

ASSOCIATION FOR
**LEARNING
ENVIRONMENTS**

CHICAGO

Learning SCAPES 2023

BRIAN REGAN
APRIL 7

A Collaboration of Education Thought Leaders Collaborating on the Future of Healthy School Environments

Will Anderson, Richland Two Schools
Jonathan Stanley, Tarkett



Agenda

2022 Healthy Building Summit

Why Have a Summit

Who is involved

Super Session Focus

Output

What are your hurdles, path forward, and who needs to know






Healthy Building Summit 2023

education





**“Collaboration allows us to know
more than we are capable of
knowing by ourselves”
-Paul Solarz**

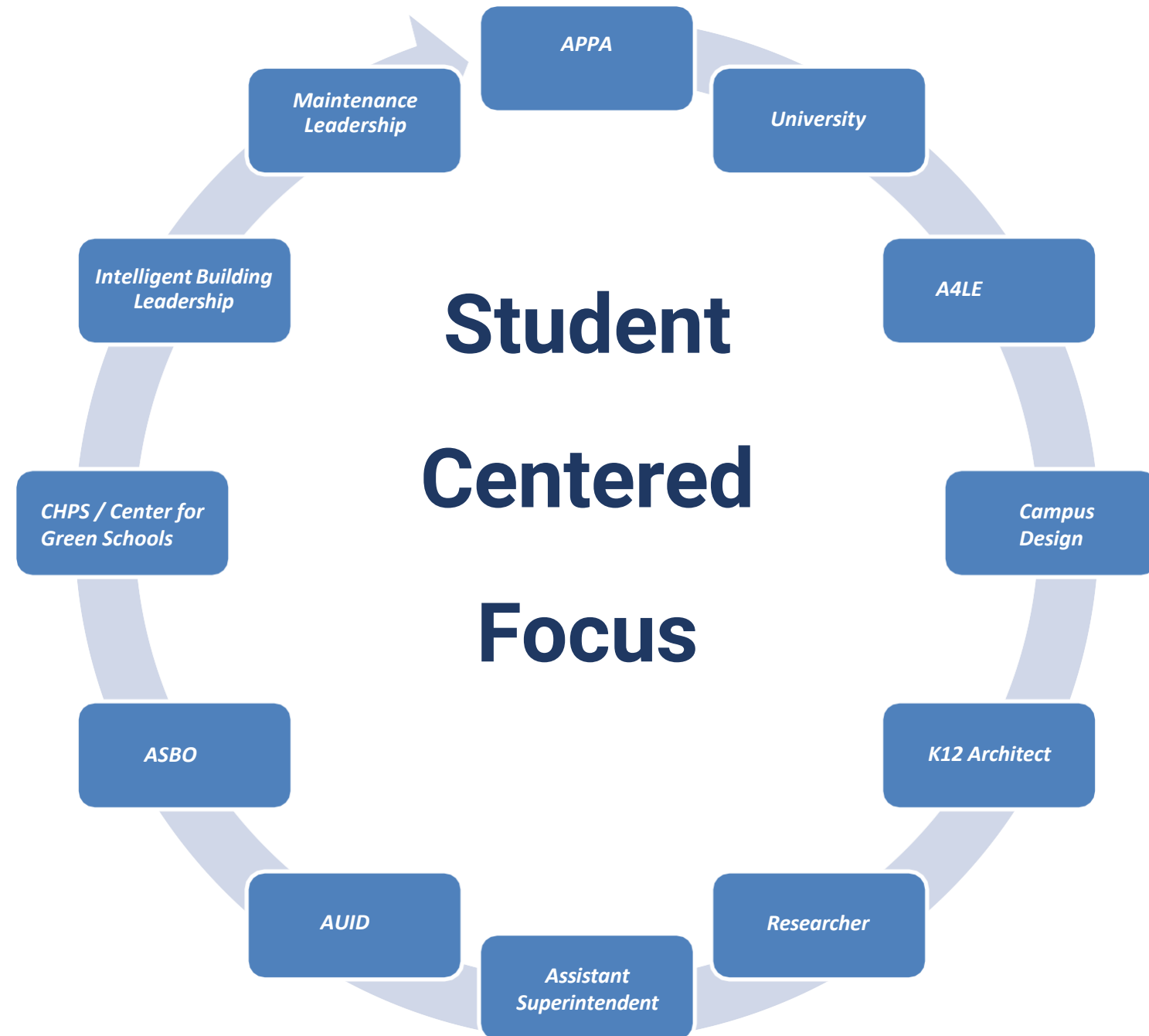


**Why isn't every education
building a healthy building?**





Summit Ambition



K12 & Higher Education stakeholders sharing and listening to each other on how to solve the complex problem of healthy buildings



Wake County Schools

LS3P

BrainSpaces

CyFair Schools

Michigan State University

Fanning Howie

Perkins & Will

CMTA

In2Arch

Wayne State University

Tarkett

Kings Clean

Purdue University

Intelligent Buildings

Clean Health Environmental

Richland Two School District

Adlai Stephenson HS

River City Flooring

Kentwood School District

Allergy Standards LTD

University of Illinois

Prince William Schools

Energy Cap

USGBC



The Need for Health

2022 recap

Math Scores largest decline in history

1 in 4 Teachers Drop out in first 4 years

Mental Health in Students and Teachers

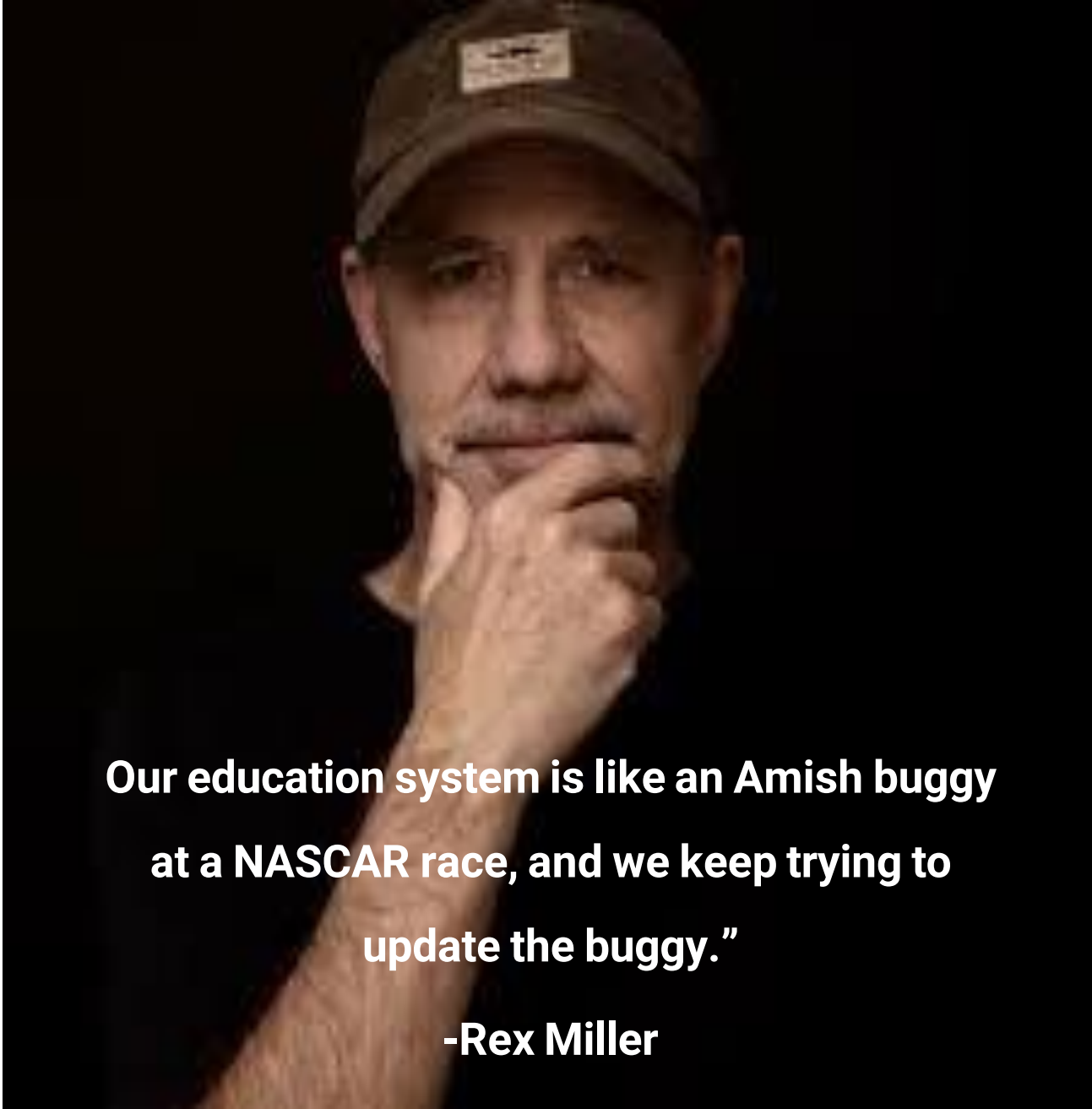
55% of teachers could leave the profession

Chronic Disease on the rise (50+% of population)

Proof that the Built Environment can help

44% of K12 buildings are considered Unhealthy

Rex Miller, Author



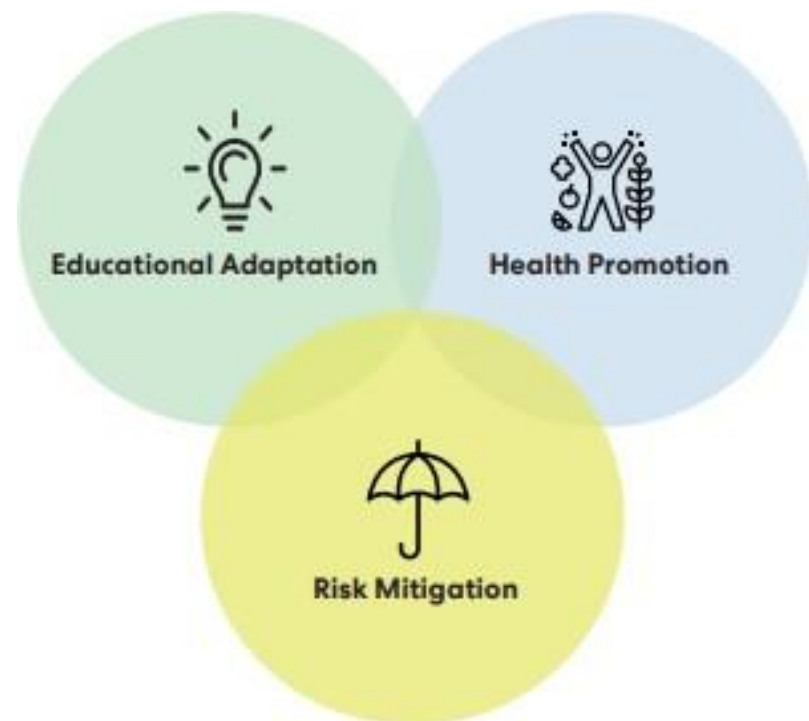
**Our education system is like an Amish buggy
at a NASCAR race, and we keep trying to
update the buggy.”**

-Rex Miller

What is a Healthy School Building?

The World Health Organization states that “health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.”

Schools are uniquely positioned to have either positive or negative influence on all aspects of individual and community health.



Holistic Approach

Educational Adaptation:
support flexibility in behavior, logistics, and technology during shifting teaching needs

Health Promotion:
promote physical and mental health, social cohesion, and a sense of belonging and safety

Risk Mitigation:
reduce adverse environmental exposures that influence school occupant health and performance

2022 driving into 2023

What is keeping us from Healthy Schools

Funding:

- Money comes after an environmental crisis
- High % of buildings exceeding useful life

Leadership:

- The field needs more visionary leaders
- The whole discussion needs simplification
- Generational Split
- Unbiased, holistic plan with a long-term vision

Varied Metrics, Simplified:

- Educational quality is defined by consistent, comparable metrics (e.g., attendance, test scores, GPA), but healthy buildings continue to be measured in diverse quantitative and qualitative ways. The lack of regular, systematic measurement of environmental and social quality limits our ability to mobilize resources, diagnose key challenges, and measure progress.

“If you ask people to use a 15-year old computer, they’d have a fit. Yet we use a school model that’s 50-60 years old”




2022 Tarkett, Objective = Result

Perkins&Will | Tarkett

Setting the Standard for Healthy From the Floor Up

Tarkett Perkins&Will



Progress

This report aims to support healthy flooring in schools. There are many opportunities available for architects and designers, and users to make informed, healthy decisions. Yet the manufacturing industry should also be applauded for taking steps to make a difference. While this report does shed a light on chemicals of concern, there is work being done both on the manufacturing side, as well as the research side to understand the chemicals and products in the built environment.

According to Rice University's Baker Institute for Public Policy, since 1987, vinyl chloride emissions have declined by more than 86 percent per pound (128). While this statistic encompasses the PVC industry as a whole, it does highlight important work that has been done.

In the flooring industry, new products are constantly introduced. Many manufacturers have introduced PVC-free resilient flooring and PVC-free carpet backing. These are wholesale changes to create new, healthy products. Existing products are also being reviewed, as evidenced by Tarkett's Material Health Statements (below) showing the replacement of phthalates in European products. It is true that there is still more work to be done to ensure healthy, safe schools. But change can only be achieved through strong partnerships.

IEQA

Material	Phthalates	Other
Product A	Low	Low
Product B	Low	Low
Product C	Low	Low

MHS

Material	Phthalates	Other
Product A	Low	Low
Product B	Low	Low
Product C	Low	Low

CleanHealth Environmental Risk Management Solutions

A Case Study: Powerbond® RS Flooring's Versatility

Managing residential housing for college students presents a unique challenge. To now have pets, adds another factor to consider in the maintenance of floors becomes critical in removing allergenic particles, minimizing the risk of severe pulmonary triggers, skin irritations and renovating these facilities, the selection of flooring for aesthetics, functionality, durability, and cleanliness is paramount.

Powerbond® RS hybrid resilient soft surface flooring offers a wide range of environmental benefits, but it is also certified for use in schools. A collaboration with the Asthma and Allergy Foundation of America (AAFA) and the University of California, Merced, has resulted in a comprehensive case study to validate the use of Powerbond® RS hybrid resilient soft surface flooring in schools. The study shows that Powerbond® RS hybrid resilient soft surface flooring provides the unparalleled versatility of Powerbond® RS flooring in a residential setting.

ATP Testing in a Residential Setting

Ensuring the cleanliness of shared residential housing. While cleanliness has traditionally been a focus in food and food processing industries, the introduction of modern cleaning technologies has introduced new methods to identify surface cleanliness. One such method is adenosine triphosphate (ATP) testing, which is used as a cleanliness standard in various industries.

Tarkett Flooring Powerbond® RS ATP Summary – UCal Merced

September 1, 2023 Page 4

COVID pandemic. By harnessing bioluminescent bacteria, ATP testing provides a rapid and accurate component of all living cells. The presence of bacteria on a surface is a clear indicator of potential contamination, which may include pathogens. Proper cleaning and maintenance of Powerbond® RS flooring, when seeking economic relief, provides an environment for harmful bacteria to be eliminated.

A 200-unit residence hall at the University of California, Merced, was specifically chosen to represent a residential facility with a high density of students and their emotions. The flooring was installed 14 months prior to the start of the study.

The Sampling Process

In order to establish a starting point for cleanliness, ATP swabs were collected from various locations in the residence hall and analyzed using the advanced ATP testing technology. The results showed that the Powerbond® RS flooring consistently met or exceeded the cleanliness standard in various locations.

Conclusion

ATP testing has been extensively proven to effectively detect and measure surface contamination and overall cleanliness across various industries. Given its reliability, ATP testing serves as an invaluable tool for quantifying the cleanliness of Powerbond® RS flooring after a thorough cleaning and sanitization process. The significance of eliminating pet urine, dander, dust mites, and other contaminants introduced to the floor by pets cannot be overstated when it comes to upholding a healthy and comfortable living environment, particularly for individuals with severe allergies or asthma. Diligent removal of these unseen pet-related pollutants becomes imperative to mitigate the risk of adverse health effects and enhance the overall mood and well-being of residents. If not properly addressed, pet odor can act as a deterrent for residents. ATP testing results from this case study unequivocally showcase Powerbond® RS flooring's impeccable cleanliness, which ultimately elevates the indoor environmental quality (IEQ) and significantly mitigates the risk of pathogens.

Notes:
 * Pre-treated with Syon 5 at a dilution recommended for heavily soiled surfaces. Following a Whitaker Smart Care® 20-inch TRIO System carpet extractor was used to agitate and treat the flooring with Benefect Botanical Disinfectant. The disinfectant was given 10-12 minutes of dwell time before hot water extraction.

1304 Millgrove Place • Silver Spring, Maryland 20905 • (301) 377-9555 • www.cleanhealthenv.com

Healthy Flooring for Healthy Schools

“FM / M&O Role has the highest impact on building health for the life of the building”

Manage Building



Indoor Environment Quality



Health

Healthy buildings have been found to improve overall well-being, **reduce stress**, and reduce respiratory, and other chronic illnesses



Performance

High Performance building products with a Low Life Cycle Cost have proven to reduce deferred maintenance



“FM M&O Role demand has the highest impact on building health for the life of the building”



Health



IAQ / Acoustics / Visual

Healthy Materials

Effective Maintenance

Reduces Impact / Reverberation

Visually Enhancing



Performance



Reliability / Maintainable

Warranty

Easy Maintenance

Reduces Time

Durable





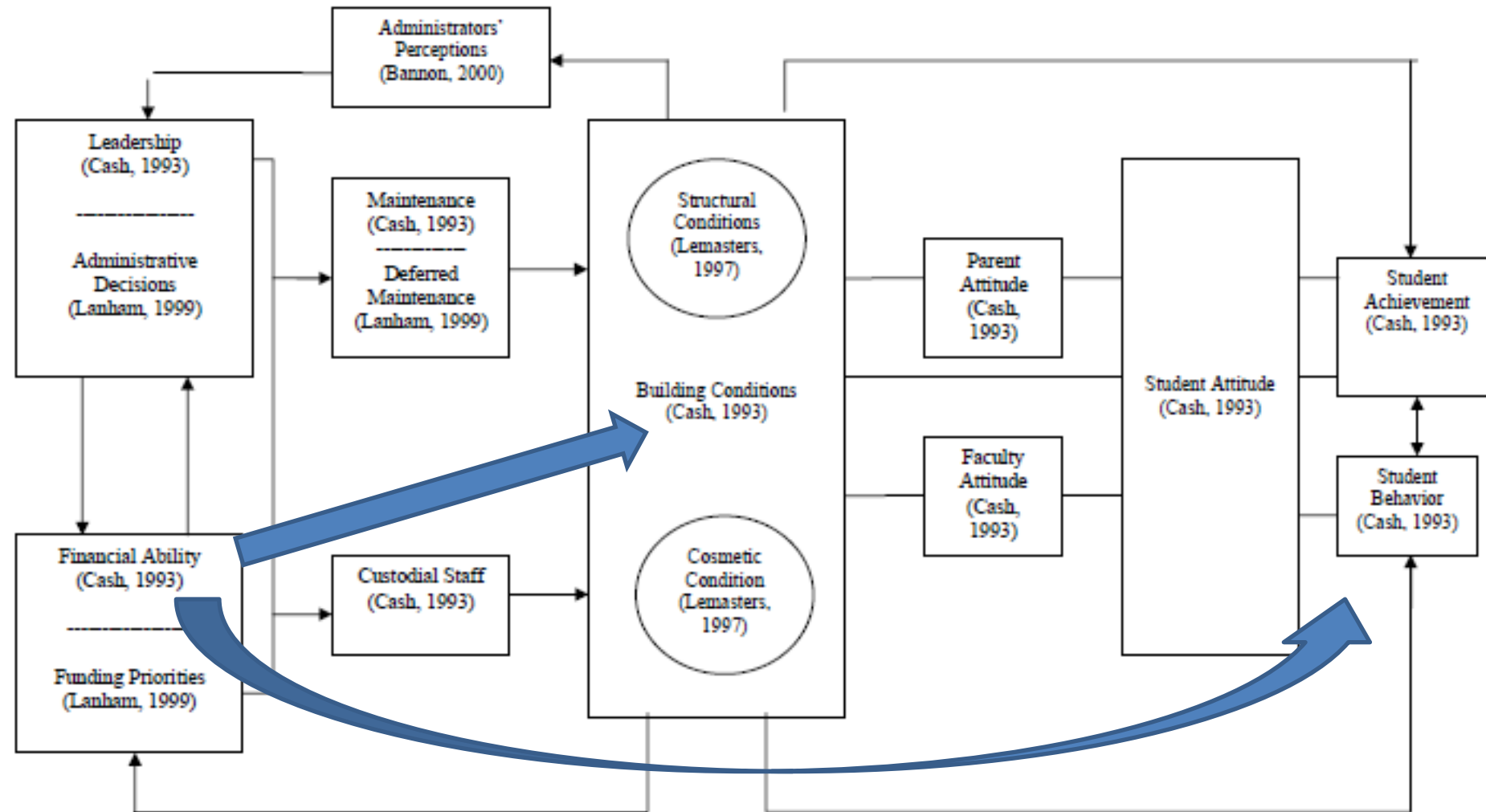
Why Now?

- The State of Our Schools report, 2021
- Data driven decision
- Teams Created after a Health Crisis long-term
- Smart building technology
- COVID Relief Federal Funding
- Long Term Interdisciplinary strategy needs
- Wholistic approach
- Deliver human centered design for Learning

Facilities professionals have focused consistently on reducing their operational and energy costs. While they have been successful at achieving their goals, it sometimes has been done with minimal focus on occupant comfort, health, or safety.



Building Condition – Student Achievement



A Study of the Relationship between Building Conditions and Student Academic Achievement, 2006

Evidence

Summary:

The findings are consistent among previous research that building conditions impact student achievement

Recommendations:

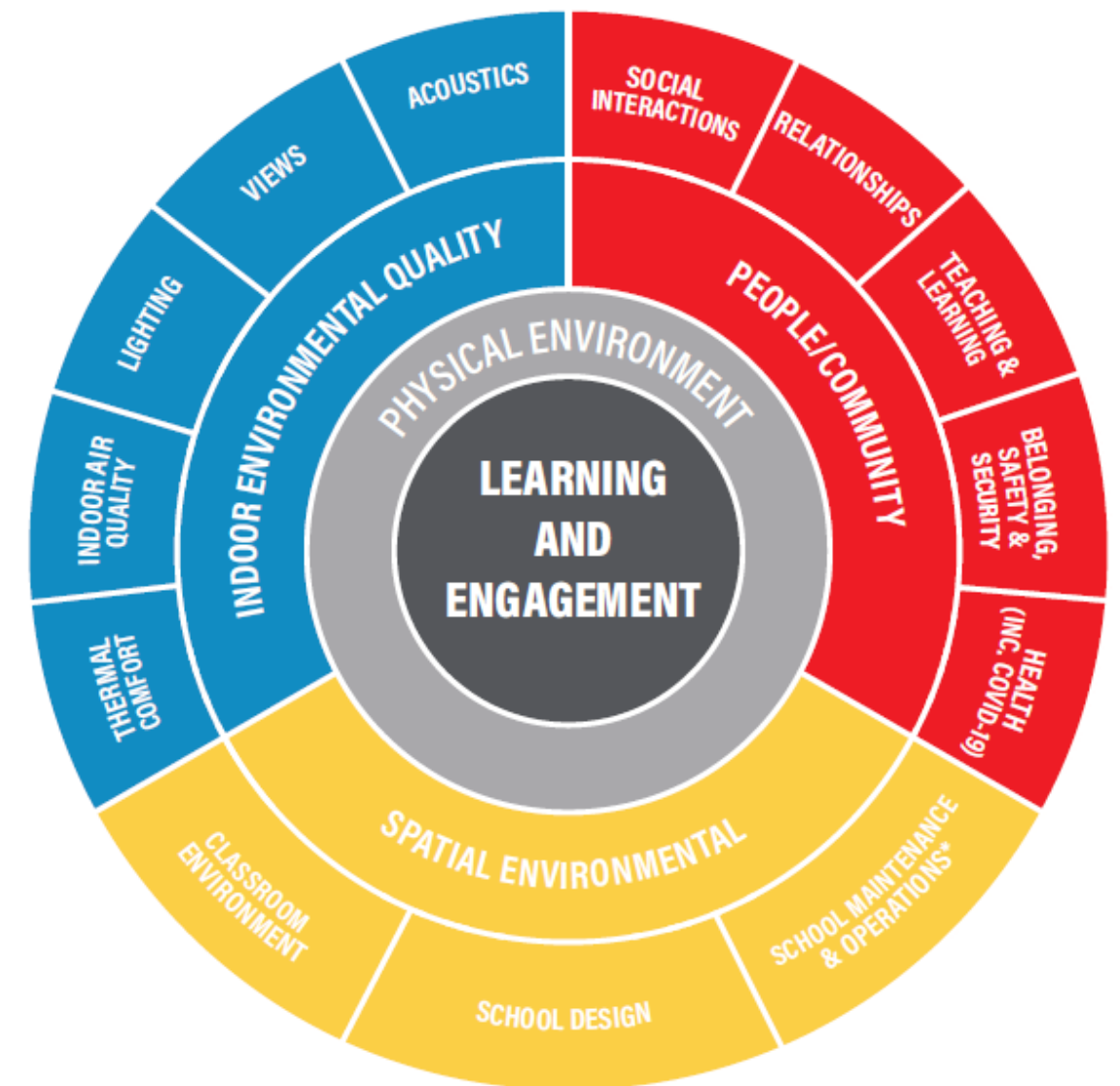
Educational leaders and policy makers must also focus on the declining condition of their school buildings when they are creating short-term and long-term budgetary and facility improvement plans.

KEY FINDINGS:

1. Schools' outdoor green space has a significant positive impact on health, learning and academic achievement.^{51, 173-181}
2. Schools should be flexible and accommodate for a variety of learning situations and activities: social/private, noisy/quiet.¹⁸²⁻¹⁸⁹
3. Less dense classrooms are related with increased student ownership and better student-teacher connection.¹⁹⁰⁻¹⁹⁵
4. Ventilation investments are a necessary and long-lasting measure to prevent COVID-19 and support student performance and general health.^{24, 26, 196-208}
5. Building disrepair has been associated with student performance and absenteeism.²⁰⁹⁻²¹⁸
6. Green schools haven't been directly associated with increased student performance, but their enhanced IEQ, relation to nature and energy efficiency are beneficial for students.^{213, 219-221}
7. Flexible learning spaces allow students to be less sedentary, enable improved student performance, but may present pedagogical challenges.²²²⁻²³⁰
8. Classrooms that incorporate technology, such as Active Learning Classrooms may increase student engagement and performance.^{191, 215, 229, 231-233}
9. Ergonomic furniture positively impacts student health.²³⁴⁻²⁴⁰

Spatial Environment Key Findings, 2021

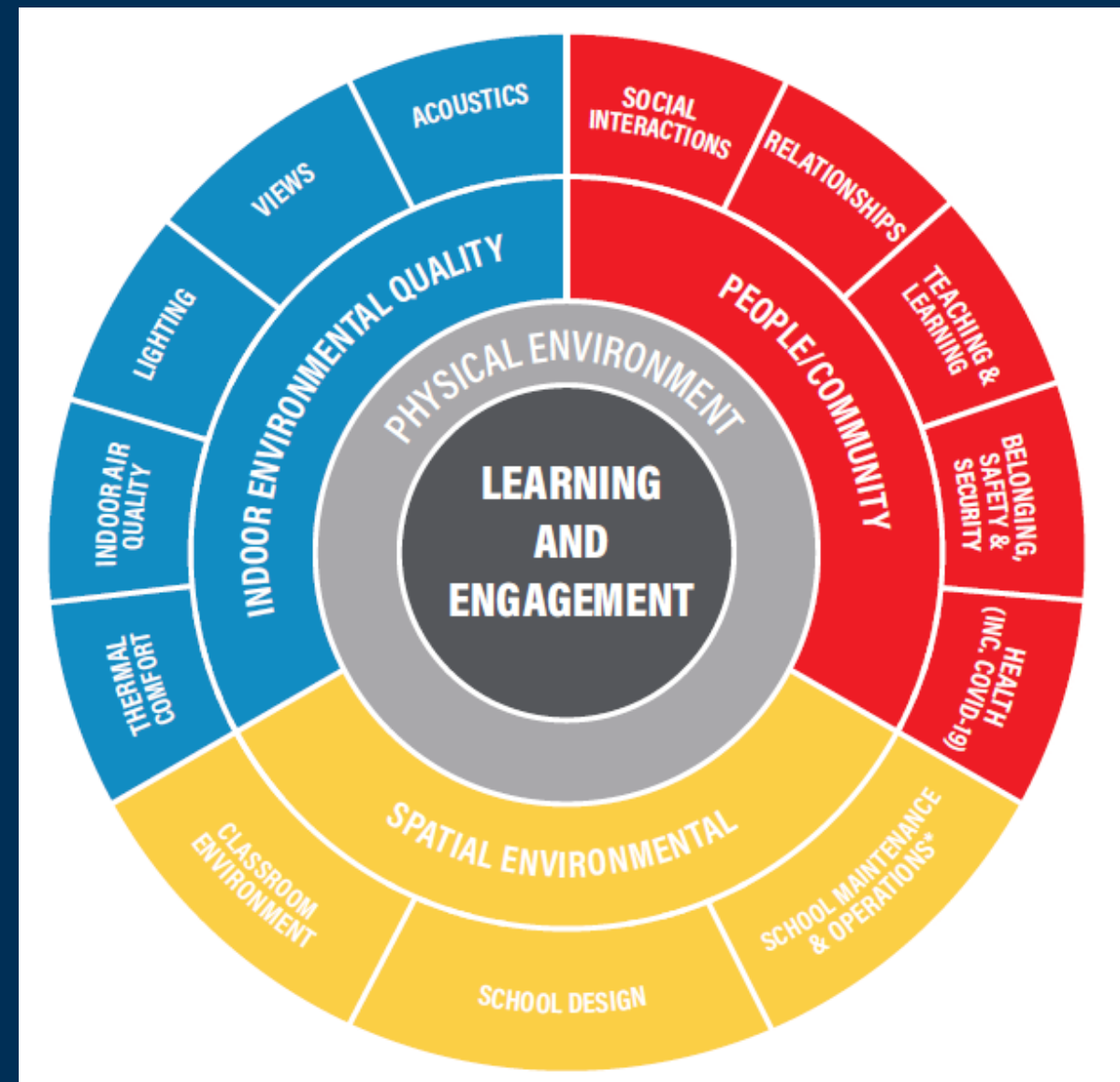
THE IMPACT OF SCHOOL FACILITIES ON STUDENT LEARNING AND ENGAGEMENT



THE IMPACT OF SCHOOL FACILITIES ON STUDENT LEARNING AND ENGAGEMENT

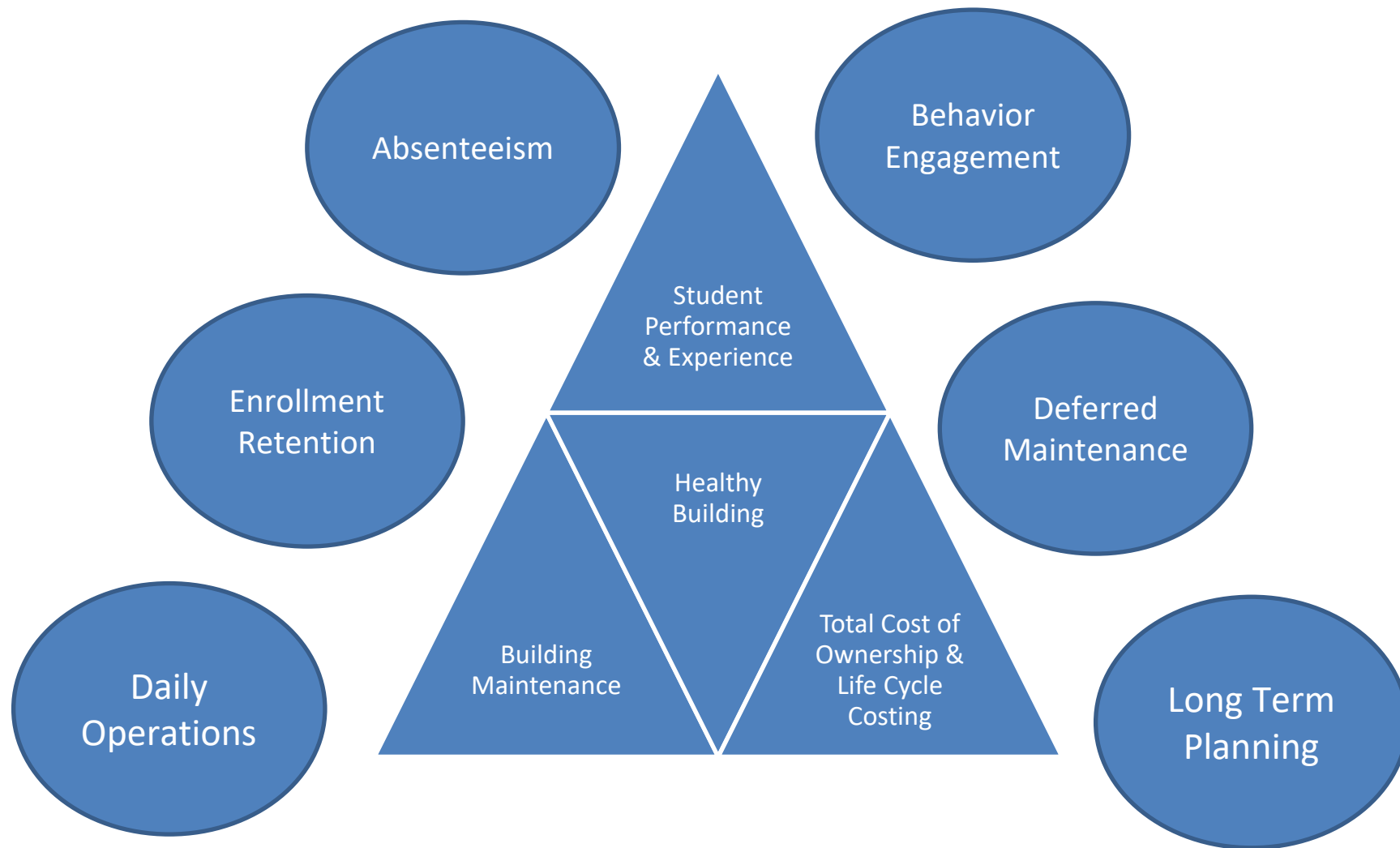
1. There is consistent evidence that children prefer cooler temperatures than adults. ¹⁻⁹
2. There is no consensus on which temperatures allow for better student performance. ^{2,3, 10-18}
3. Thermal distraction, discomfort, and physiological responses may decrease student performance.
4. Issues of adaptability, ventilation types, and temperature variations for performance need further study. ^{2, 13, 15, 19}
5. Increased ventilation rates increase student performance. Conversely, low ventilation rates hinder concentration and test performance standards. ^{11-14, 20-30}
6. Researchers have studied pollutants and microbes in schools concerning health, but few studies have linked them directly with student performance. ^{25, 31, 32}
7. The relationship between IAQ, health, absenteeism, and performance needs further study. ^{25, 31, 33}
8. Access to daylight and windows positively impacts student performance scores. ³⁴⁻³⁹
9. Higher lighting Color Correlated Temperature (CCT) appears to play a role in students' visual acuity and performance, but the wide variety of studies doesn't allow to reach a universal conclusion. ⁴⁰⁻⁴⁶
10. Lighting produces non-visual effects associated with mood and behavior. ^{34, 38, 47}
11. Views of nature decrease stress and increase student performance. ⁴⁸⁻⁵²
12. A good view out of windows is significantly associated with better student learning. ^{35, 53, 54}
13. Indoor plants have a positive impact on student attention and perceptions of the classroom and class. ⁵⁵⁻⁵⁹
14. Children are a high-risk group for chronic noise exposure. ⁶⁰⁻⁶⁸
15. Poor acoustics affect students' learning and communication. ^{62, 66, 69-74}
16. High reverberation times and background noise decrease student performance. ^{63, 71, 75-82}

Indoor Environmental Quality Key Findings, 2021

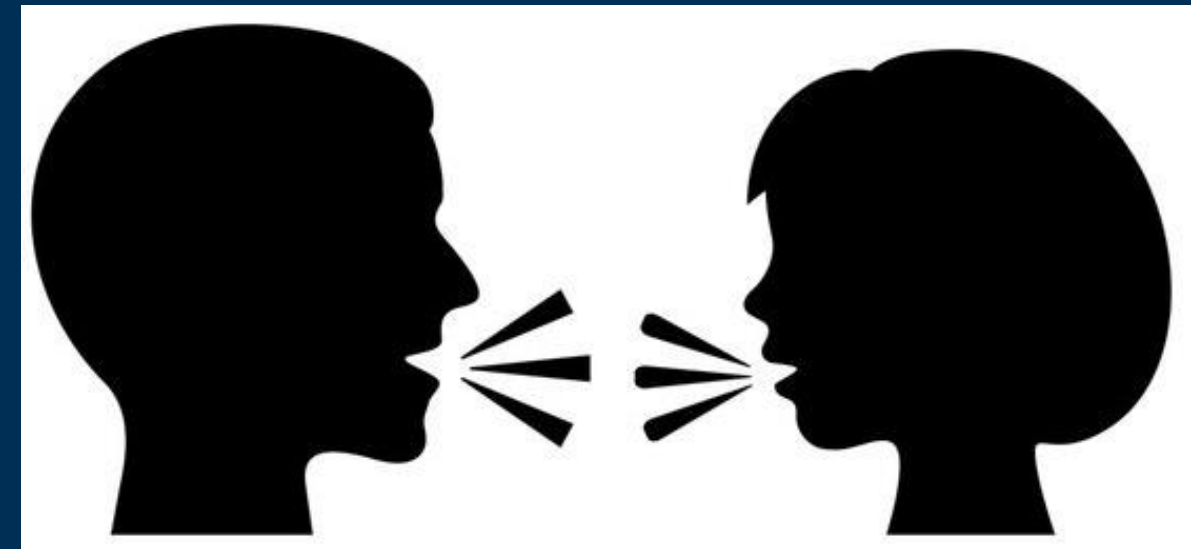


Hypothesis

Combining high-performance and healthy building decision making can have more robust impact on occupant healthy and safety



Facilities professionals have focused consistently on reducing their operational and energy costs. While they have been successful at achieving their goals, it sometimes has been done with minimal focus on occupant comfort, health, or safety.



4 Super Sessions 1.5 Days

Unpacking the High Performance and Health Dilemma

K12 / HE Panel about high performance and healthy buildings discussing intersections, hurdles, and paths forward.

Convergence of TCO & LCCA

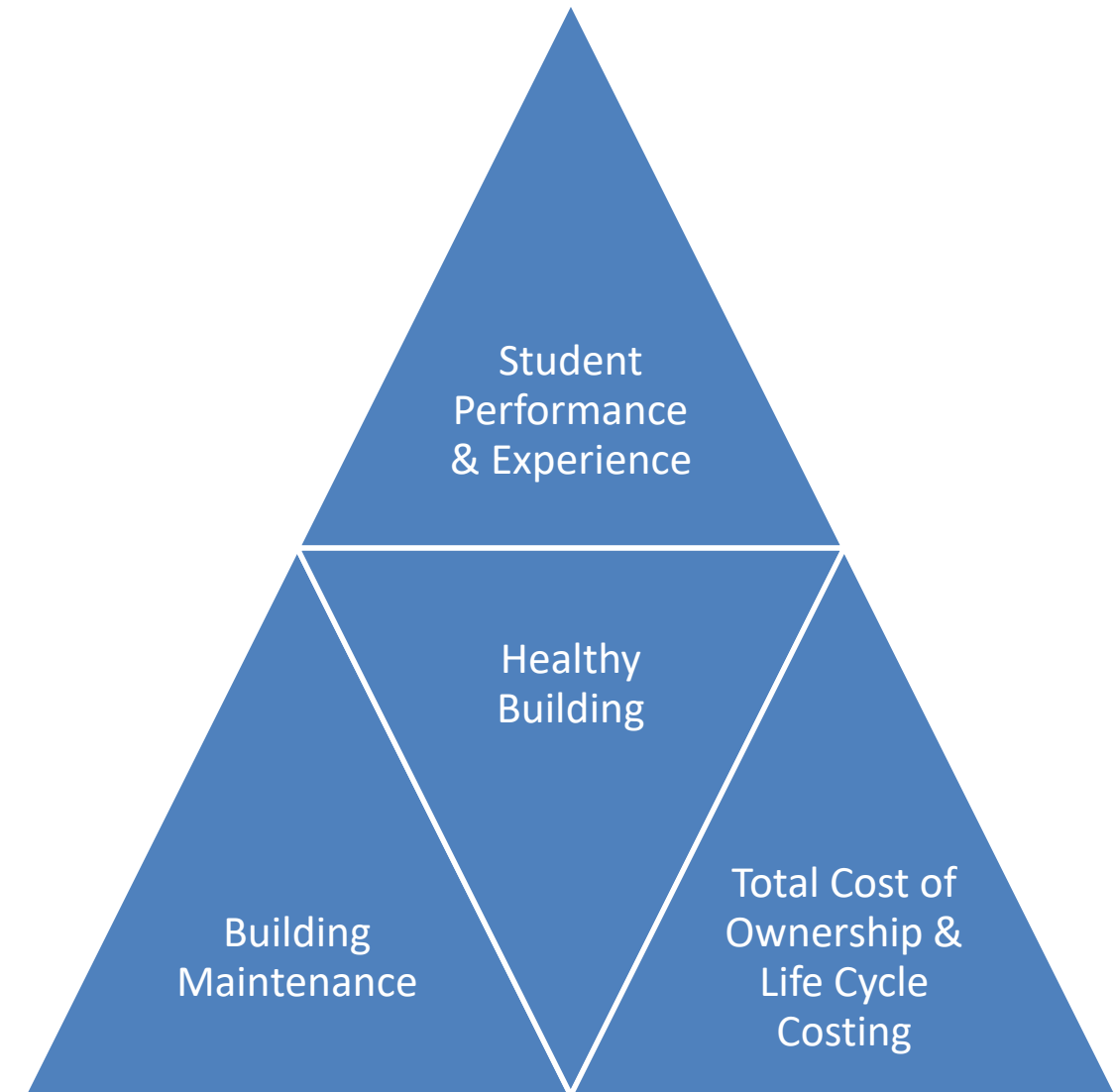
APPA TCO and the growth of deferred maintenance problems within education. How to leverage TCO and LCCA principles to benefit your strategic planning.

Cleaning for Health

Action plan and training gaps are correlated with health outcomes

Telling the Story

Its 2030 and education standard practices are supporting both high performance and healthy spaces. Sharing Best Practices and Critical Storytelling techniques using positive outliers will give us the key breakthroughs to overcome the challenges. What are the biggest hurdles that stand in the way? What do you need to implement and who needs to hear about it.



Unpacking the High Performance and Health Dilemma, Panel

Primary Question:

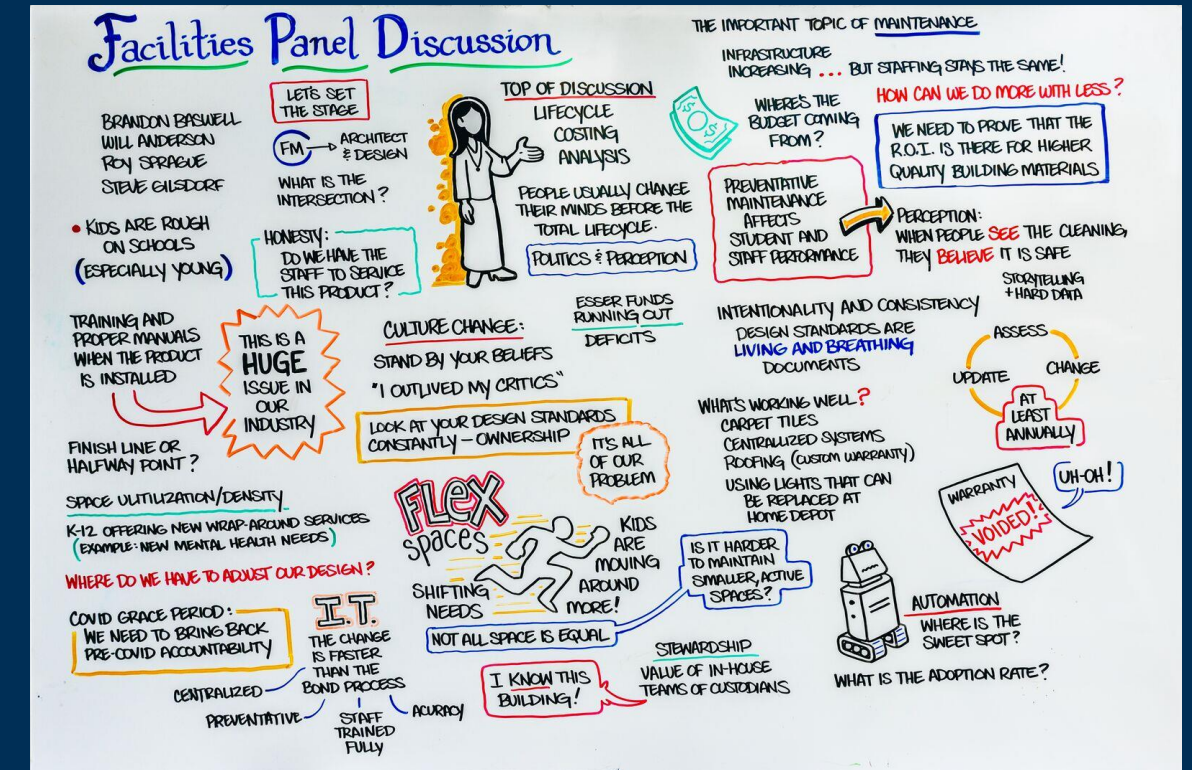
What do facilities teams need in order to succeed?

Key Takeaways:

- Facilities Maintenance people are extremely resilient
- Reduction in FM staffing over the past few years while increasing sf has been common
- Training Needs
- Flex Spaces have an impact on FM/M&O

Path Forward

- Key decision makers like A&D / state leaders need to understand that under resourced FM/M&O impact healthy buildings and ultimately test scores, absenteeism, and overall quality of life for students and staff.



Convergence of TCO & LCCA

Primary Question:

Are we leveraging TCO & LCCA principles and where do they intersect with delivering a healthy building?

Key Takeaways:

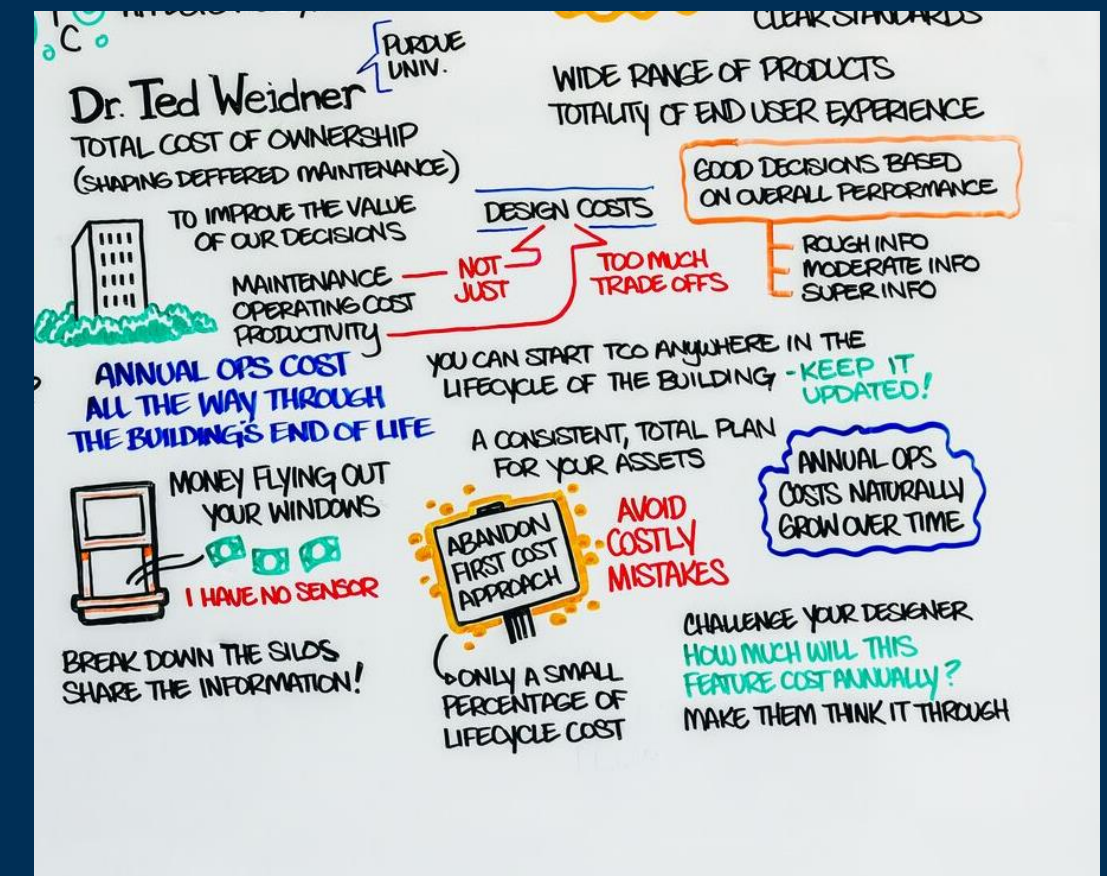
- It started with sealing up the building (windows) back in the 70's
- First cost of products are a very low percentage of the LCCA
- The knowledge of LCCA is not easily accessible
- 92% of flooring decision is M&O

Path Forward

- The need to abandon first cost approach

“If I do not have to replace or update a building item then it gives us funding to invest in new technology or innovation which helps the students. We are too poor to buy cheap”

Funding – Building Conditions – Student Health



Cleaning for Health

Primary Question:

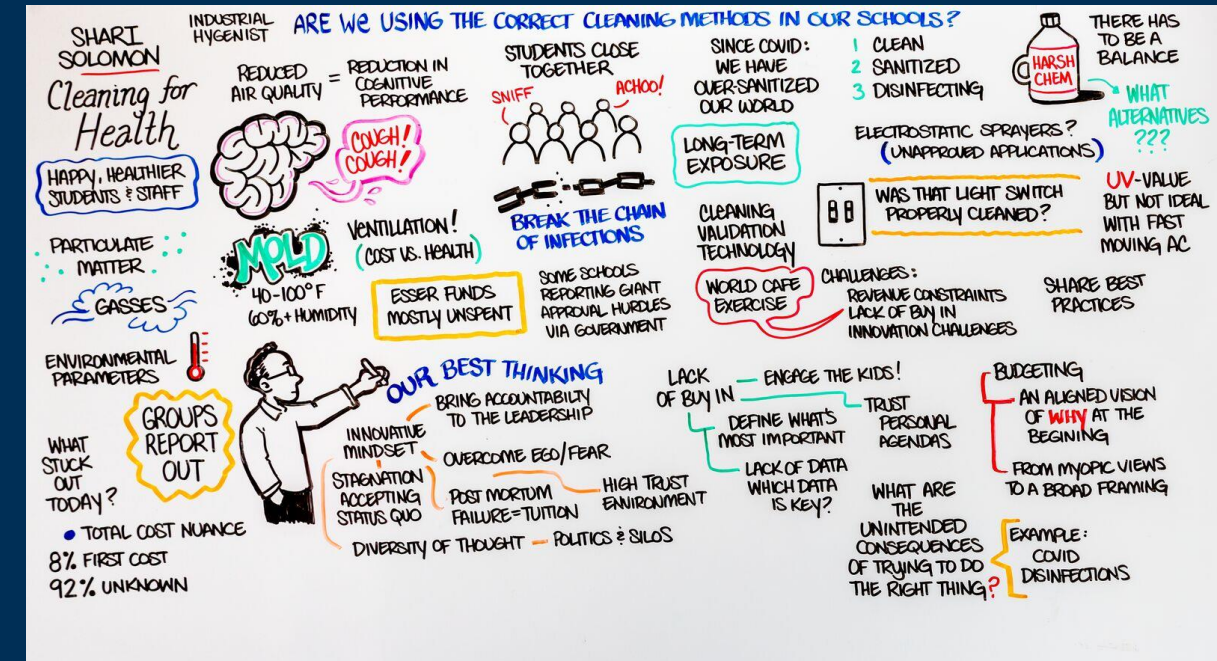
What are the maintenance action plan and training gaps are correlated with health outcomes.

Key Takeaways:

- Maintenance impacts building health
- Lack of Buy In connecting maintenance & occupant health
- Complications around Federal Funding from COVID being fully leveraged
- Over sanitizing because of COVID may have an unknown impact
- Achieving Sanitization in education is the goal...but you have to CLEAN first

Path Forward:

- Leverage manufacturer partnerships / research and get metrics in front of leaders
- Training, Training, Training



Telling the Story, 1

Primary Question:

What questions are we really trying to answer? What story do you need to tell and who needs to hear about it to achieve high performance and healthy schools?

Key Takeaways:

- We are not leveraging building data enough to help make these decision
- Funding follows a story
- Decision making can be politically motivated
- Avg Age of FM vs incoming Digital Age

Path Forward:

- Work collectively to build the story
- Start leveraging Building Data



Telling the Story, 2

Primary Question:

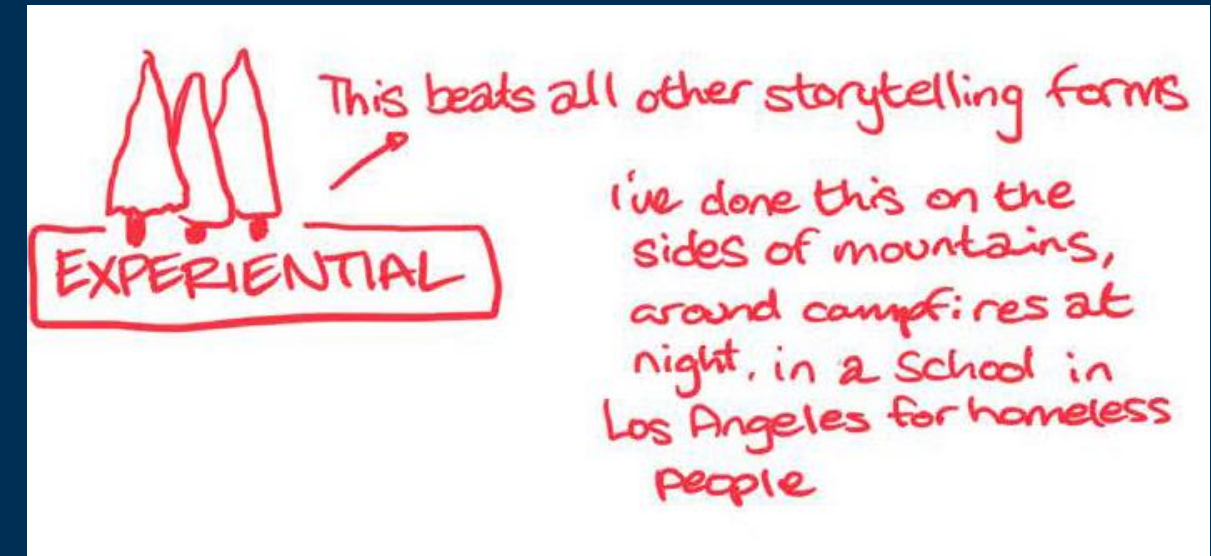
What questions are we really trying to answer? What story do you need to tell and who needs to hear about it to achieve high performance and healthy schools?

Key Takeaways:

- So many messages coming at us hourly
- Knowing your Audience
- Experiential Stories beat all other storytelling forms
- Create Clarity in your message – something that can be repeated within 2 minutes

Path Forward:

- Work collectively to build the story
- Take to your own team first to build consensus
- This will take a multi disciplinary approach to meet the challenge of high performance / healthy



What is your commitment, Actions 2023

Big Takeaway(s) to ACTION

- We HAVE TO tell the story of healthy buildings
- LCCA needs to be integrated into our decision making
- Abandon First Cost Mentality
- Work Together leveraging research
- Work within my organization to learn, FIRST
- Take this message to leadership withing the State leadership
- I want to tell my son about this
- Financial drives almost everything
- The WHOLE child is our target and the cumulative bottom line
- The Total Cost needs to be more wholistically measured
- More partners need to be discovered – Business/Community
- Ongoing engagement with M&O with follow up training
- Create IEQ policy to be adopted by FM/M&O that is easy and effective
- Push sense of urgency with research/data about HSB's
- ALWAYS use minimum 50 yr vantage point as it impacts everything

How will you promote healthy schools, 2022?

- Articulate benefits to all stakeholders
- Leverage Pandemic to maintain momentum
- Push into our building codes
- Involve community stakeholders
- Use more positive messaging to activate scarce resources
- Incorporate public health research



Why is Flooring part of a Healthy Building

Funding:

- Clear understanding of a Life Cycle Costing Analysis
- Effective Maintenance Strategies
- Some flooring requires no finish at all
- 10 yr warranty vs Lifetime Non-Prorated Warranty

Indoor Air Quality:

- Harmful Toxins
- Soil Localization
- Effective particulate recovery
- Asthma and Allergy Certification

Acoustics:

- Significant reduction in distractions
- 100% difference between commonly flooring categories
- Impacts test scores & cognitive load
- 2.4B annual sick leave for teachers with vocal disorder
- Younger students miss as much as 75% of content
- Significant reduction in engagement

- **6.1 M children** under 18 have asthma
- **50%** of children w/ asthma have **uncontrollable asthma**
- Avg. annual medical costs of asthma are nearly **\$1,000/child**
- Asthma is the **leading chronic cause** of school absenteeism



Healthy Building Summit 2022



- A4LE
- Michigan State University
- Tarkett
- Intelligent Buildings
- Energy Cap
- Greenville County Schools
- University of Wisconsin
- Perkins Will
- University of Arizona
- Meteor Education
- DLR
- Group Wight & Co
- American University
- Cal Tech
- Prince William County Schools
- Fanning Howie
- In2Arch
- Clemson University
- Cypress Fairbanks ISD
- Richland Two Schools

Healthy Building Summit 2023



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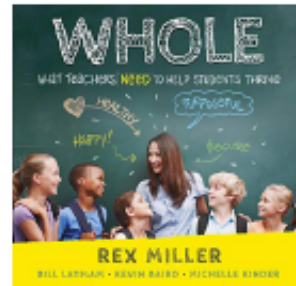
Special Thanks

Resources



Productive, Smart Buildings Framework APPA

Self-assessment, decision-making framework for healthy buildings using smart technologies across a campus.



WHOLE Rex Miller

Book explains how removing stress from the classroom improves education for administrators, teachers, parents, and communities.



Healthy Schools by Design Perkins&Will

Repository of health research and design strategies for K-12 schools



Healthy Buildings Joe Allen & John Macomber

NY Times Book of the Year that covers how buildings can expose occupants to and protect from disease through 9 Foundations.



Indoor Air Quality Tools for Schools Action Kit U.S. EPA

Toolkit includes practical ways for schools to prevent and solve most indoor air problems.



Collaborative for High Performance Schools CHPS

Criteria and resources for schools, districts, and designers to create high performance schools.



Foundations for Student Success Harvard T.H. Chan School of Public Health

White paper on how school environmental quality influences student health, thinking and performance.



Healing Schools Guidebook Healthy Schools Project

Organization and tools with an equity-centered approach for educators.

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What are is the biggest hurdle standing in the way of creating high performance and healthy schools

What one thing can you do to push this forward

Who needs to hear more about this



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