ENERGY MANAGEMENT ASSOCIATION

WEBINAR

AIA Provider Number: 50111157

Course Number: APPA20200806

The Future Isn't What it Used to Be: Occupied Space in the Covid-19 Era

With your panelists

Wade Conlan, P.E., CxA
Cx & Energy Discipline Manager
Hanson Professional Services Inc.

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Project Manager
TLC Engineering Solutions

Justin Garner, P.E., CxA, TBE
Vice President
Engineered Air Balance

James Moore
COO and Exec. VP
Brightline

AABC

acg AABC Commissioning Group

EMA ENERGY MANAGEMENT ASSOCIATION

AIA Continuing Education Provider

LEARNING OBJECTIVES

- Understand the implications of COVID-19 on the future of occupied spaces on matters of codes, regulations, best practices in O&M, etc.
- Learn how energy services providers are responding to COVID-19 challenges with their existing clientele and are preparing for future service demands with new offerings and immediate needs created by reconfigured spaces.
- Understand the immediate implications of COVID-19 on basic matters of ventilation, filtration, air flows, workplace distancing, humidification, etc. based on current and emerging science.
- Using contemporary survey data, understand the concerns, challenges, and current demands facing building owners and facility managers to reopen and operationalize spaces in the "new normal."

AGENDA

- Introductions
- Short Presentation by each Panelist
- Question and Answer

PANELISTS

- Wade H. Conlan, PE, CxA, BCxP, LEED AP
  - Hanson Professional Services, Inc.
- Justin Garner, PE, CxA, TBE
  - Engineered Air Balance
- Eric McEwen, CxA, EMP
  - TLC Engineering Solutions
- James Moore
  - Brightline Strategies

Wade Conlan, PE, CxA, BCxP, LEED AP

Hanson Professional Services, Inc.

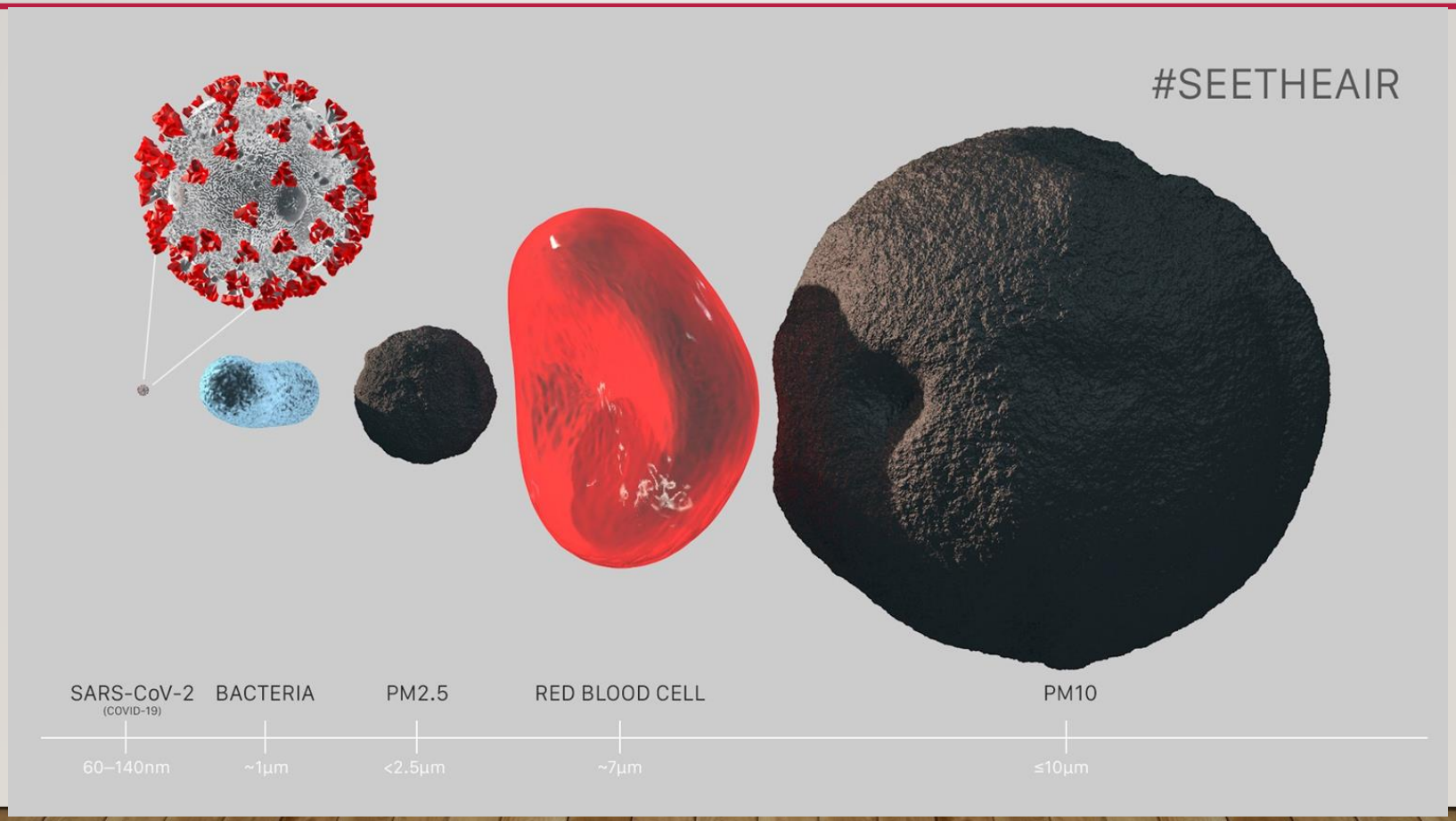
BUILDING READINESS: INTENT

- Create practical guidance for how your building is operating, should be operating and how to practically check its operation.
- Understand Modes of Operation:
  - Epidemic Conditions in Place (ECiP)
    - Occupied- at pre-epidemic capacity
    - Occupied- at reduced capacity
    - Unoccupied temporarily, and
    - Operation during building closure for indefinite periods
  - Post-Epidemic Conditions in Place (P-ECiP)
    - Prior to Occupancy
    - Operational Considerations once Occupied

BUILDING READINESS: TEAM

- The following are the typical service providers that may be required:
  - Commissioning Provider (CxP)
  - Test and Balance Company (TAB)
  - Building Automation Systems (BAS) Company
  - Contractors
  - Architect and/or Engineer (AE)
  - Owner's Facility Staff
  - Building Operations

WHAT ARE WE BATTLING?



ENGINEERING CONTROLS

- Methods
  - Ventilation
  - Filtration
  - Air Cleaning (UVGI and others)
  - Temperature and humidity control
  - Air distribution effectiveness
- Air cleaner effectiveness – describes incremental effect of a control

$$\varepsilon = \frac{C_{uncontrolled} - C_{controlled}}{C_{uncontrolled}}$$

- Combinations of controls can be synergistic
  - MERV 13 rated filter + UV (at 85%) can approach HEPA performance
- Some are mutually exclusive
  - Displacement Ventilation + Upper Room UV
- Some are additive, but trade off
  - Increased Ventilation + Air cleaning

Nazaroff, W. 2000. Effectiveness of Air Cleaning Technologies. *Proc. of Healthy Buildings 2000.*

Justin Garner, PE, CxA, TBE

Engineered Air Balance

TESTING, ADJUSTING AND BALANCING (TAB)

- Independent Firms, such as AABC Members, should work directly for the Owner, Design Team or Cx Provider
- AABC Member Firms provide Total System Balancing which includes technical expertise and verification of control systems in addition to air, hydronic and plumbing systems balancing
- The TAB Firm is a critical member of the building readiness team by providing:
  - Physical measurements of ventilation airflows, filtration pressure drops, and equipment capacities
  - Control point and sensor calibration verification
  - Direct input to the Owner and Design Team to make decisions on actual operating data and control sequence changes

TESTING, ADJUSTING AND BALANCING (TAB)

- Recommended Services for Pandemic Response:
  - Outside Air / Exhaust / Air Change Rate measurement
  - Airflow Monitoring calibration verification
  - Filtration pressure drop measurement
  - Actual fan system curves based upon connected load
  - Space air change modifications for public and high occupancy areas
- Measurements need to be taken at all operating points from design maximum airflow to minimum airflow

ERIC MCEWEN, CXA, EMP

TLC ENGINEERING SOLUTIONS

RE OR RETRO COMMISSIONING - PROCESS

- 1st step is to perform onsite assessment of existing conditions
  - Physical equipment assessment
  - BAS assessment
- 2nd step is to evaluate possible Covid-19 mitigation strategies
  - Upgrade filters
  - Implement pre and post occupancy flush sequence
  - Space humidity control
  - Consider utilizing technology such as UV-C lights

RE OR RETRO COMMISSIONING – ONSITE ASSESSMENT

- Physical equipment assessment
  - OA Damper operation
    - Does the damper fully stroke open and closed and is not stuck?
  - OA Damper Airflow (assistance from TAB)
    - Confirm OA measured airflow matches BAS
  - Sensor Calibration (assistance from TAB)
    - Confirm temp and RH sensor calibration
  - Are RH sensors installed? If so, note location.
  - What filters are installed?
    - Have they converted to MERV 8 to save money on filters?
    - How dirty are they?
    - Are filter blank-offs installed as required?
- BAS assessment
  - Review occupancy schedule
    - Is there an occupancy schedule implemented?
    - Does it match the building occupancy?
  - Review OA setpoints.
    - Do they match design max values?
    - Has OA damper been overridden to 100% open or closed?
    - Is DCV implemented? Consider disabling
  - SA Temp Reset Implemented?
    - Consider increasing OA in lieu of SA temp reset.

RE OR RETRO COMMISSIONING - POST ASSESSMENT MITIGATION RECOMMENDATIONS

- Upgrade filters to minimum MERV 13 with MERV 16 being preferred
  - Additional consequences may arise if equipment fans are not large enough to handle additional static (which will be reviewed during site assessment)
- Implement pre and post occupancy flush
  - Running HVAC at design OA before occupancy schedule and after occupancy schedule
- Control space RH between 40%-60%
- Review additional technology like UV-C lights to see if they make sense for the project's specific application.

James Moore

Brightline Strategies

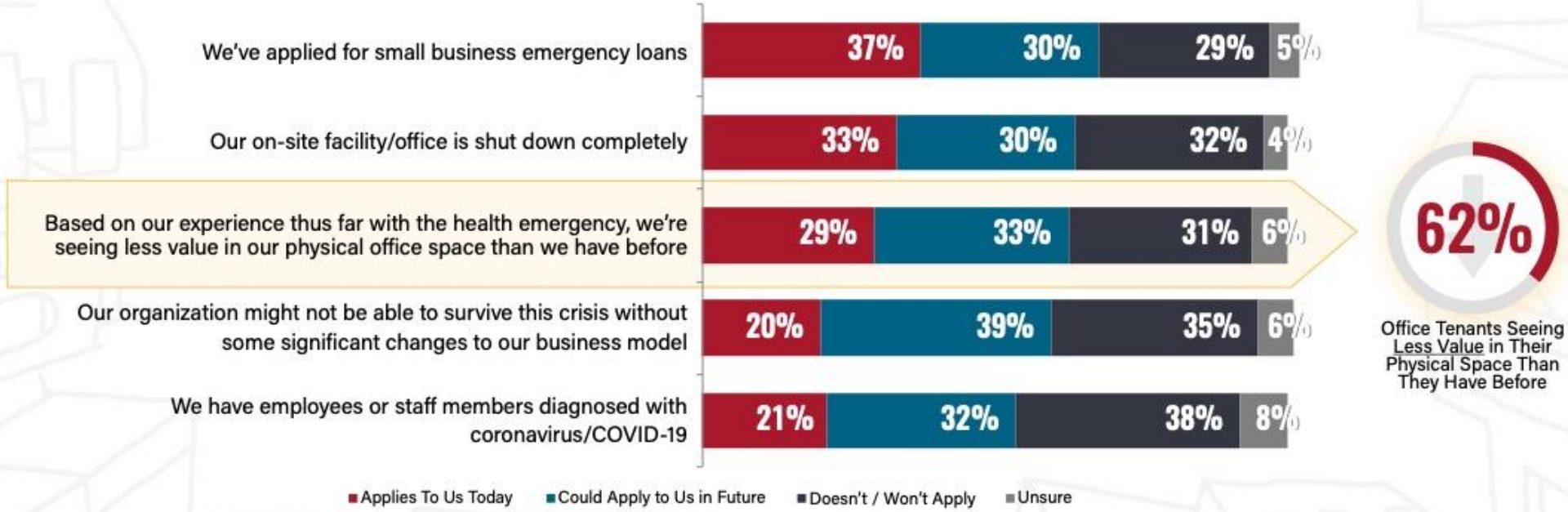
COVID-19 COMMERCIAL IMPACT

Office Tenant Impact Survey Debrief
EMA-APPA Virtual Summit
August 6, 2020

TENANT IMPACTS: BUSINESS PERFORMANCE AND REACTIONS

OFFICE TENANT ACTIONS-REACTIONS

- More than 6-in-10 office tenants are seeing **less value** in their physical space following coronavirus impacts and social distancing measures.
- Driving "less value" attitudes initially are VPs and Directors (72% less value), technology industry (82%), offices between 25,000 and 50,000 square feet (74%), and mid-range rent per square foot levels (76% among $40-$60 PSF – these are organizations "on the cusp" of growth, including start-ups (83%) and scale-ups (91%).

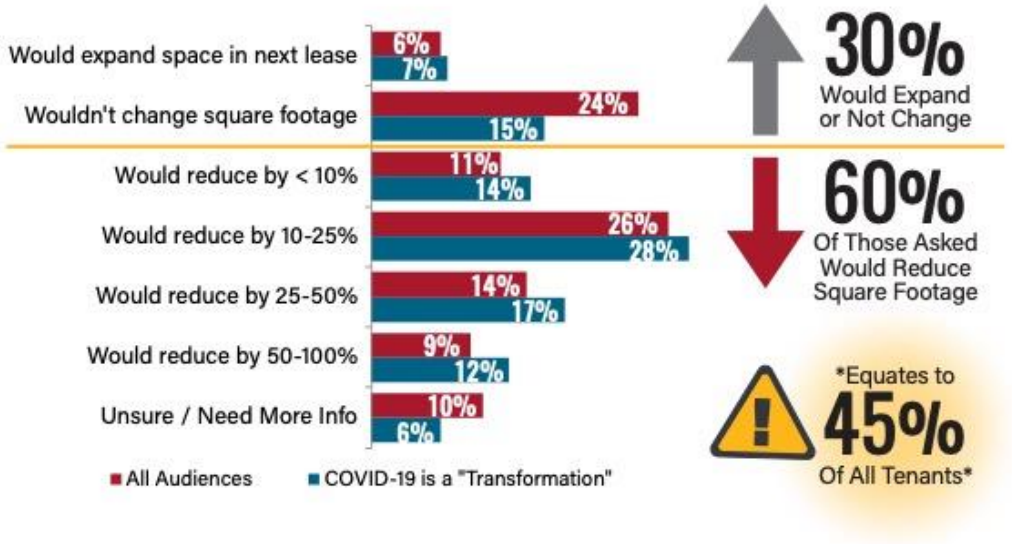


WHAT DOES REASSESSING SPACE NEEDS LOOK LIKE?

- Among the 75% of the office decision-maker/user population predicting a reassessment of space needs or who are unsure, 60% would reduce their square footage, amounting to **45% of all tenants in the sample.**
- Most cited changes include reducing private office numbers and sizes, reducing the size of common areas–and for larger firms–adding in hoteling desks, reducing conference rooms and going to a full open floorplan layout (likely with 6-feet of separation, dividers, etc.) – spreading workers out with excess space from eliminating private offices.

Office Square Footage Adjustment Post-Coronavirus

(Asked Only Among Respondents Likely to Reassess Space Needs or Who Were Unsure)



How Would You Reduce Space / Increase Efficiency?

(Asked Only Among Those Who Would Reduce Square Footage)

	All	1,000 - 5,000 SF	5,000 - 10,000 SF	10,000 - 25,000 SF	25,000 - 50,000 SF	>50,000
% OVERALL LIKELY TO REDUCE SQUARE FOOTAGE	60%	50%	57%	68%	82%	65%
Reduce number of private offices	29%	33%	34%	23%	41%	13%
Reduce private office size	28%	40%	25%	21%	33%	27%
Reduce size of common areas	27%	20%	41%	23%	30%	20%
Reduce number of employees (reductions in force)	25%	17%	38%	25%	22%	20%
Add in hoteling or flexible desks for teleworkers	25%	13%	19%	29%	30%	33%
Reduce number of conference rooms	22%	13%	16%	25%	37%	13%
Go to a full open floorplan layout	22%	13%	16%	21%	33%	40%
Reduce size of conference rooms	21%	17%	19%	21%	19%	40%

Q: Based on your experience with staff reductions and/or teleworking during the coronavirus/COVID-19 public health emergency – whether or not you stay in your current property – would you plan on making your space more efficient or reducing the total square footage of your space?

Q: In order to change your office space needs, which of the below would you do and/or which factors would apply to achieve that square footage reduction? (Please select all that apply)

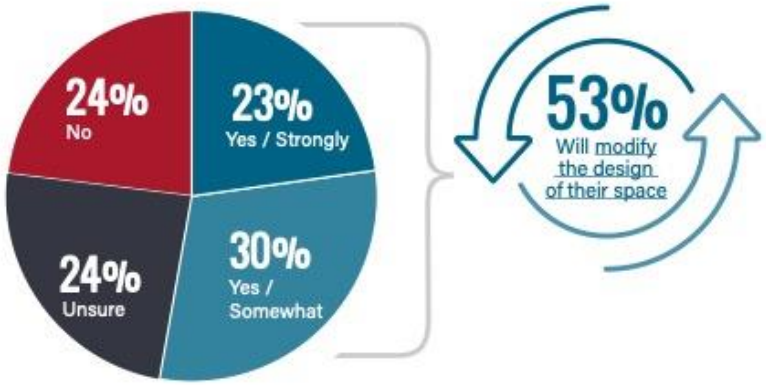
NEXT STEPS: REOPENING PROPERTIES

TENANT VIEWS ON REOPENING SAFELY/SECURELY AND EFFICIENTLY

- Even if many tenants won't reduce their square footage, a majority **will potentially alter the design of their space to accommodate social distancing,** with the most cited changes including reducing the number of bullpen desks, splitting larger offices with temporary partitions, and converting conference room spaces to offices.
- While social-distancing strategies like universal mask wearing, a staggered return schedule and enforcing occupancy limits are seriously under consideration, fewer firms are considering full company splits (into A vs. B teams for staggered work weeks) and expanding working hours/shifts **(which means less need for expanded HVAC and on-site support for owners/operators).**

Social-Distancing Design Changes

Are you planning to modify the design of your space for social distancing?

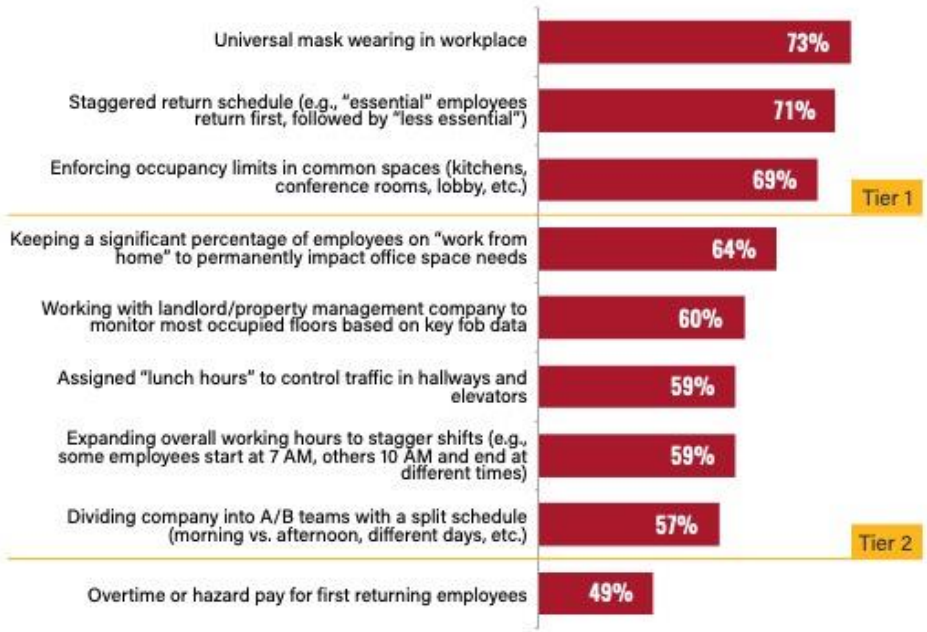


Top Design Changes (Allowing Multiple Responses)

40% Reducing number of bullpen desks/cubes and spreading apart	**35%** Splitting larger office with temp. partitions or permanent walls
34% Converting conference rooms to offices / isolated work stations	**30%** Reducing office lobby / greeting area size and incorporating a desk

Social-Distancing Strategies in Action

Which of the Following Would You Implement?

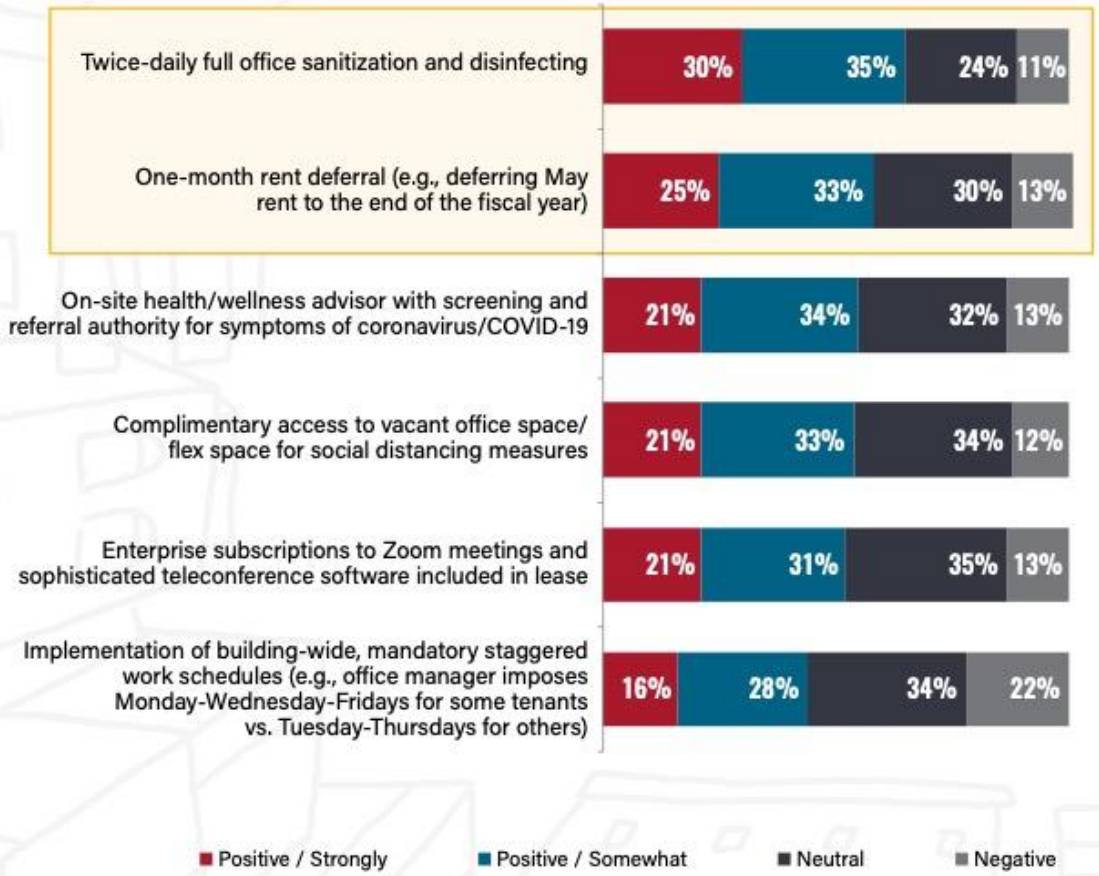


Q: "Think about the reopening of your office and/or employees' reentry into your physical space. What are some of the strategies you or your organization plan on implementing to address employee concerns or fears about coming back to the workplace? Please select all that apply."

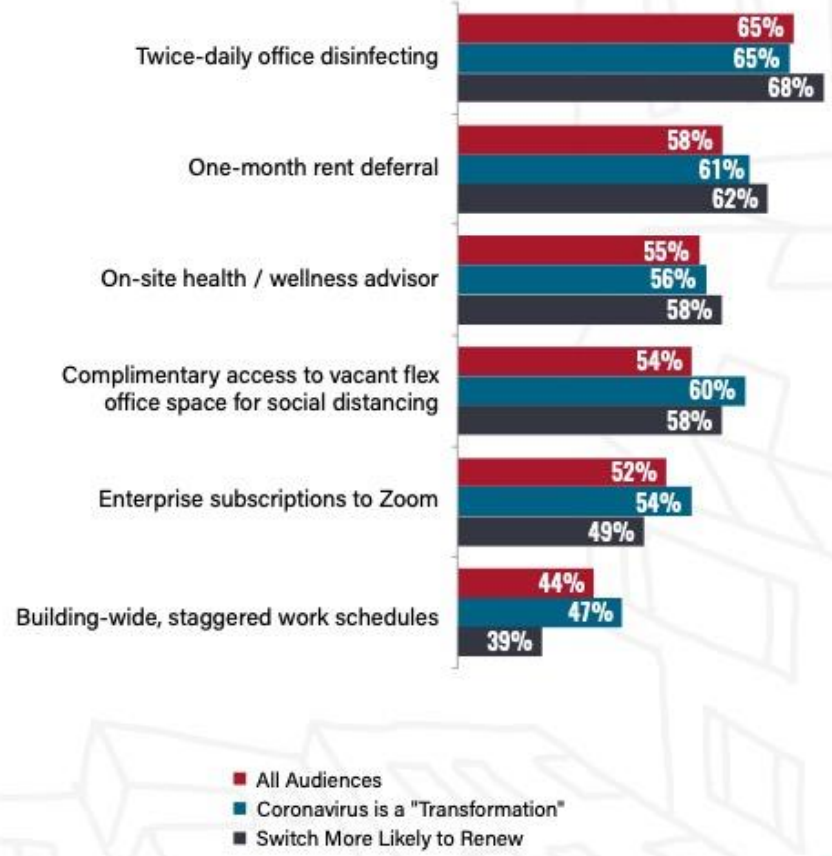
NEXT STEPS: NEAR-TERM AND LONG-TERM CHANGES

NEAR-TERM FEATURES, SERVICES AND PROGRAMMING

Near-Term Features - Sorted by Strongest "Positive" Reactions



Near-Term Features Among Target Audiences
(Sum of Positive Reactions Only)



ENERGY MANAGEMENT ASSOCIATION

QUESTIONS?

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