



Smart Buildings, IoT, and the Office after COVID

Background and Supplemental Information

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About Joe Aamidor, Aamidor Consulting

- 15+ years in buildings, real estate, IoT, energy management, built environment
- Work with smart building innovators, investors, and real estate operators
- Publish the bi-monthly Smart Building Insight newsletter, covering M+A, investments, product launches and reports/news.
- Routinely speak at events around the world; Authored dozens of articles in industry publications like PropModo, CRETech, GTM, BuiltWorlds
- www.aamidorconsulting.com



Smart Building technology touches all parts of the facility

Key building systems may be 10+ years old and ripe for upgrade. Is Covid-19 the catalyst?

Smart building technology typically:

- Is technology enabled, data-driven
- Supplements current operators, tenants, owners
- Prioritizes outcomes, such as:
 - Operational efficiency
 - Resource efficiency
 - Utilization
 - Health/Wellness
 - Productivity/Value
 - Experience



ASHRAE and CDC Guidance on Covid-19 indicates that HVAC will play a key role.

ASHRAE:

"Ventilation and filtration provided by heating, ventilating, and air-conditioning systems can reduce the airborne concentration of SARS-CoV-2 and thus the risk of transmission through the air."

CDC:

"Take steps to improve ventilation in the building:

- Increase the percentage of outdoor air potentially as high as 100%
- Disable demand-control ventilation (DCV) controls that reduce air supply based on temperature or occupancy
- Improve central air filtration to as high as possible (MERV 13 or 14)
- Consider running the building ventilation system even during unoccupied times to maximize dilution ventilation"

CRE Response: There are some big questions ahead for the industry. Time will tell...

There are a number of considerations, including:

Business-
focused

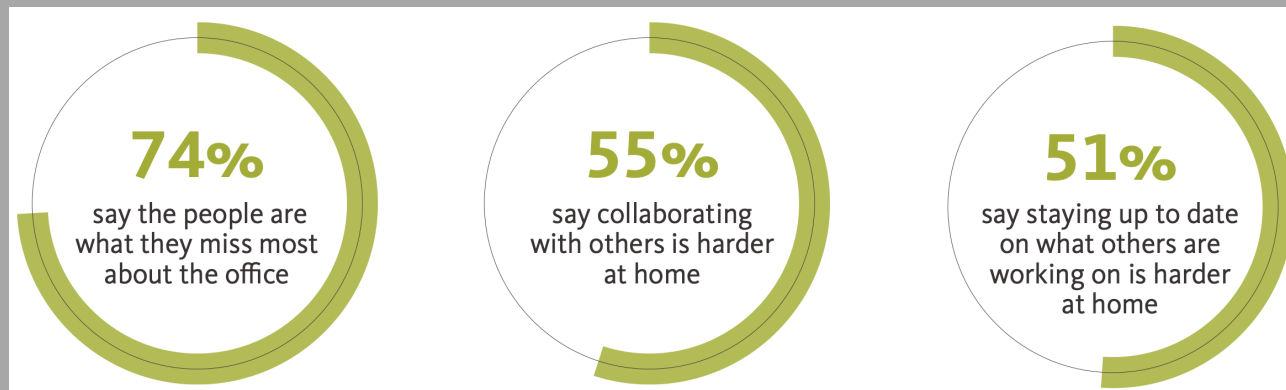
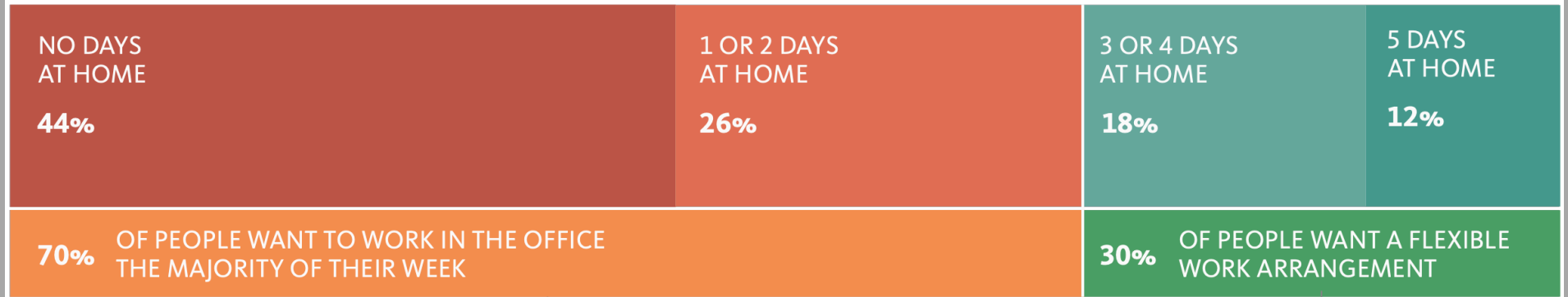
1. When are offices repopulated? How many people return? Or, are employees encouraged or allowed to work remotely?
2. How are the financials of the CRE firm (or the corporation that owns the space) impacted?

Building-
specific

3. How are decisions on new capital / operating expenses made?
4. What low cost alternatives exist?
5. Which vendors and service providers have the most compelling offerings?
6. What innovative new products are offered in the near future?

CRE Response: Will office workers come back? Early signs are that they will, eventually.

DO YOU PREFER TO GO BACK TO THE OFFICE OR CONTINUE TO WORK FROM HOME?

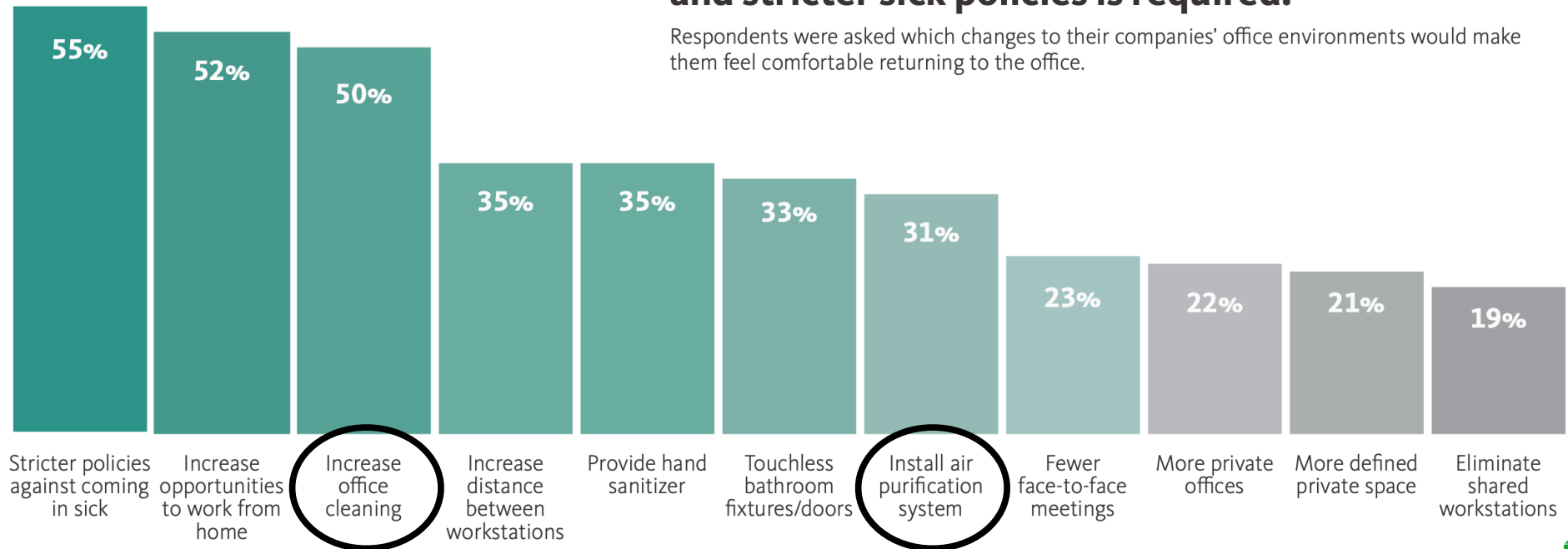


Gensler Research Institute surveyed 2,300 US office workers in late April/early May. Firms of 100 employees or more. 10 industries, all seniority levels.

CRE Response: Office workers do expect a range of changes, some of which will drive new equipment and services.

For people to feel comfortable coming back to the office, a combination of more space, more cleaning, and stricter sick policies is required.

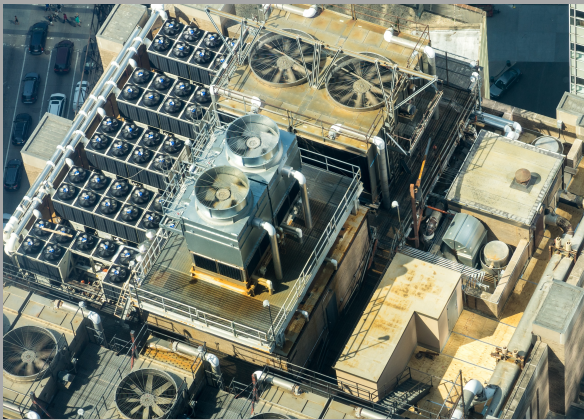
Respondents were asked which changes to their companies' office environments would make them feel comfortable returning to the office.



Gensler's survey touches on general office operational expectations. This may be because workers are less knowledgeable of how operational equipment/systems can improve the safety in the office.

Covid-19 Impact: Which systems are impacted? There are a few that likely will see increased deployment and use.

HVAC/Air Filtration



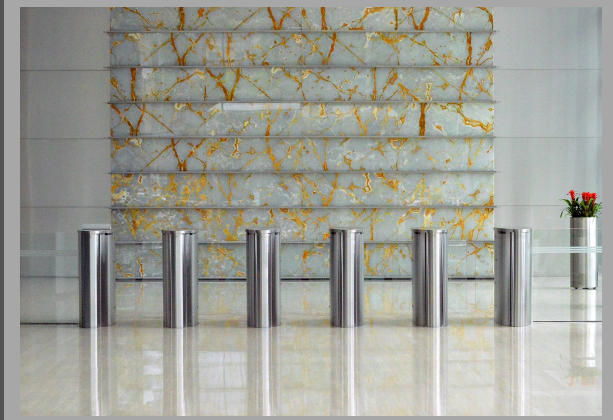
- More runtime to increase air flow, filtration, outside air
- Service calls manage increased HVAC use
- Capital improvements?

Lighting



- Lighting + integrated UV lighting may provide capabilities to clean indoor spaces
- Many buildings already have deployed LEDs.

Access Control



- Can serve as first line of defense for visitors and to monitor occupancy
- More advanced sensors can track movement in spaces

A killer app? It's uncertain, but systems to collect and analyze better data (real time, granular, accessible) across various operational systems, is foundational.

The Covid impact on smart building adoption is unclear, but includes pros and cons

Tailwinds

- Increased indoor air quality: more filtration and ventilation
- Increased maintenance of systems requires truck based service (and more runtime = more service)
- Energy use increases due to less consistent use of buildings (open schedules), which drive retrofits and data analytics

Headwinds

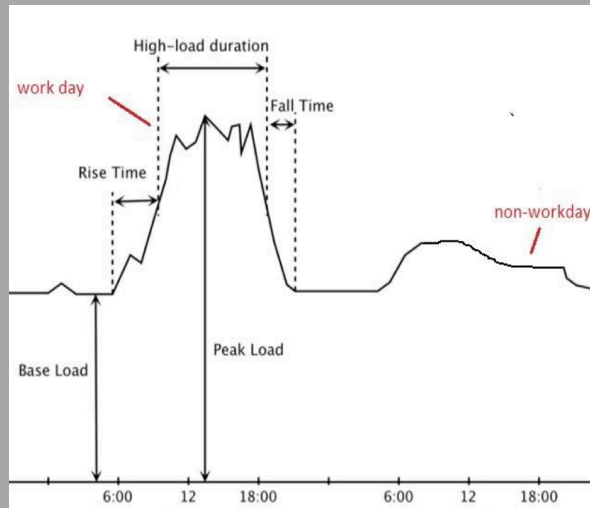
- Lower rents and lower occupancy rates drive building owners to delay/pass on capital investments
- "Simple alternatives" are selected instead - more run to failure, more deferred maintenance, more human intervention in control systems

Initial facility management responses to Covid-19 have included:

- Address deferred maintenance while building is empty
- Remote connection to operational systems to support remote work of facilities team
- Prepare to reopen (readiness) / ensure building does not fall into disrepair

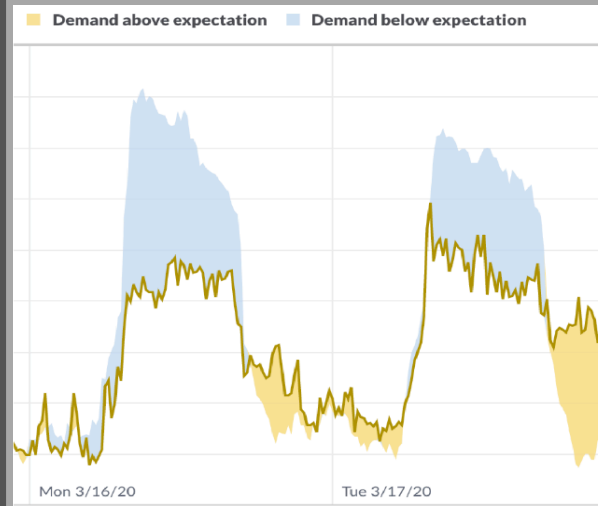
Changing Building Operations: If workers stagger their use of the facility throughout the day, equipment runtime may rise

Before Pandemic



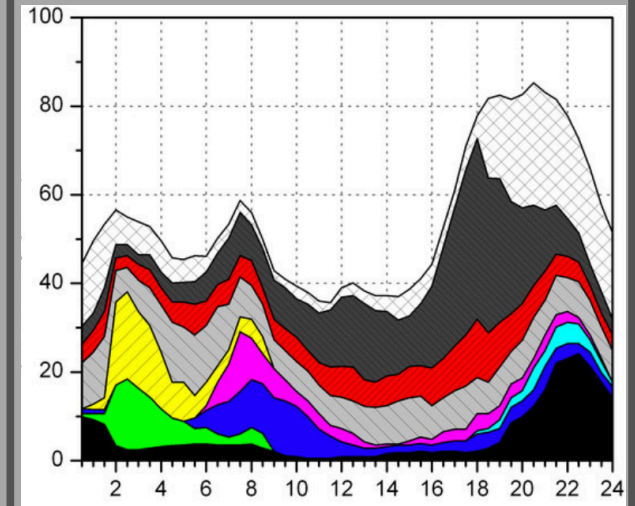
- Well-managed schedule
- Aligned with business hours and working days
- Simple analytics technology to identify efficiency opportunities

During Pandemic



- Buildings may realize ~30 percent drop in energy use
- Critical systems remain in use, but peaks are reduced

After Pandemic?



- “Always open” or “usually open”
- ?? percent change in energy (+/- ?)
- Modified operations = more data/sensors

Building Lifecycle: Opportunities for growth in smart buildings across the cycle, but no single, clear entry point

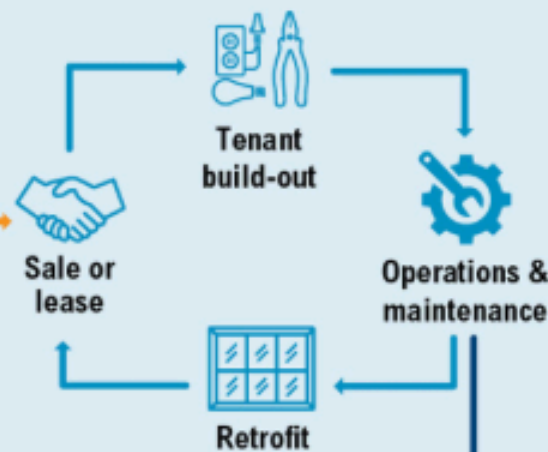
- More demand for buildings would drive construction, which may integrate more technology and health features
- However, this may be less likely in an economic contraction.

- Tenants could demand more touchless amenities, air quality enhancements - during the build out process.
- This would happen more frequently with new tenants. And, these enhancements may not be deep enough to impact major OEMs.

NEW BUILDINGS



EXISTING BUILDINGS



Deconstruction or demolition

- Energy savings could fund the deployment of better HVAC systems and other health/wellness
- Under this scenario, payback periods would be less compelling

- Equipment upgrades may be required, but they may not make up for the potential loss in new construction. Truck-based services should see growth due to more maintenance from increased runtime.
- That said, many facility managers can do some of the work on their own, without vendor support.

Impact on key players should be positive in the long-term; after offices are reoccupied and some normalcy returns

- Risk aversion: for facility operators seeking to reduce risks, they may be more apt to work with established, well-known firms
- Channels to market: existing OEMs have the most established go-to-market positions in the market
- Robust service capabilities: truck-based services as a first response
- Financing opportunity? Performance contracting may support new models that fund indoor air quality upgrades with energy savings.
- Startups: Oversized role in innovation and feature set, but limited market penetration. Currently appear stable, but late 2020 pipelines are light, which may indicate future challenges.

About Us - Aamidor Consulting: Experts in Smart Buildings

- Strategic and market insight for investors: commercial due diligence, review of/feedback on investment thesis
- Product strategy for vendors (small and large): competitive intelligence, voice of customer research, market sizing, go-to-market
- Market research for enterprises and industry stakeholders: provide an independent, data driven perspective on the industry, opportunities for growth, current and future trends
- Advisory services for real estate owners/operators: technology adoption strategy development, procurement support

For More From Aamidor Consulting

Past Projects:

- For a private equity firm, helped develop an investment thesis in the smart buildings space and identify target firms to bolt-on to existing portfolio companies.
- For a venture capital firm, conducted commercial due diligence for an investment in a building and facility management cloud-based software firm. This included a review of the roadmap, assessment of the leadership team, and validation of the total addressable market opportunity.
- For multiple building technology startups and vendors, developed initial business cases and reviewed initial market opportunities for adjacent and bolt-on business units.
- For real estate firms and their trusted advisors, developed a scope of features and functionalities for facility, energy and building management software products. Described key functionality, data acquisition capabilities and developed a pricing framework to ensure that vendors would provide consistent pricing guidance with their bids.

[Subscribe to our bi-monthly newsletter](#) on the smart building market (or available here: <http://eepurl.com/c7nrtv>)

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Thank You!!