



BOMA

**COVID Response and Your
HVAC System: A Roadmap
to Prepare Your Facility**

Today's Presenters



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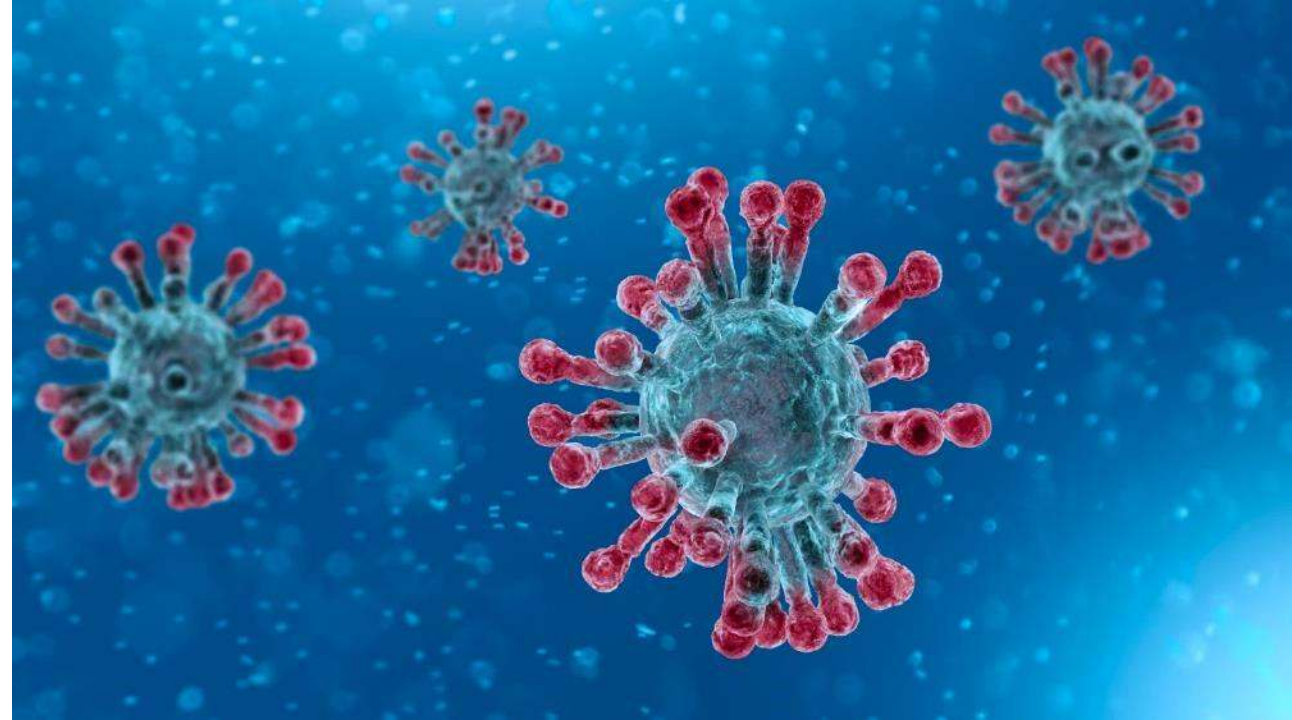
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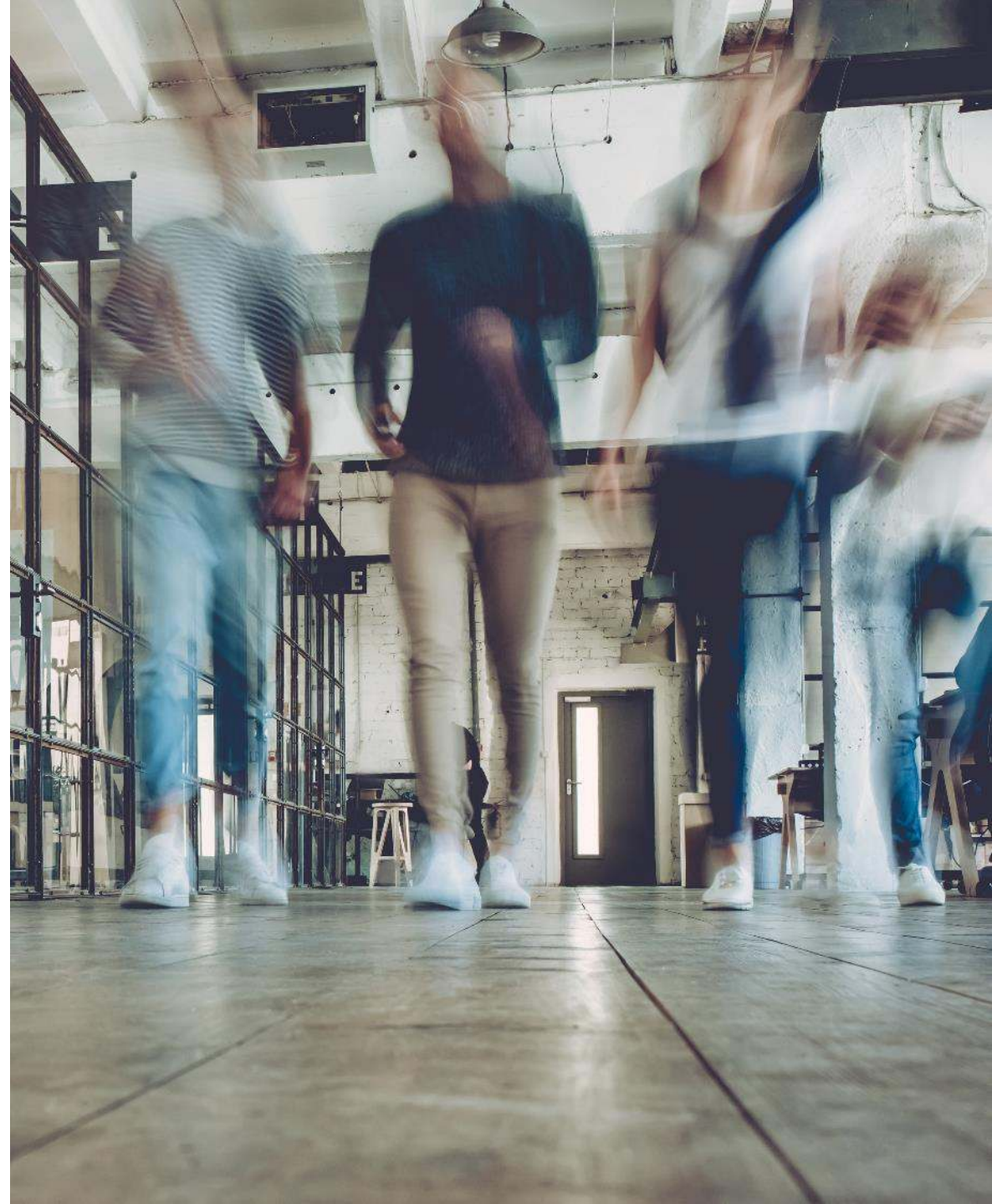
Agenda

- Tenant's Perspective
- COVID-19 and IAQ
- Level 1: Pragmatic Actions to Take Now
- Level 2: Advanced Actions to Consider
- Level 3: Future Actions to Attract and Retain Tenants



Reactivating the Workplace: Tenant's Perspective

- How is the Landlord communicating with the Tenants?
- Is the building being operated at maximum efficiency?
- Has the Landlord taken measures to ensure the health and safety of Tenants and Visitors?



Reactivating the Workplace: Tenant's Perspective

- Can the Landlord provide an independent Certification that the building is safe for use?
- How will the Landlord control building access and manage elevator usage?
- How will the Landlord reduce touch points and practice social distancing?
- How has the Landlord enhanced its cleaning and janitorial operating procedures?



What We Know About COVID-19



Transmission

Modes of Infectious Disease Transmission in a building:

- Person-to-person
- Contaminated Surfaces
- Airborne Transmission



Listen to Dr. Fauci

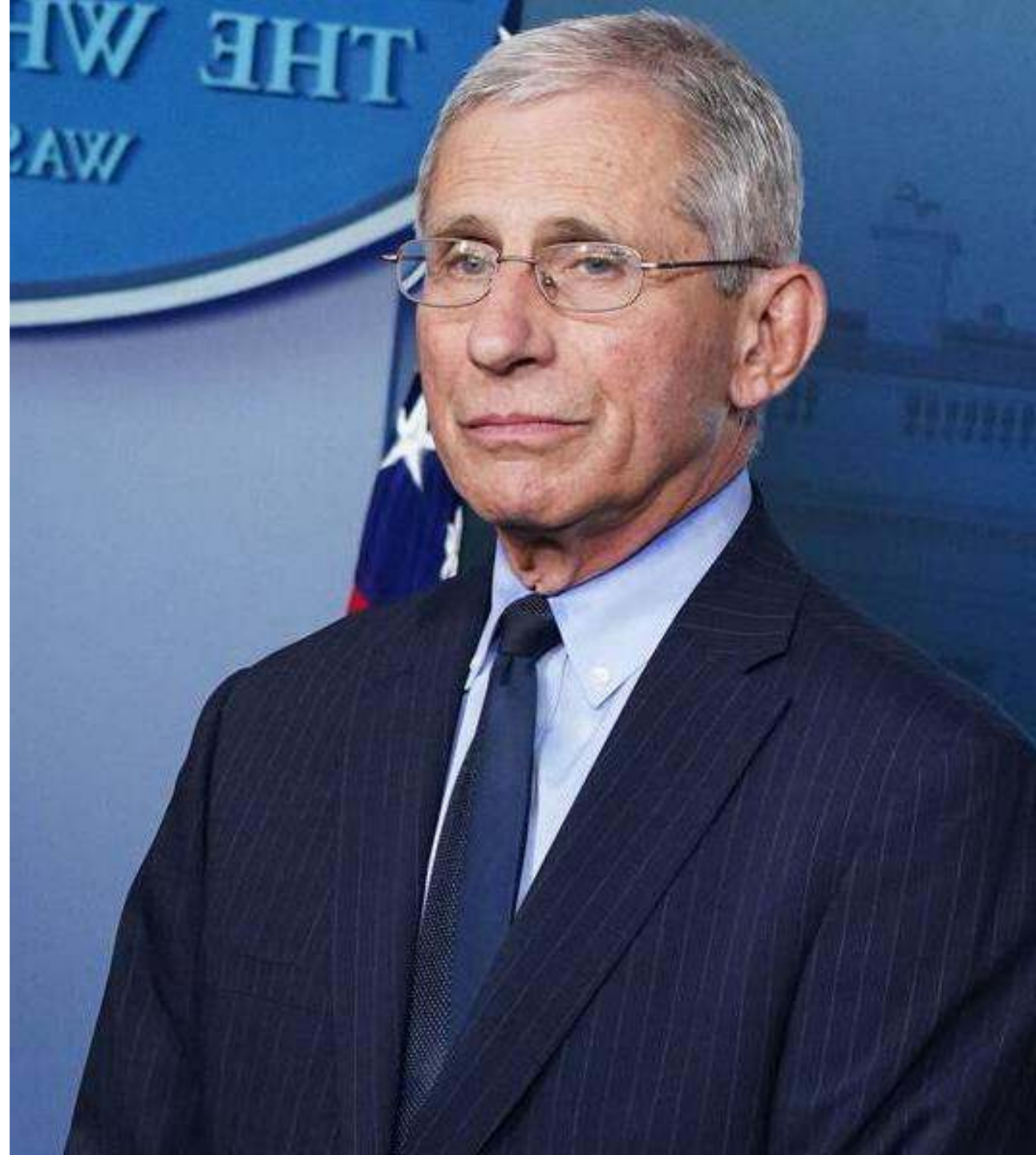
If you're sick, stay home

Don't touch your face

Wash your hands frequently for 20 seconds
with soap and water

Observe 6-feet of distancing

IAQ is important



Level 1: Pragmatic Actions to Take Now

Building Systems

Continue to operate hydronic systems

Continue to operate cooling towers to minimize the propagation of legionella

Pay attention to areas that are unconditioned but may have high occupant traffic (loading docks, back of house hallways, parking garages)



HVAC

Increase ventilation and decrease recirculation

Increase operating hours to increase ACH



Disable recirculation control sequences










































Disable Demand Control Ventilation

Turn on all exhaust fans



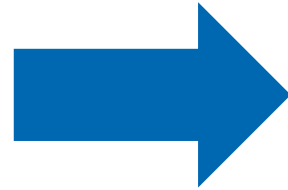
Filtration

-  Efficient at removing particulates
-  Somewhat efficient at removing particulates

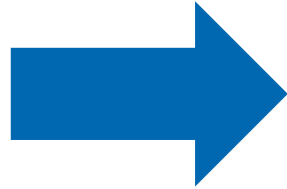
	MERV 8	MERV 11	MERV 13	MERV 14+
PM 10 (Dust, Pollen Wildfires)				
PM 2.5 (Cars, Airplanes, Construction)				
VOCs (Pesticides, Cleaners, Office Equipment)				
Ozone (Sunlight Reacting with Emissions)				
Carbon Oxides (Fossil Fuel Combustion)				
Nitrogen Oxides (Fossil Fuel Combustion)				
Sulfur Oxides (Fossil Fuel Combustion)				
Bacteria				
Mold Spores				
Viruses				
Odors				

What is a MERV rating? (2019, August 1). Retrieved from <https://www.epa.gov/indoor-air-quality-iaq/what-merv-rating-1>
ASHRAE Std. 52.2 TABLE E-1. (n.d.). Minimum Efficiency Reporting Value (MERV).

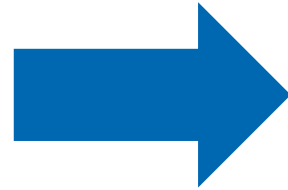
Consider Re-Commissioning?



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Re-Commissioning

3rd Party systematic approach to surveying, testing, adjusting, measuring, and verifying the ventilation and air transfer systems in your facility

“Tune-up the existing infrastructure”

Documents and baselines equipment operations to allow for transparent communication to tenants



Re-Commissioning Process

The Process will confirm the operations of building systems:

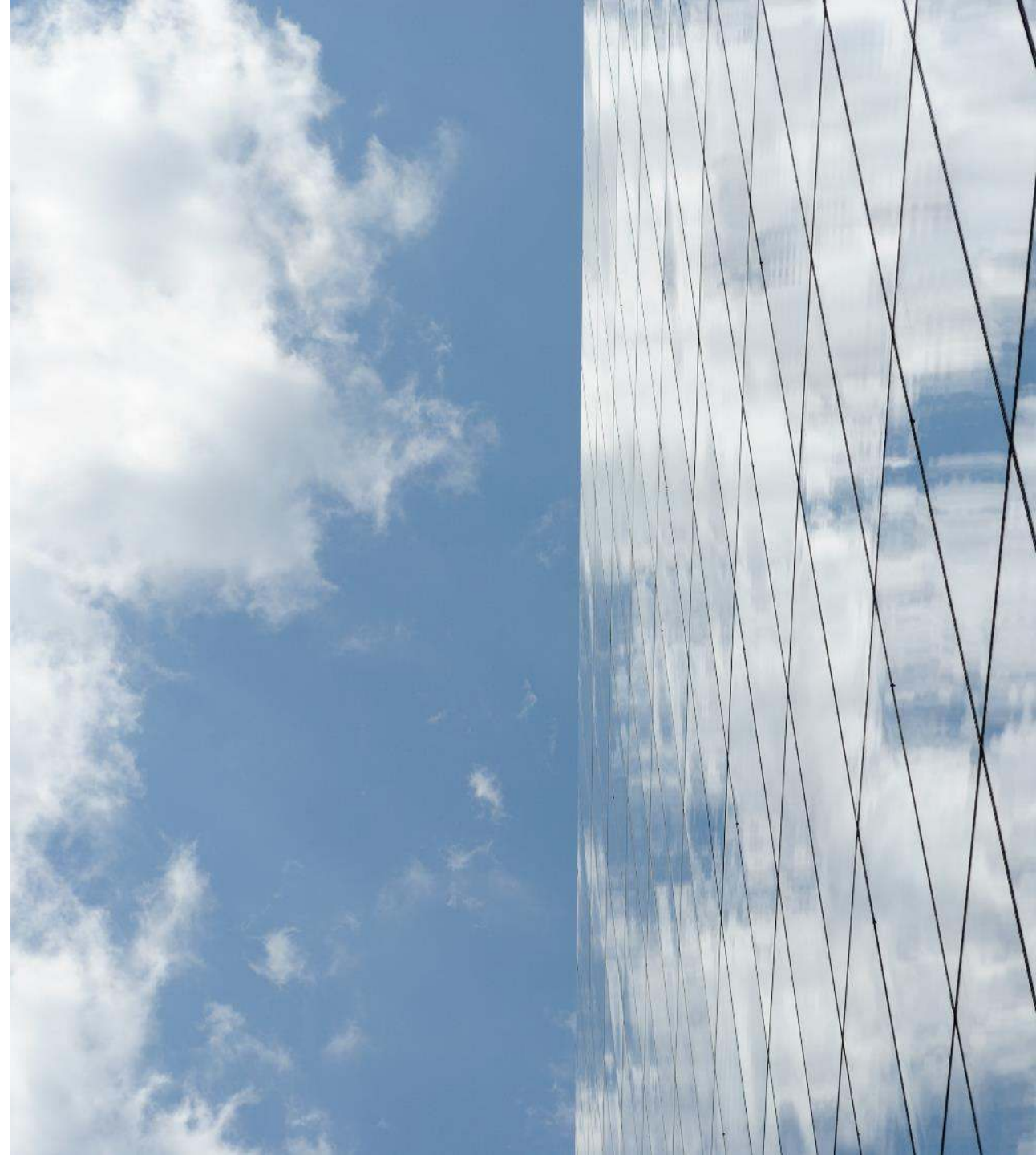
- Visually inspect AHUs/RTUs
- Document equipment sizes and filter ratings
- Modulate Outside Air and Exhaust Air Dampers
- Confirm Fan operations
- Review temperature controls



Ventilation

Calculate the ASHRAE 62.1 or code minimum ventilation for your facility

Hire an Air Balancer to confirm that you are providing the minimum air



Air Cleaning

Air Cleaning Device	Pro	Con
HEPA	<p>Can achieve 99.997% efficiency from 0.30 μm particles which can include unattached viruses</p> <p>Portable devices exist for localized areas</p>	<p>High pressure drops therefore not capable of a "drop in place" replacements to existing filters</p> <p>Should be professionally installed to ensure proper sealings to achieve the high efficiency</p> <p>High costs for O & M</p> <p>Captures particles from the ducted air – not within the space</p>
Ultraviolet Germicidal Irradiation (UVGI)	<p>Effective for disinfecting fluids and surfaces, and inactivating microorganisms</p> <p>Proven to eliminate microbial growth on cooling coils and surfaces of AHUs/RTUs</p>	<p>The medium to be disinfected must move slowly or complete steady state condition; not recommended to put in ductwork or spaces with high air changes</p> <p>Produces radiation. Engage a Professional Engineer to determine appropriate application</p> <p>Requires supplemental power that may not be readily available</p> <p>Captures particles from the ducted air – not within the space</p>

Air Cleaning

Air Cleaning Device	Pro	Con
Carbon Filters	Effective at removing odors, gases, and grease	High pressure drops Not able to capture small particles
Ionization	By ionizing the airstream, virus, bacteria, and particles they will begin to "clump" which allow media filters to capture them	Newer technology that still has limited applications Currently difficult to measure effectiveness of virus/bacteria/particle reduction over a typical filter Captures particles from the ducted air – not within the space

Air Cleaning

Air Cleaning Device	Pro	Con
Photocatalytic Oxidation (PCO)	<p>Same application and performance as UVGI</p> <p>Effective for eliminating bacteria and viruses in airstreams</p> <p>Lower Pressure Drops</p>	<p>Increase in energy from the lamp</p> <p>A byproduct of the lamp type (ie: UV-V rays) is the generation of ozone in the airstream</p> <p>Potential of incomplete oxidizing process which can produce toxic byproducts</p> <p>Captures particles from the ducted air – not within the space</p>

Level 2: Advanced Actions to Consider



IAQ Devices

Devices that measure the IAQ of a space

Measure:

- Temperature
- Relative Humidity
- CO₂
- PM 10 and PM 2.5
- TVOC



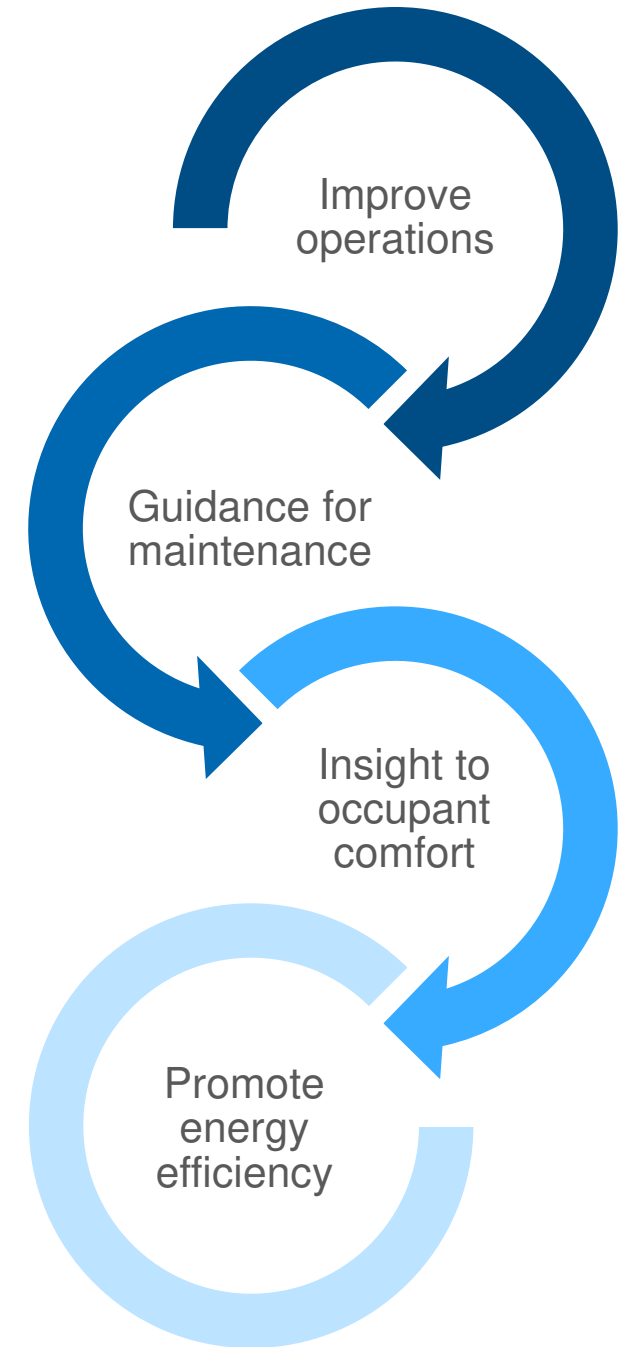
Air Quality Measurements

Parameter	Why Track?
Temperature	Important to monitor as our understanding of the virus increases, certain temperature ranges may reduce its transmission
CO2	When tracked relative to the outside air CO2 will provide confirmation adequate amounts of outside air is provided
PM 10	Tracking of particles with diameter 10 pm or less Confirm the effectiveness of a filter
PM 2.5	Tracking of particles with diameter of 2.5 pm or less Confirm the effectiveness of a filter
Humidity	There have been studies that show slightly elevated Relative Humidity (40%-60%) levels can increase the human body's defenses to fight a virus


Monitoring-based Commissioning

Using software to acquire and analyze Building Systems performance data on a continuous basis

- Track total airflow and air changes
- Guide facility team to address spaces with low ventilation or space temperature issues (Proactive Maintenance)
- Operate a building based on data to reduce potential energy penalties
- ComEd incentives available



Level 3: Future Actions to Attract and Retain Tenants



Certification

Certification measures and validates actions that support health and wellness

A mechanism to separate a facility from others to retain and attract tenants

Seeing tenants considering incorporating certifications into their leasing requirements



H&W Certifications



GOOD: FITWEL CERTIFICATION

SOFT COSTS: \$0.19/SF (fixed)
FITWEL Certification Fees,
FITWEL Consulting Fees

HARD COSTS: Sit/Stand Desks, Quiet Room, Mothers Rooms, Signage, Nutritional Vending Machines

NOTE: Best to be located in a LEED V4 EBOM Certified Building. Best to be located near transit and parks.

CERTIFICATION PRICING:
<https://www.fitwel.org/certification/>

BETTER: RESET CERTIFIED

SOFT COSTS: Avg \$0.17/SF (varies by SF)
RESET Certification Fees , RESET Consulting Fees, Preliminary IAQ Test (~\$3k)

HARD COSTS: IAQ Sensors (\$900 EA/YR)

NOTE: Best to be located in a building with MERV 13 filters, a green cleaning program, and low emitting tenant furniture & finishes. Annual recertification.

CERTIFICATION PRICING:
<https://www.reset.build/certification>

BEST: WELL V2 CERTIFIED

SOFT COSTS: Avg \$.80/SF (varies by SF)
WELL Certification Fees, WELL Consulting Fees, Preliminary IAQ, Acoustics and Water Test (~\$10K)

HARD COSTS: Same as FITWEL plus desk fans and task lights

NOTES: Easier if no cafeteria and all glass exterior with a VLT >40%

CERTIFICATION PRICING:
<https://www.wellcertified.com/certification/v2/pricing>

How to Proceed



Current Challenges

Time is short

Money is tight

Costs are increasing

Lead times are getting longer



Time Saving Approach

First 3 Days:

- On-Site Assessment
- MEP Design
- Budget
- Confirm Lead Times
- Schedule



Cost Reduction Strategies

Leverage the portfolio (vs. individual buildings)

Buy directly from manufacturers



**Questions or
Comments?**



Thank you

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