



AWAIR

+



WEBCOR

How Webcor used Awair to promote employee safety on jobsites

In response to the pandemic, Webcor, a leader in commercial construction, used Awair Omni to assess the risk of indoor contaminants and virus transmission on a jobsite. By extending their indoor air quality monitoring program from the office into the field, they ensured the wellbeing of their staff—no matter where they work.

ASSESS

how differing environmental conditions impact workers on jobsites.

ACT

on insights to protect workers and reduce the likelihood of disease transmission with responsive mitigation strategies.

EXTEND

the data into other projects and construction activities to understand the link between air quality and health and safety.

ABOUT THE COMPANY

Webcor is a premier provider of commercial construction services, known for its innovative and efficient approach, wide range of experience, cost-effective design-build methodology, skill in concrete construction and expertise in building landmark projects. Webcor's mission is to build structures of superior quality with integrity, continuously improve its processes by employing the best talent in the industry, and add social and economic value to its communities. The company was founded in 1971 and is repeatedly honored as one of the Greenest Builders in California, Healthiest Employers, Top Corporate Philanthropists, Best Places to Work, and Largest California Construction Firms.

“

We want to start focusing health and wellbeing efforts on our more normalized staff, labor foreman and field workers, just like we do within our office and department operations.”

—GREG ALVES, SAFETY MANAGER

BACKGROUND

During the COVID-19 lockdowns, the foreperson at Webcor wanted to be sure the company could mitigate the risks of indoor contaminants within their jobsites. He wanted to protect his workers and apply precautions to reduce the likelihood of spreading the disease.

The goal was to use the AWAIR monitors to track indoor air quality factors so Webcor could make changes to their jobsite operations. Since jobsites typically lack reliable access to power and connectivity, the Webcor team devised a way to log air quality data to external flash memory using Awair Omni's "Offline Data Backfill" capability. This feature enables one-minute sensor data averages to be cached anytime Omni is disconnected from the internet.

“Safety is our number one goal at Webcor, and we felt it was necessary to see how our operations affect the health of those individuals most essential to building the amazing structures you see from Webcor,” said Greg Alves, Safety Manager. **“We want to start focusing health and wellbeing efforts on our more normalized staff, labor foreman and field workers, just like we do within our office and department operations.”**

CHALLENGES

- Webcor wanted to use the San Francisco construction project at 830 Eddy, a residential high-rise building, to understand how differing environmental conditions impacted its workers.
- They wanted to track how construction activities with their self-perform Webcor Carpentry and Webcor Drywall teams impacted air quality factors, such as PM2.5.
- They also wanted to know how the air quality factors were weighted to the overall Awair Score and if certain factors had a larger impact on average.

METHODOLOGY

Webcor collected data over the course of eight weeks, using three Awair Omni IAQ monitors covering four separate activities at the 830 Eddy Jobsite, overlaid with jobsite task and safety logs (noting construction activities performed each day and information on particular environmental conditions).



Casework Install includes installing kitchen cabinets and bathroom vanities in units. The installers use table saws, drills, and occasionally glues that contain chemicals that could affect the air monitors. The activity is performed in enclosed units where windows can be opened and closed.



Doors and casing install includes installing frames, doors, and baseboard in units. Installers use table saws, drills, and nail guns. The installers use glue or Bondo wood filler on occasion. These activities are installed in units with ventilation but sometimes in the basement when prepping material. The basement had little ventilation compared to the individual units.

RESULTS

In collaboration with the Awair team, Webcor was able to review the IAQ data, Awair Scores, and jobsite metadata to dig into activities that could use some improvement. These strategies ranged from opening windows for better ventilation (lowering CO2 and TVOCs) to portable air purifiers (for filtering out PM2.5 and TVOCs). The indoor air quality (IAQ) readings were from March 2021-June 2021.

- An analysis of the data showed that Casework Installation activities had consistently high peaks and averages of PM2.5, frequenting in the 90-170 $\mu\text{g}/\text{m}^3$ range. For reference, this range spans the Unhealthy categories on the US AQI color-coded charts, and exceeds the WHO, Federal, and California recommended 24-hour limits.¹
- Mock Up Room activities in a fully enclosed room (with optional window opening to the outdoors) exceeded these levels on at least 40% of monitored days with daily averages of 35 $\mu\text{g}/\text{m}^3$ or more.
- Doors/Wood Trim Install activities, which were conducted in a fully enclosed space with no option for outdoor ventilation, saw some of the highest peaks in Total Volatile Organic Compounds (TVOCs) at more than 8,000 and 12,000 ppb on separate days. The average of all days indicated a higher median and average than almost all other construction activities.

¹ <https://ww2.arb.ca.gov/resources/inhalable-particulate-matter-and-health>

RESULTS (CONTINUED)

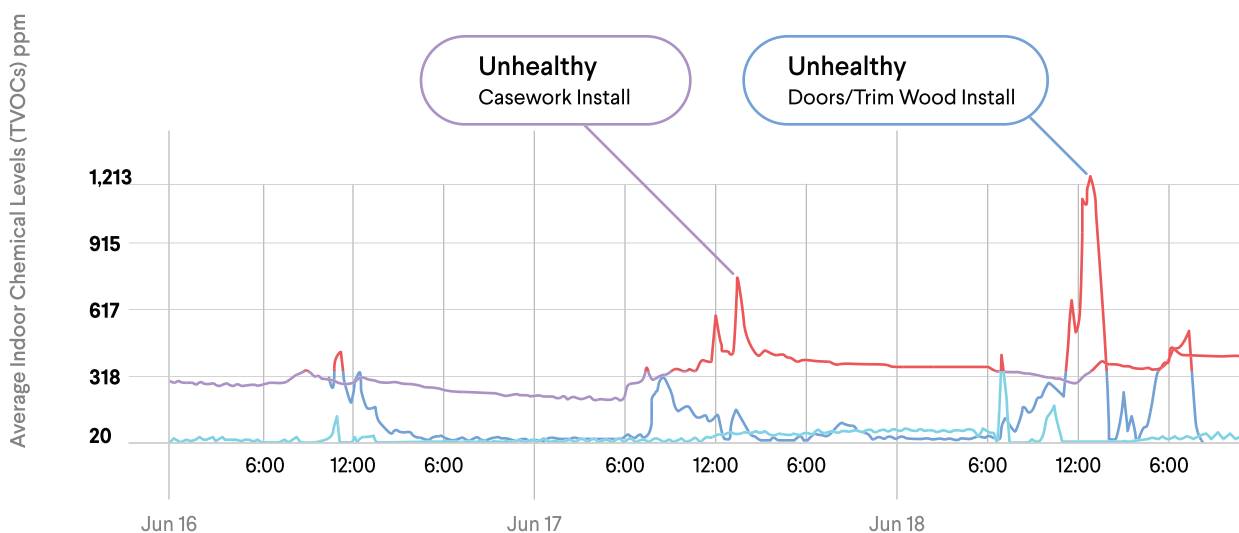
- Drywall Cutting, Hanging, and Taping activities had the smallest sample size of data, but the average of the TVOCs were 450% higher than the next highest activity (see “All Activities-TVOCs”). In addition to the TVOCs, another indicator of poor ventilation are elevated CO₂ levels.

VISUALIZING TVOCs

Indoor air quality was noticeably impacted by various activities performed throughout the project.

Omni Measures
7 Environmental Factors

Temperature Humidity CO₂ Chemicals PM2.5 Light Noise



- Mock-up Room
- Room 2
- Room 1
- Unhealthy Air Quality (>350 ppb)



FUTURE RESEARCH

In addition to COVID-19 risk mitigations, many of the same mitigation strategies can help prevent continuous low level exposures to various harmful compounds. For example, filtration, ventilation, and masking are key activities that can go a long way to reducing buildup of and exposure to harmful compounds in indoor spaces. Even though this study took place at one jobsite over the course of a few months, the workers at Webcor perform similar work all year long. As such, many short, yet on-going exposures to elevated levels of TVOCs and PM2.5, can impact their long-term health. Exposure to elevated PM2.5 has been shown to exacerbate medical conditions such as COPD and heart disease, as well as lead to heart attacks.²

Further inquiries should be made to understand context around the results. Capturing data in real-time can be challenging in construction sites, but with a continuous stream of data, Awair Dashboard features (such as Alerts and reporting) can lead to quicker actions for indoor air quality improvements.

AWAIR + WEBCOR CASE STUDY

“

Awair was a great partner in helping us conduct the case study and provide an analysis of this preliminary effort to understand how our construction activities affect our workers.”

-Maggie Torpey-Murray,
Project Engineering, Sustainability Department

Awair is exploring how certain activities relate to the individual air quality factors. Webcor was interested in tracking their mockup room, casework install, doors/trim install, and drywall cutting to see how those activities impacted IAQ. Overlaying multiple data streams, including detailed labeling, will allow the team to better understand and categorize their activities and the mitigations.

² https://www.cdc.gov/air/particulate_matter.html

Create a healthier, safer workspace with Awair Omni.

We'd love to learn about your project goals and discuss how we can help you reach them. [Reach out to us](#) to start a conversation.

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