus, vaccines, and variants. As people return, audiences will need to be assured events are safe. Audiences need to feel comfortable and confident that they are safe in a theatre. Many elements of COVID safety may endure in new designs, including clear wayfinding and paths that mitigate crowded conditions.

photo courtesy Palace Theatre

Palace Theatre, St. Paul Minnesota. The return to live, in-person entertainment is hard to imagine in an age of social distancing. Performance spaces are designed to operate at high occupancy with people gathered in close quarters.

Designing safer venues

Existing performance venues may be able to safely reopen by limiting attendance, instituting temperature checks, and other preventative measures. For all new builds, there is an increase of proposal requests around designing pandemic-aware facilities. Some clients want to re-examine the full layouts of their theatres. Others want to explore flexible spaces in lieu of fixed-form theatres. From reducing capacity to Plexiglas dividers to removing blocks of seats, theatres and venues are experimenting with possibilities. This is not a case of one-size-fits all. Each venue needs to be evaluated because any design changes can have significant acoustical implications.

There are lessons learned that can inform the design of a new performance venue so if another pandemic occurs, the space is well-equipped to operate safely without compromising acoustics:

Don't remove seats. Efficient, but comfortable, audience seating is designed to provide 9 to 10 sq. ft. per patron, far below the 6' x 6' area recommended for social distancing. Spreading audiences that far apart might impact the communal enjoyment, but it is necessary to reassure patrons. Sitting farther apart by removing seats may seem like the obvious option. But seats play a major role in the acoustic design. Plush seating can absorb sound at levels similar to people sitting in hard seating. Rather than remove seats, leave spaces between people to avoid affecting the acoustics. Small box or gallery areas can also be added to help spread out the audience while maintaining a sense of a unified group.

Avoid removing soft surfaces. It may be tempting to design the space with materials that can be easily wiped down and sanitized. But the plush materials used in most theatre seating are not just comfortable; they absorb sound in the acoustical environment. If the venue has hard seating, the acoustics will change dramatically based on the occupancy rate and, consequently, creative solutions may be required to bring back that acoustic absorption to the space. If a facility opts to transition to non-porous materials, it will impact acoustics and would need to be accounted for in other aspects of the design.

Consider the airflow and exchange. HVAC systems will need to allow for much higher ventilation rates, which could lead to noisier airflow. Slower air movement is preferable in a performance space because it is quieter and provides good return for energy management and patron comfort. In a theatre, the design either supplies air from the top, to fall down on the audience, or it sends air from the bottom with a displacement system, so the air rises up. In post-pandemic design, the preference is air supplied from the bottom. This will carry any airborne aerosols up and away from other audience members rather than blowing it down toward them. This would have to be analyzed at a level of detail not conducted before. Computational Fluid Dynamic (CFD) modeling, which demonstrates the movement of air in far greater detail than traditional mechanical design, can determine the best approach to mitigate airborne contagion through the direction of the airflow. Other considerations are bipolar ionization and UV-C light treatments in HVAC systems. These can inactivate the virus, but their application must be optimized to attack at the right location near the patrons before the aerosols are spread. Room-wide UV-C light treatments are being explored, but their application must balance the risk presented by the light source to people and to contacted surfaces.

Increase ingress and egress space for better traffic flow. Dr. Erin Bromage, of the University of Massachusetts Dartmouth, reminds us that infection risk increases through increased proximity and time. How many of us have spent 10—12 minutes in a crowded lobby during a post-show exit? This could cause anxiety in some audience members. Larger lobbies, with more distinct traffic paths and added post-show exits, could relieve fears, and reduce risk. Clear signage and wayfinding tools can aid in this design. Automated door openers are the expectation. These improvements should extend to service areas, concession areas, and washrooms. Also, consider staggering arrival and departure times for the audience to minimize congestion.

Be careful spacing out the orchestra. For musicians, being spaced farther apart makes it harder to perform. For members of an orchestra, close proximity allows them to hear each other better and play in unison. If they are spaced apart, the extra time for sound to travel back and forth may cause delays. This puts more pressure on the stage acoustics to support musicians. Possible solutions include in-ear monitors, which are common in amplified venues. The musicians will also have to rely more on conductor visual cues than their ears.

Protect back-of-house teams. While there is a tremendous focus on protecting the audience, the back-of-house team is equally important. Cast and crew need to be safe. The dressing rooms and backstage area need proper ventilation and filtration and possible UV disinfection of the air. More interior air changes and stronger filtering are recommended.

Be careful when covering up. Face masks muffle speech, so the impact on singing will be more significant. Similarly, the industry has been experimenting with fabric coverings for wind instruments to limit aerosol spread. This is an evolving space where many are testing out different types of coverings that effectively reduce aerosols without deadening sound. The alternative of using Plexiglas dividers could have a significant effect on hearing other musicians and playing in ensembles. And it could make things even louder for the wind players with the trapped sound built up in their area. Hearing loss is already an issue for all musicians but especially for orchestral musicians and this could make that worse.

Cincinnati Shakespeare Company lobby. Better traffic flow will help to ease the anxieties of patrons caught in crowds.

McAllen Performing Arts Center, McAllen, Texas. One approach to crowded auditoriums may involve separating audience members more while keeping seats in place to help absorb sound.

Make broadcasts an immersive experience. The first wave of the pandemic drove livestreamed performances. An industry that thrives on gathering has moved to the next best available format. This is not a cure, nor is it a permanent answer. Instead, it seeks to retain relevance and connection to audiences. Producing companies will remember how enhanced video capture tools have been extremely useful in bringing a semblance of their work to their patrons. Clients are now investing in permanent systems to record and back up their live productions or to stream them live. But, for many, these performances lack the presence and engagement of being live. Knowing the audience will be slow to return, it is critical that we find creative ways to emulate the concert experience. This can be accomplished by streaming binaural sound, which lets the listener experience a 3D stereo sensation. To do this, viewers would purchase a seat but would experience the show remotely. Predesigned binaural microphones at the respective seat levels would stream to the patron's headphones so they can experience the sound as if they were sitting in those particular seats. This model could improve revenue streams since there is no limit in how many tickets are sold and the listener can be anywhere in the world. Adding the option for visual elements for a virtual reality (VR) experience could take engagement even further.

Incorporate an outdoor space in the design. With audiences considering the safety of being outdoors versus indoors, there may be greater interest in moving performances outdoors. Tanglewood Music Center in Massachusetts is shaped like a giant barn opening to an exterior green. In Hamilton, Ontario, a downtown six-story concrete parkade is set to be repurposed as a rooftop concert venue. Companies such as Berkshire Theatre Group, Glimmerglass Opera, and the Stratford Festival are planning outdoor seasons while The Old Globe Theatre and Santa Fe Opera are capitalizing on their outdoor venues. Consider designing a performance arts center that has an outdoor area or has the ability to open up one so a few guests can be seated indoors with performers and others can listen from outside. Consideration should be given to protecting patrons from rain, wind, or snow or external sources of noise such as fire trucks that could disrupt the show.

Go touchless. Patrons are used to touchless payments, electronic ticketing is on the rise, and most of us are comfortable scanning a QR code to access forms or questionnaires. These touchless elements can be expanded through the lobby and backstage, so that fewer items exchange hands during a night at the theatre.

The impact of this pandemic will not be forgotten quickly. While this is probably a once-in-a-lifetime event, it is not the first time the industry has been shuttered. Theatres bounced back following the plague in the 1600s, the Spanish Flu in 1918, and SARS in 2003. If history is any indication, the industry will persevere and rebound from COVID-19 as well.

Payam Ashtiani, a principal with Aercoustics Engineering, has collaborated with a broad range of design teams in the design of theatres, performance halls, and critical listening spaces across Canada. He's constantly looking for innovation in his areas of practice and is an avid classical guitarist.

Todd Hensley, FASTC, a partner with Schuler Shook Theatre Planners, has collaborated with major acoustics consultants for concert halls and theatres in North America and Australia. He is also an occasional vocalist at the weddings of his closest friends.

Left photo: Brade Feinknopf; Right photo courtesy Mcallen Performing Arts Center