

GSA

CENTER
FOR ACTIVE
DESIGN®



Health in Buildings Partnerships and GSA's Vision for the Future



Welcome Poll



[Slido.com](https://www.slido.com): #HealthInBuildings; to access polls and Q&A

GSA's Vision for the Future



[Administration](#) [Priorities](#) [The Record](#)

DECEMBER 08, 2022

FACT SHEET: DEPARTMENTS AND AGENCIES COMMIT TO CLEANER INDOOR AIR ACROSS THE NATION

[U.S. Department of the Interior](#) [OSTP](#) [NEWS & UPDATES](#) [PRESS RELEASES](#)

Our past informs our future(s)



2010

Office Layout
& Stress
Denver
Federal
Center

2013

Measuring
connections
between
Light &
Health

2018

Office Layout,
Physical
Activity,
&
Stress

2019

Measuring a Personal
CO2 Bubble &
Design Guideline for
Circadian-effective
Light (UL24480)

2020

Dry Air
&
Stress

2021

Total Workplace
Scorecard,
Enhancing Health
with Indoor Air

2022

Ventilation as
Public Health
Strategy;
UL Design Guideline
added to P-100

2023

Testing Design
Guidelines
(UL24480) and
piloting in GSA
capital projects

GSA Tools Poll



[Slido.com](#): [#HealthInBuildings](#); Polls and Q&A

Promoting Health in Buildings

	ASHRAE 189.1-2017 	DOD UFC 1-200-02 (DEC 2016) 	FITWEL V2.1 	GREEN GLOBES 	GSA PBS-P100 (JUL 2018) 	LEED V4.1 	WELL V2 
Air Quality and Control of Temperature GP IV. Enhance Indoor Environmental Quality: Ventilation and Thermal Comfort <i>Provision of ventilation systems, control of pollutants, IAQ management, and controls for occupant thermal comfort</i>							
Air Quality and Exposure to Mold and Mildew GP IV. Enhance Indoor Environmental Quality: Mold and Mildew <i>Provide policies and strategies for moisture control</i>							
Air Quality and Exposure to Radon GP IV. Enhance Indoor Environmental Quality: Radon <i>Test for radon in buildings to mitigate high levels from occupied spaces</i>							
Air Quality and Off-Gassing and Exposure to VOCs GP IV. Enhance Indoor Environmental Quality: Low-Emitting Materials <i>Selection of low-emitting materials</i>							
Air Quality and Plants GP IV. Enhance Indoor Environmental Quality: Plants <i>Provide access to indoor and outdoor plants</i>							
Air Quality in Occupied Buildings Under Construction GP IV. Enhance Indoor Environmental Quality: Indoor Air Quality during Building Alterations <i>Control of indoor air quality and impact on occupants during building alterations of existing spaces</i>							

Promoting Health in Buildings



Sustainable Facilities Tool
U.S. General Services Administration

LEARN

Sustainability Topics

PLAN

Strategies & Tools

EXPLORE

Virtual Facility

PROCURE

Products & Services

APPLY

Case Studies

TRAIN

Career Planning

Log On



Facility Topics

The first step to creating a high-performance facility is to learn about the components. Use the sections below to learn how you can reduce utility costs and improve occupant health in your facility. And be sure to check out our other [Helpful Tools](#) for everyday tasks.

CLIMATE

ENERGY

WATER

HEALTH

OTHER TOPICS

FEDERAL REQUIREMENTS

Buildings can enhance occupant health by eliminating risks and creating supportive environments. Discover how to make your building healthier.

CHOOSE A TOPIC TO LEARN MORE

Health Enhancing Strategies

Buildings and Health

Healthy Cleaning

Sustainable Response to COVID-19

Enhancing Health with Indoor Air

Circadian Light

Biophilic Design

Health & Wellness Guidance Crosswalk



Federal Center South

Total Workplace Scorecard: <https://sftool.gov/TWS>

Complete / View scorecard
Work on an existing scorecard

Create new scorecard
Start a new scorecard

Clone Scorecard
Clone an existing Scorecard

Manage scorecard
Grant access and edit basic information

View scorecard result
See summary results for a scorecard

Print blank scorecard
Printer-friendly scorecard layout

Generate scorecard report
Print or save a final report

Compare Scorecards
Compare multiple scorecards

Total Workplace Scorecard / Back To Scorecard Main Page

Healthy Strategies Pilot 5-12-22

Save Progress

Question 0

View Instructions

Combustion-based heating equipment fuels can include natural gas, propane, fuel/heating oil, and biofuel.

Who: Facility Manager

Resource(s):

- SFTool | HVAC Whole Building System

Is there combustion-based heating equipment present?

☒ Yes

☐ No

Notes

Add notes / observations...

Progress Summary

View Instructions

% = percent complete

I. ENGAGEMENT 4/10 Points

1.1 Engagement 100 %

II. HEALTH, COMFORT and PERFORMANCE 35.27/50 Points

2.1 Air Quality 100 %

2.2 Thermal Comfort 100 %

2.3 Light 100 %

2.4 Acoustics 100 %

2.5 Physical and Musculoskeletal Health 100 %

III. WORKSPACE FLEXIBILITY, EQUITY, & MOBILITY 25/30 Points

3.1 Flexibility 100 %

3.2 Mobility & Connectivity 100 %

3.3 Equity 100 %

IV. SENSE OF PLACE 7.5/10 Points

4.1 Sense of place 100 %

V. EXTRA CREDIT 6/10 Points

5.1 Extra credit 100 %

77.77 / 100 total points

Scorecard Comparison

☐ View differences only

Best Answers [Template - Scorecard 1.0 (2020)]

NEW Region 5 Baseline

Healthy Strategies Pilot 5-12-22

Legend:

• • • • •
Answer not selected
/ No Score question

• • • • •
Needs Improvement
(Score: 0 - 5%)

• • • • •
Could be improved
(Score: 5 - 35%)

• • • • •
Good
(Score: 35 - 65%)

• • • • •
Better
(Score: 65 - 95%)

• • • • •
Best
(Score: 95 - 100%)



Federal High-Performance Green Buildings

[Overview](#)
[Policy](#)
[Resource Library](#)
[Energy & Water](#)
[Health](#)
[Circadian Lighting](#)
[Edith Green-Wendell Wyatt Federal Building](#)
[Federal Center South Building 1202](#)
[GSA Headquarters - 1800 F Street](#)
[NCR Regional Office Building](#)
[Wayne N. Aspinall Federal Building](#)
[Dept of State Harry S. Truman Building](#)
[FHWA and Department of VA](#)
[Wellbuilt for Wellbeing](#)
[Total Workplace Scorecard](#)
[Biophilic Design](#)
[Integrative Strategies](#)
[Building Operations](#)
[Safeguarding Assets](#)
[Sustainable Acquisition](#)

Circadian Light For Your Health

The use of daylighting in buildings has focused primarily on reducing energy consumption and providing pleasant interior environments. However, light, especially daylight, may be good for one's health through impacts on the body's circadian rhythms. Given that people spend a majority of their waking hours indoors at work, daylight - if appropriately engineered and supplemented by electric light when necessary - may have unrecognized health benefits.



What are Circadian Rhythms and What is Circadian Light?

A person's "body clock" is regulated by circadian rhythms, which are physiological processes that occur approximately every 24-hours. These 24-hour rhythms have also been widely observed in plants, animals, fungi, and even bacteria. An example of a circadian rhythm is a person's wake/sleep cycle. A function of light is to entrain

the body's circadian system to the solar day so that the wake/sleep cycle is entrained or synchronized with the natural light/dark cycle on Earth. If a person's circadian functioning is entrained, a person sleeps well at night and is alert during the day.

Purpose of GSA's Circadian Research

GSA's research has been focused on identifying the links between the amount of light people receive at work and their wake/sleep patterns, daytime alertness, and emotional functioning. GSA's overall goal is to identify specific health benefits of lighting practices that can be replicated in new and existing buildings to achieve innovative and cost effective ways to improve employee health and well-being at work.

GSA conducted this research in several phases. The first phase consisted of taking both space and personal circadian light measurements, and the results showed that while daylight is valuable, it is an insufficient source of circadian stimulation when used alone due to occupant behavior, interior design, low levels of daylight penetration, and other circumstances. In the first phase, GSA conducted its research in five of its buildings in different geographical locations and in both the summer and the winter to account for seasonal variability in daylight.

- [GSA Headquarters](#), Washington, DC
- [Edith Green-Wendell Wyatt Federal Building](#), Portland, Oregon

Additional Information

- [A Case for Circadian Lighting in Federal Buildings](#) (PDF - 377 KB)
- [Lighting and Health Research Center, Icahn School of Medicine at Mt. Sinai](#)
- [NIH Fact Sheet on Circadian Rhythms](#)
- [More Information on Circadian Light](#)

What We Have Learned So Far

- People receive more light at work than anywhere else
- The best time of day for circadian stimulus is in the morning for at least 30 minutes
- People seated near windows and on higher floors receive more circadian stimulus
- Daylight is sometimes not enough; even in well-daylit buildings, there are pockets of biological darkness and low levels of circadian stimulus that may require additional electric light
- Interior workspace design can aid or limit daylight exposure
- Occupant behavior matters in promoting or diminishing circadian stimulus
- Shade use, primarily to reduce glare on computer screens, also reduces circadian stimulation if

Circadian Lighting

- Links to GSA circadian-lighting research
- Learning videos
- Frequently asked questions

Background on Lighting and Circadian Rhythms

Video 2 — Mariana G. Figueiro, Director & Professor,
Mount Sinai Light and Health Research Center


 Light and Health
Research Center




Enhancing Health with Indoor Air

- The quality of our indoor air is critical to our health, comfort, and performance
- Increasing ventilation rates beyond conventional design could reduce *absenteeism, inflammation, infection, and other symptoms of sick building syndrome!*

Lever 1
Provide More
Fresh Air

Lever 2
Remove Outdoor
Pollutants

Lever 3
Manage Thermal
Conditions

Lever 4
Eliminate Indoor
Contaminants

Perceptions Poll



[Slido.com](#): [#HealthInBuildings](#); Polls and Q&A

Certifications Poll

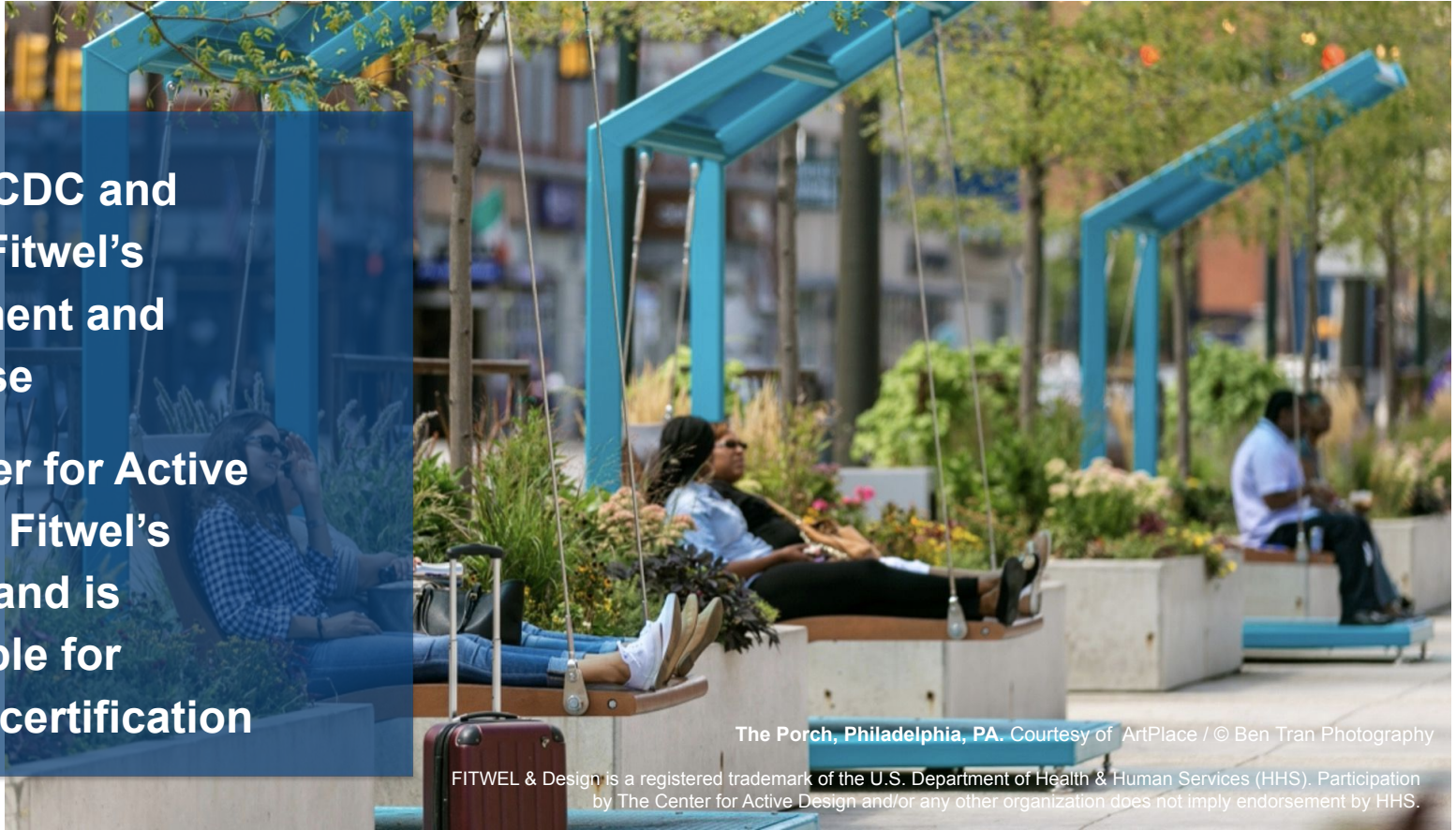


[Slido.com](https://www.slido.com) - [#HealthInBuildings](#)

Development of Fitwel Standard

The U.S. CDC and
GSA led Fitwel's
development and
pilot phase

The Center for Active
Design is Fitwel's
operator and is
responsible for
3rd party certification



The Porch, Philadelphia, PA. Courtesy of ArtPlace / © Ben Tran Photography

FITWEL & Design is a registered trademark of the U.S. Department of Health & Human Services (HHS). Participation by The Center for Active Design and/or any other organization does not imply endorsement by HHS.

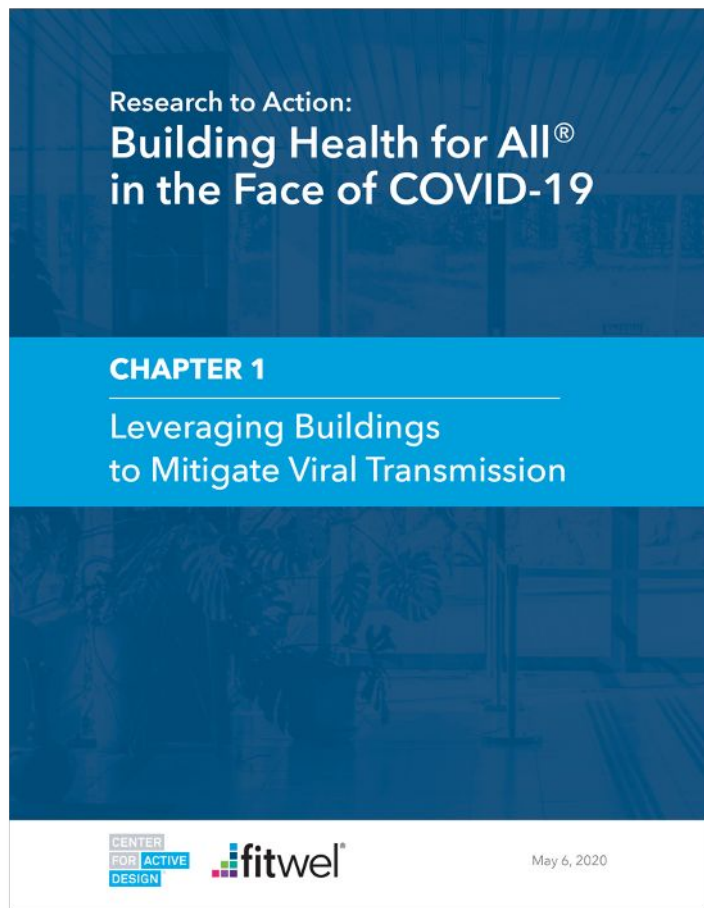
Development of Fitwel Standard



FITWEL CHAMPION
AvalonBay Communities

Fitwel Rating: ★





Fitwel COVID-19 Response

- Developed a series of publications designed to offer evidence-based guidance to real estate sector.
- Transformed this research into the Fitwel Viral Response Module.
- Integrated findings and learnings into v3 Fitwel Standard.

Stay Connected

Website

www.fitwel.org

Mailing List

www.fitwel.org/contact

Twitter

 @fitwel

LinkedIn

Fitwel Certification System

Salesforce East

Fitwel Rating ★



WELL applies the science of how physical environments affect human health, well-being and performance.

Within walking distance of farmers' market.

Access to filtered drinking water.

Access to daylight and outdoor views.

Use of indoor plants.



MIND



COMMUNITY



MOVEMENT



WATER



AIR



LIGHT



THERMAL
COMFORT



NOURISHMENT



SOUND



MATERIALS

7,000+

peer-reviewed studies
and citations

20,000+

industry leaders and
practitioners

30,000+

locations
enrolled

500+

evidence-based
interventions

IWBI Task Force on COVID-10 and other Infectious Respiratory Diseases



Building Health Movement: 400M to 4.7B from 2019-2023



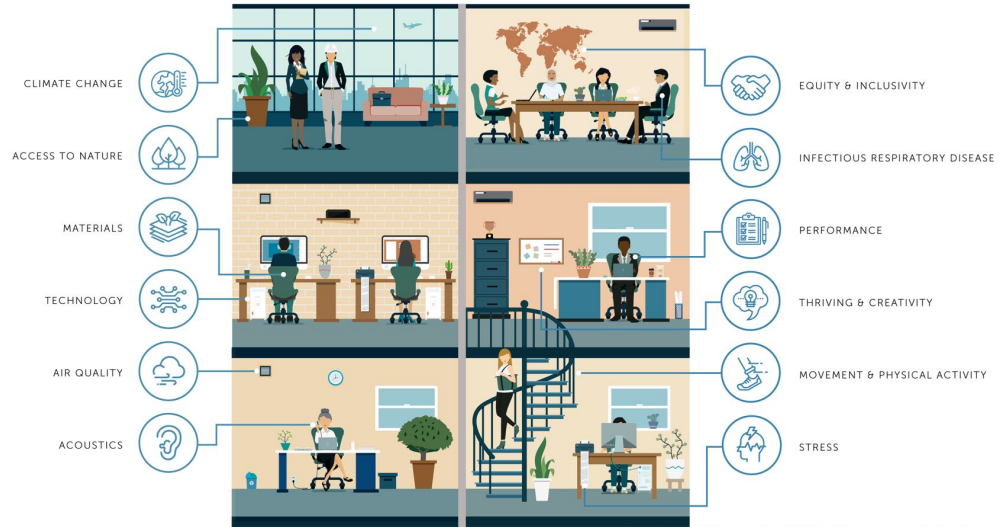
The International WELL Building Institute's

GLOBAL RESEARCH AGENDA:

Health, Well-Being and the Built Environment



12 IMPACT TOPICS



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WWW.RESOURCES.WELLCERTIFIED.COM/TOOLS

Investing in health pays back.

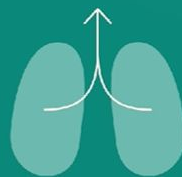
Research shows that companies that invest in health and well-being strategies can benefit from enhanced performance and increased financial returns.



7.7%
higher rents
per sq ft
in certified healthy
buildings [MIT]



\$115
per sq ft in
10-year NPV
for healthy, high
performing buildings
[Stok]



8%
increase
in employee
performance
associated with improved
air quality [Harvard]

Download IWBI's Research Review, featuring nearly 60 independent studies:

[WEAREWELL.COM/HEALTH-PAYS-BACK](https://www.weiarewell.com/health-pays-back)

The impact of WELL

A new study published in *Building and Environment* found that occupants in WELL Certified spaces report **improved workplace satisfaction, increased levels of productivity** and **gains in perceived health and well-being**.



Research Spotlight

The WELL Factor: Understanding the Impact of WELL Certification

A new study in the *Journal of Building and Environment* finds WELL Certification boosts occupant perceived satisfaction, health, well-being and productivity

Brief Synopsis

In the largest and most comprehensive research of its kind, a newly published peer-reviewed study in the *Journal of Building and Environment* found that occupants in WELL Certified spaces report improved workplace satisfaction, increased levels of productivity and gains in their health and well-being. The study analyzed the impact of WELL Certification using more than 1,300 pre- and post-occupancy survey responses from six companies in North America with analyses conducted at both the aggregate and company level. Specifically, the study showed WELL Certification improved overall occupant satisfaction by nearly 30%, as well as occupant perceived well-being scores by 26%, reported mental health scores by 10% and productivity gains by 10 median points.

Key Findings

Using extensive pre- and post-occupancy survey data, the analysis was able to assess the impact of WELL Certification on the people inside a space when compared to their experiences before certification. The study comprehensively analyzed the impacts of WELL Certification on

In the *Journal of Building and Environment*, September 2022

Title:
Impact of WELL Certification on Occupant Satisfaction and Perceived Health, Well-being, and Productivity: A Multi-Office Pre-Versus Post-Occupancy Evaluation

Authors:
Nasim Idris, University of Colorado Boulder
Heather Bazile, Cornell University
Yingli Lou, University of Colorado Boulder
Kathryn Harkins, Pennsylvania State University
Whitney A. Gray, International WELL Building Institute
Wanda Zuo, Pennsylvania State University and National Renewable Energy Laboratory

30% ↗

in overall workplace
satisfaction

10-point ↗

in reported
productivity scores

26% ↗

in reported
well-being scores

10% ↗

in overall
mental health

Table A.3

WELL performance verification results for required WELL features (preconditions) by company.

Parameter	WELL Feature	Measurement (unit)	Threshold	Company					
				A	B	C	D	E	F
Indoor Air Quality	01 Air Quality Standards	Formaldehyde (ppb)	<27	5.2–5.7	25	6–7	15.97–21.4	12–23	10.4–11
		TVOC ($\mu\text{g}/\text{m}^3$)	<500	190–260	340–460	240–330	450–460	130–370	23–38
		Carbon monoxide (ppm)	<9	0	0	0	0	0.1–0.8	0.4–0.6
		PM2.5 ($\mu\text{g}/\text{m}^3$)	<15	1.5–2	0.2–0.23	1	0.2–0.6	3.68–5.49	4.7–5.4
		PM10 ($\mu\text{g}/\text{m}^3$)	<50	2	5.64–7.87	1	7.4–14.6	12.49–37.04	18–30.7
		Ozone (ppb)	<51	0	0	2–3	0	0–7	<10
		Radon (pCi/L)	<4	N/A	N/A	N/A	N/A	<0.6 \pm 0.2	N/A
Thermal Comfort	76 Thermal Comfort	Dry Bulb Temperature	ASHRAE 55-2013	70.2–72.9	73.7–75.2	72.5–76.3	–	72.1–73.5	–
		Mean Radiant Temperature	ASHRAE 55-2013	71.2–73.4	N/A	N/A	N/A	N/A	N/A
		Relative Humidity	ASHRAE 55-2013	61–62.4	37.4–39.5	17.3–22	–	49.8–59.1	–
Lighting	53 Visual Lighting Design	Average ambient light intensity (lux)	≥ 215	567	419	514	628	292	376
Acoustics	75 Internally Generated Noise [†] >†	Open office spaces and lobbies noise criteria (NC)	≤ 40	35–40	38	40	37	36	35
		Enclosed offices noise criteria (NC)	≤ 35	N/A	29	30	17–36	23–36	35
		Conference and breakout rooms noise criteria (NC)	≤ 30	33–36	30–39	28	19–32	23–28	35–40

Featuring major findings from nearly 60 studies



HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH



Wharton
UNIVERSITY of PENNSYLVANIA



Business is
blooming.

01

Healthy Buildings Support a Healthy Economy

Every day, the economy faces steep financial losses due to adverse workplace conditions that affect health and well-being, mental health, productivity and absenteeism.

According to research, these losses create a pervasive drag on national GDP. For example, researchers found that the U.S. **loses \$150 billion every year from sickness-related presenteeism**, which is equivalent to more than 70% of the total cost of lost productivity.³² The U.S. also endures the highest economic losses associated with poor sleep — up to \$411 billion a year, or the equivalent of 2.28% of GDP.³³ In the U.K., employers lose \$30 billion a year from poor employee mental health, which negatively affects absenteeism, productivity and recruitment.³⁴ In terms of missed work, the U.S. **loses more than 175 million workdays** and experiences another 121 million workdays with restricted activity because of four common respiratory illnesses: the common cold, influenza, pneumonia and bronchitis.³⁵ **In Australia, presenteeism is costing the country \$26 billion a year**, while absenteeism costs the country \$7 billion a year.³⁶

Realizing Economy-wide Benefits



Buildings – the places where each of us spends roughly 90% of our lives – must be at the heart of the solution to foster wellness and deliver positive health outcomes at scale, not to mention the many economic benefits for organizations



WE ARE **WELL**

wellcertified.com

Clean Air in Buildings Challenge



FACT SHEET: DEPARTMENTS AND AGENCIES COMMIT TO CLEANER INDOOR AIR ACROSS THE NATION

- **Verify ventilation**
- **Evaluate standards**
- **Real world research**
- **Share new training**

Future(s) Poll



[Slido.com](https://www.slido.com): #HealthInBuildings; Polls and Q&A

The future(s) of health in buildings



Next steps

GSA's Buildings and Health Research Program

- May 23: Health in Buildings Partnerships
- June 27: Circadian Lighting
- July 25: Enhancing Ventilation and Mitigating Dry Air
- Aug 22: Wellbuilt for Wellbeing
- Sept 26: USGBC - Government Health Summit
- Oct 24: NAS Health in Buildings Roundtable Scopeing

This series is a call for co-sponsors - Health in Buildings Roundtable!

- Government agencies, companies, research organizations, non-profit groups, etc
- Pilot, measure, and evaluate health-enhancing strategies
- Share best practices and data between partners

Thank you! Questions?



[Slido.com](https://www.slido.com) - [#HealthInBuildings](#)