Indoor Air Quality Report

Corgi Labs

CORGI LABS

Location: **The Innovation Centre of Barkshire** Analyzed Period: **December 24, 2025 – January 22, 2026** Analyzed Hours: **7:00 - 19:00**

Indoor Air Quality: Unhealthy

Average IAQI: 1.2

Exposure Rates: IAQ

Sorted by the average value, highest to lowest

Exposure to PM2.5

Personal Bark-space	Jan 12 - Jan 22	83 μg/m³	100%
Grooming Station	Dec 24 - Jan 22	75 μg/m³	100%
Hunter's Den	Dec 24 - Jan 22	62 μg/m³	98%
"Off-Leash" Cafeteria	Jan 12 - Jan 22	53 μg/m³	12%, 85%

Exposure to CO_2

"Off-Leash" Cafeteria	Jan 12 - Jan 22	1146 ppm	15%, 64%, 21%
Personal Bark-space	Jan 12 - Jan 22	900 ppm	43%, 48%, 9%
Hunter's Den	Dec 24 - Jan 22	837 ppm	51%, 44%
Grooming Station	Dec 24 - Jan 22	784 ppm	62%, 34%

Exposure to TVOC

Personal Bark-space	Jan 12 - Jan 22	128 ppb	89%, 8%
Grooming Station	Dec 24 - Jan 22	121 ppb	90%
Hunter's Den	Dec 24 - Jan 22	109 ppb	91%
"Off-Leash" Cafeteria	Jan 12 - Jan 22	106 ppb	92%

Exposure Rates: Climate

Sorted by the average value, highest to lowest

Exposure to Temperature

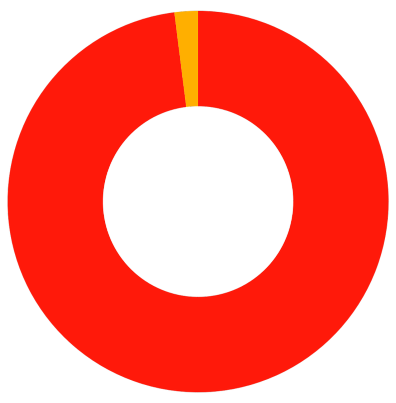
"Off-Leash" Cafeteria	Jan 12 - Jan 22	24.3°C	100%
Hunter's Den	Dec 24 - Jan 22	24.3°C	98%
Grooming Station	Dec 24 - Jan 22	24.2°C	95%
Personal Bark-space	Jan 12 - Jan 22	24.2°C	100%

Exposure to Relative Humidity

"Off-Leash" Cafeteria	Jan 12 - Jan 22	51.9%	100%
Grooming Station	Dec 24 - Jan 22	49.8%	100%
Personal Bark-space	Jan 12 - Jan 22	49.5%	100%
Hunter's Den	Dec 24 - Jan 22	47.4%	100%

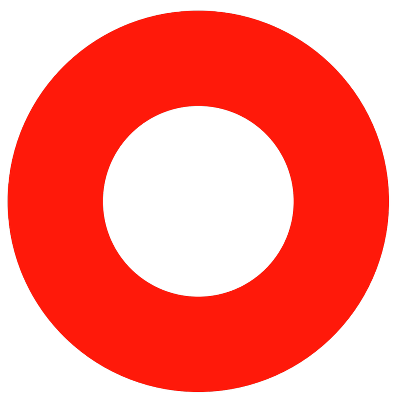
Air Quality Index: Overview

Hunter's Den
Dec 24 - Jan 22 1.3 points



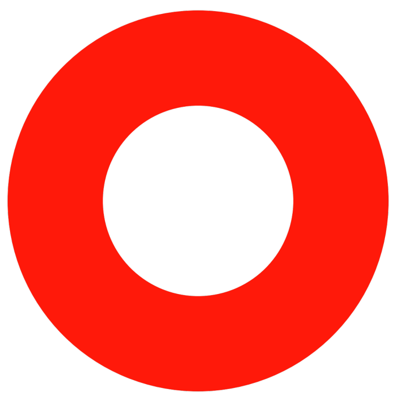
• 0%
• 2%
• 98%

Grooming Station
Dec 24 - Jan 22 0.9 points



• 0%
• 0%
• 100%

Personal Bark-space
Jan 12 - Jan 22 0.8 points



• 0%
• 0%
• 100%

"Off-Leash" Cafeteria
Jan 12 - Jan 22 1.7 points

• 0%
• 13%
• 87%

Air Quality Classification

	Good	Moderate	Unhealthy
IAQI	above 8 points	from 8 to 4 points	below 4 points
PM2.5	below 10 μg/m³	from 10 to 25 μg/m³	above 25 μg/m³
CO_2	below 800 ppm	from 800 to 1400 ppm	above 1400 ppm
TVOC	below 215 ppm	from 215 to 343 ppm	above 343 ppm
Temperature	from 20 to 26 °C	from 18 to 20 °C and from 26 to 28 °C	below 18 °C and above 28 °C
Relative Humidity	from 40 to 60 %	from 25 to 40 % and from 60 to 75 %	below 25 % and above 75 %

Report Info

This report is based on two datasets with different temporal coverage.

- The first dataset starts on **December 24, 2025** and corresponds to monitoring devices installed in the **Hunter's Den** and the **Grooming Station**.
- The second dataset starts on **January 12, 2026**, following the installation of additional devices in the **Personal Bark-space** and the **"Off-Leash" Cafeteria**.

For metric definitions and visualization descriptions, refer to the last page of this report.

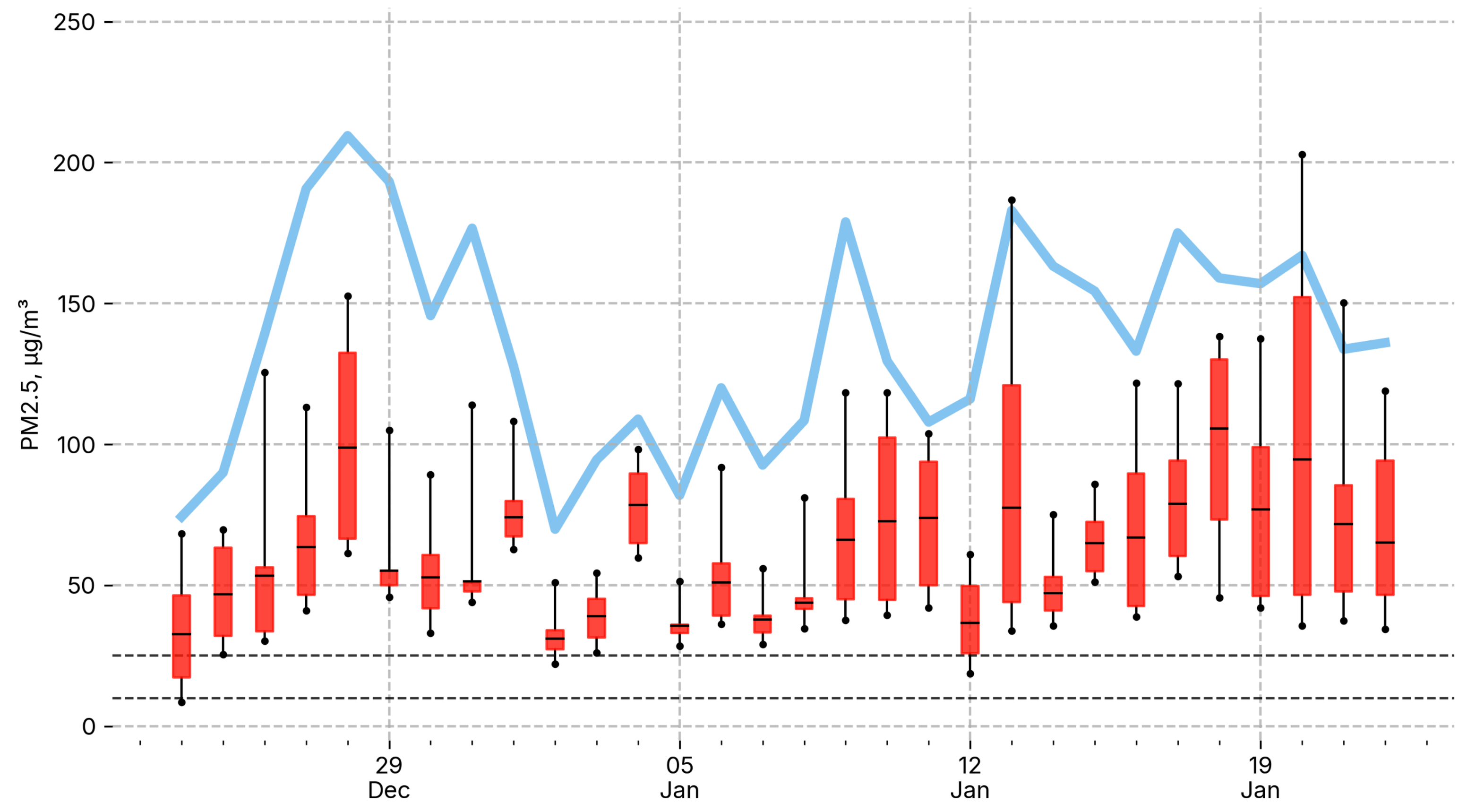
Air Quality Dynamics

Good · Moderate · Unhealthy · Outdoor reference

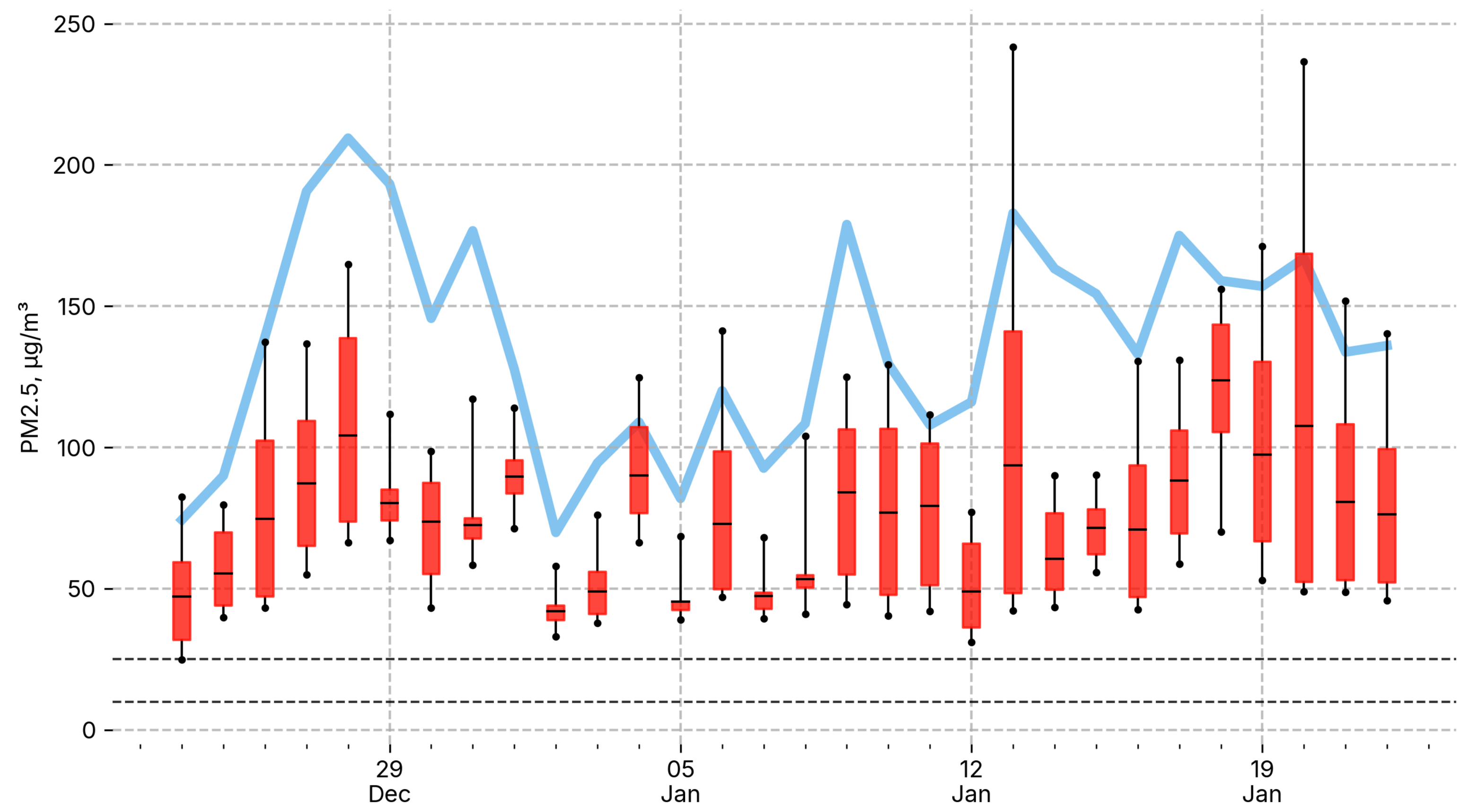
PM2.5 Dynamics by Location

Day-to-Day Dynamics

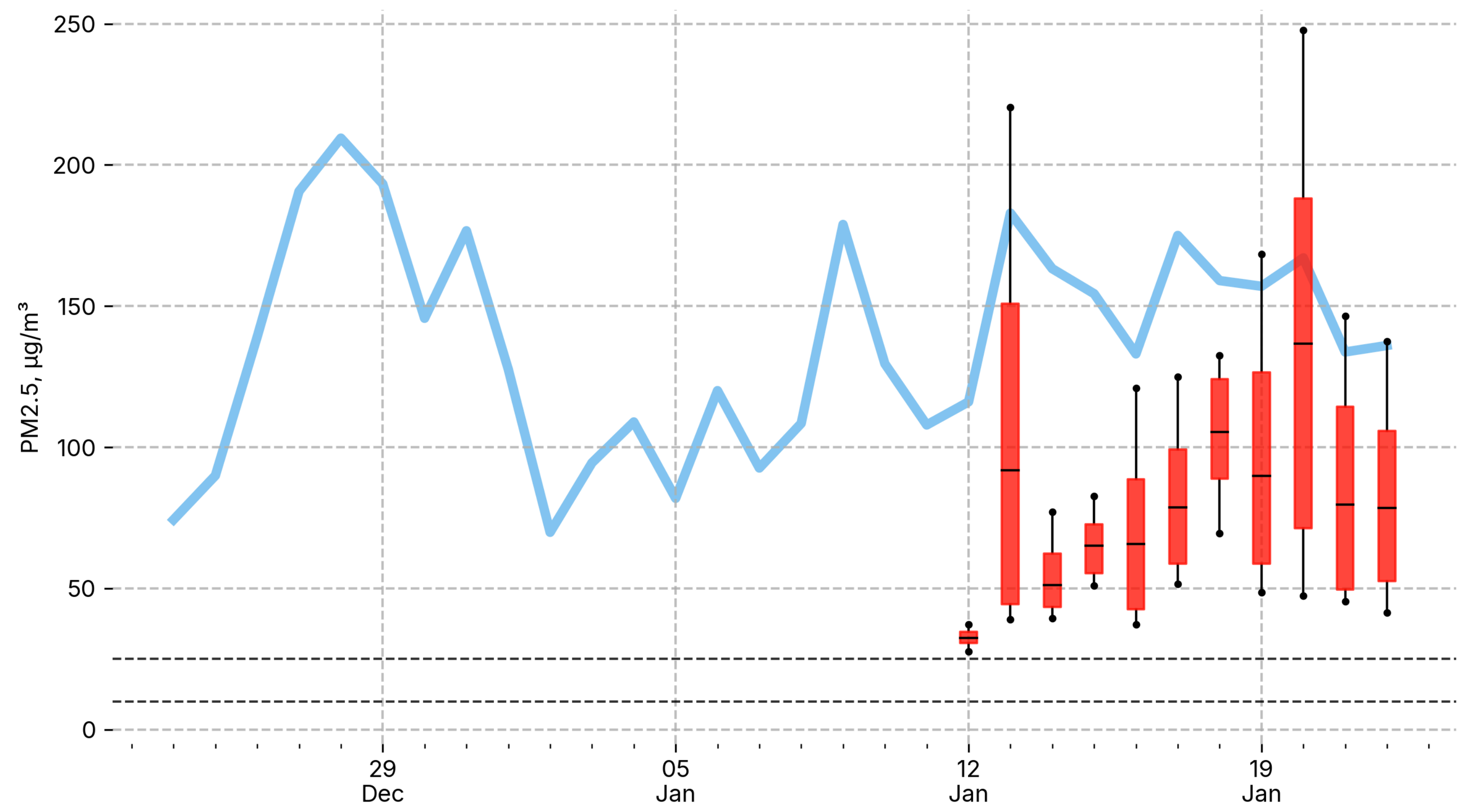
Hunter's Den Dec 24 - Jan 22



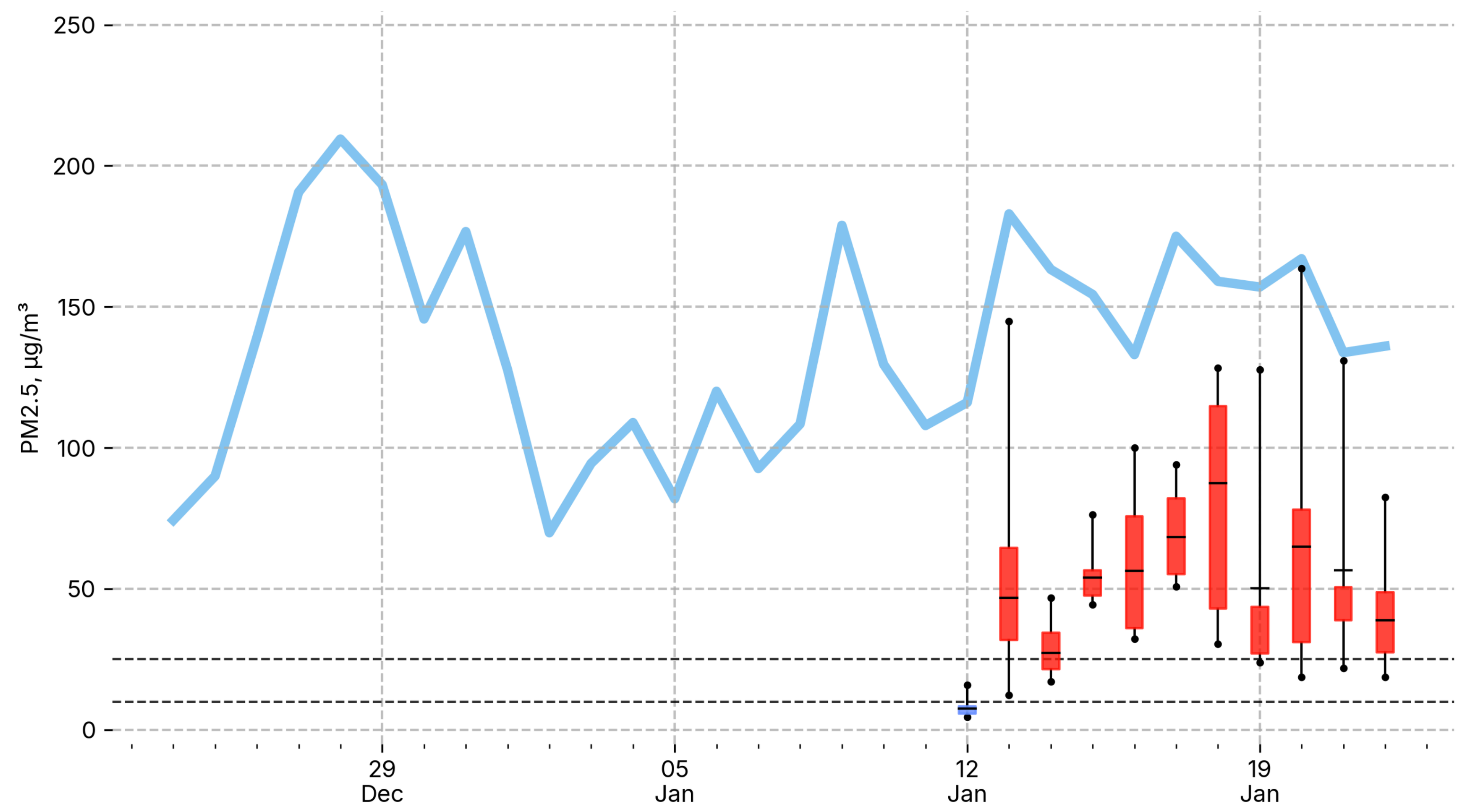
Grooming Station Dec 24 - Jan 22



Personal Bark-space Jan 12 - Jan 22



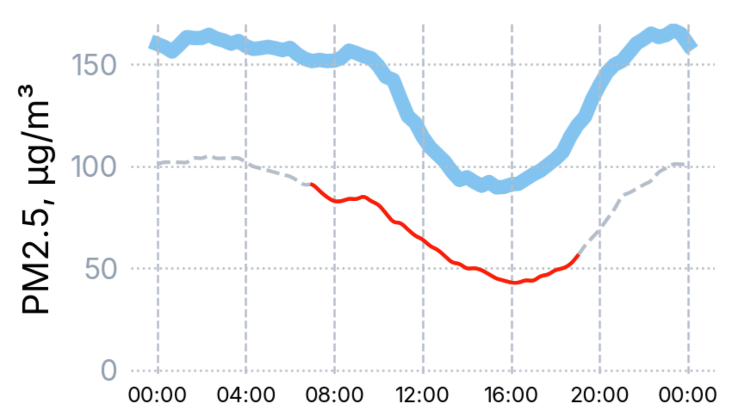
"Off-Leash" Cafeteria Jan 12 - Jan 22



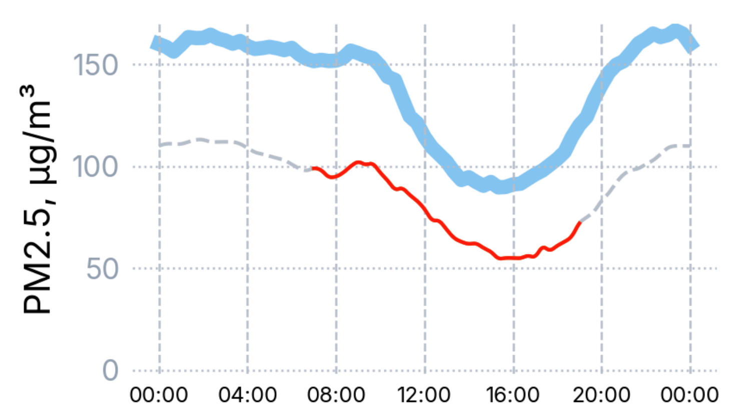
PM2.5 Daily Cycle by Location

Daily Cycles

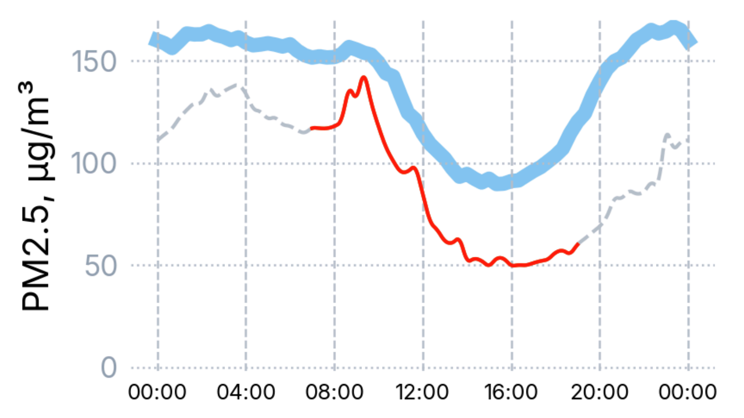
Hunter's Den Dec 24 - Jan 22



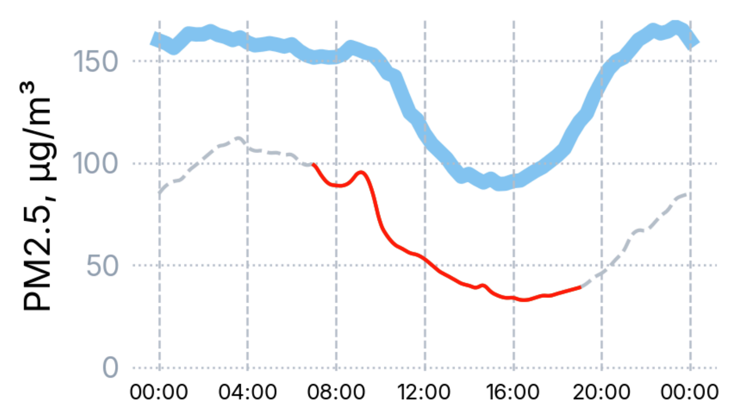
Grooming Station Dec 24 - Jan 22



Personal Bark-space Jan 12 - Jan 22



"Off-Leash" Cafeteria Jan 12 - Jan 22



Exposure to elevated levels of PM2.5 can have long-lasting health effects, including diseases of the heart and respiratory system [1].

According GO AQS [2], a recommended PM2.5 level is below 10 µg/m³; air with a PM2.5 concentration above 25 µg/m³ is considered unhealthy.

Commentary

During the analyzed period, PM2.5 concentrations frequently reached **Moderate** to **Unhealthy** levels.

As observed in both the **Day-to-Day Dynamics** and **Daily Cycle** plots, indoor PM2.5 concentrations were consistently lower than outdoor values; however, the indoor trend closely followed the ambient pattern. This strong coherence indicates that indoor PM2.5 is significantly influenced by outdoor particulate matter, making indoor air quality vulnerable to external pollution episodes. Among the monitored locations, the **Personal Bark-space** appears more sensitive to higher outdoor PM2.5 concentrations than the other rooms.

All rooms showed similar PM2.5 dynamics, although the **"Off-Leash" Cafeteria** exhibited a lower baseline than the other locations. Two plausible explanations are: (1) the **"Off-Leash" Cafeteria** receives less outdoor air (reducing pollutant ingress), and/or (2) filtration effectiveness for supplied air is higher in that zone compared to other areas.

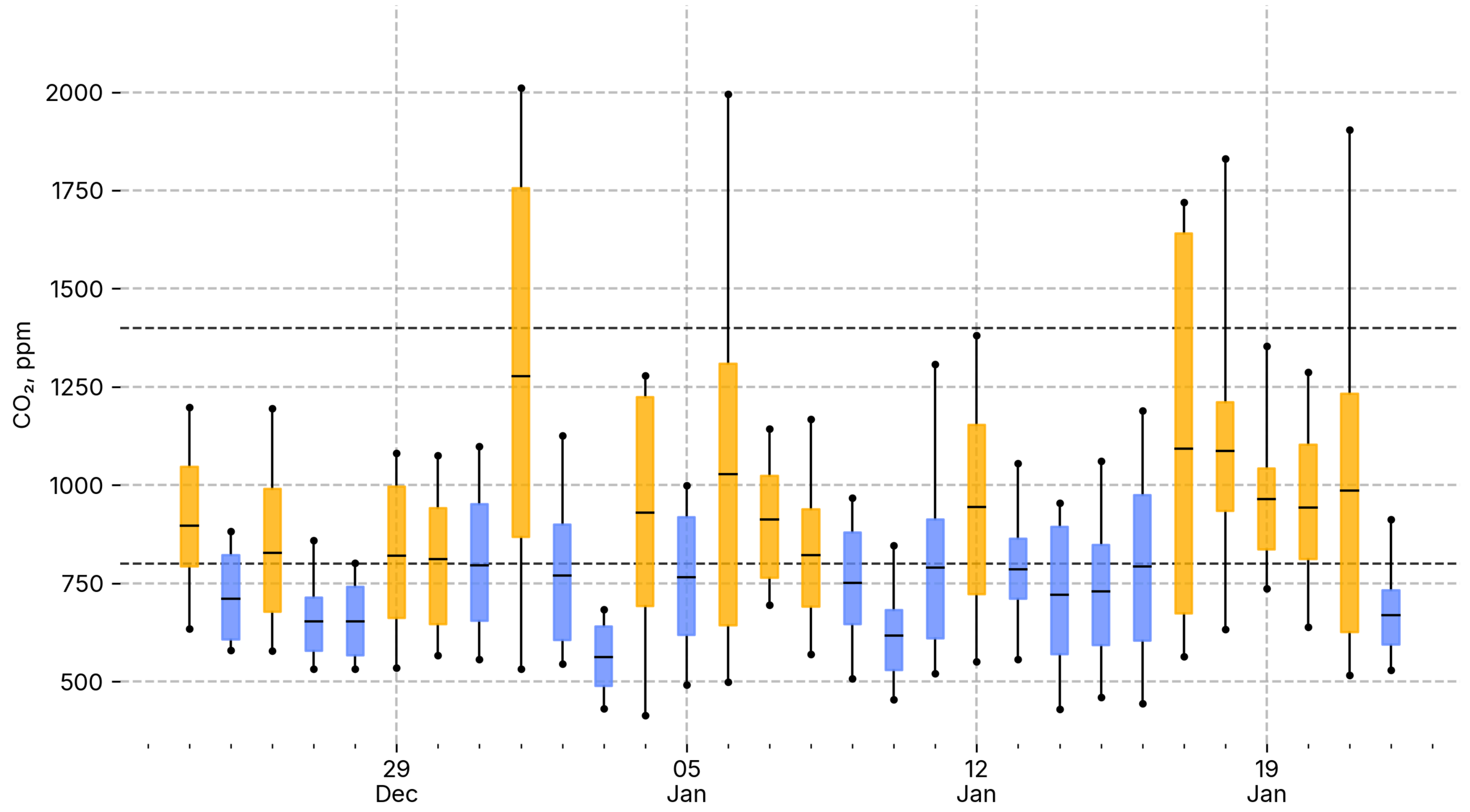
Air Quality Dynamics

Good · Moderate · Unhealthy · Outdoor reference

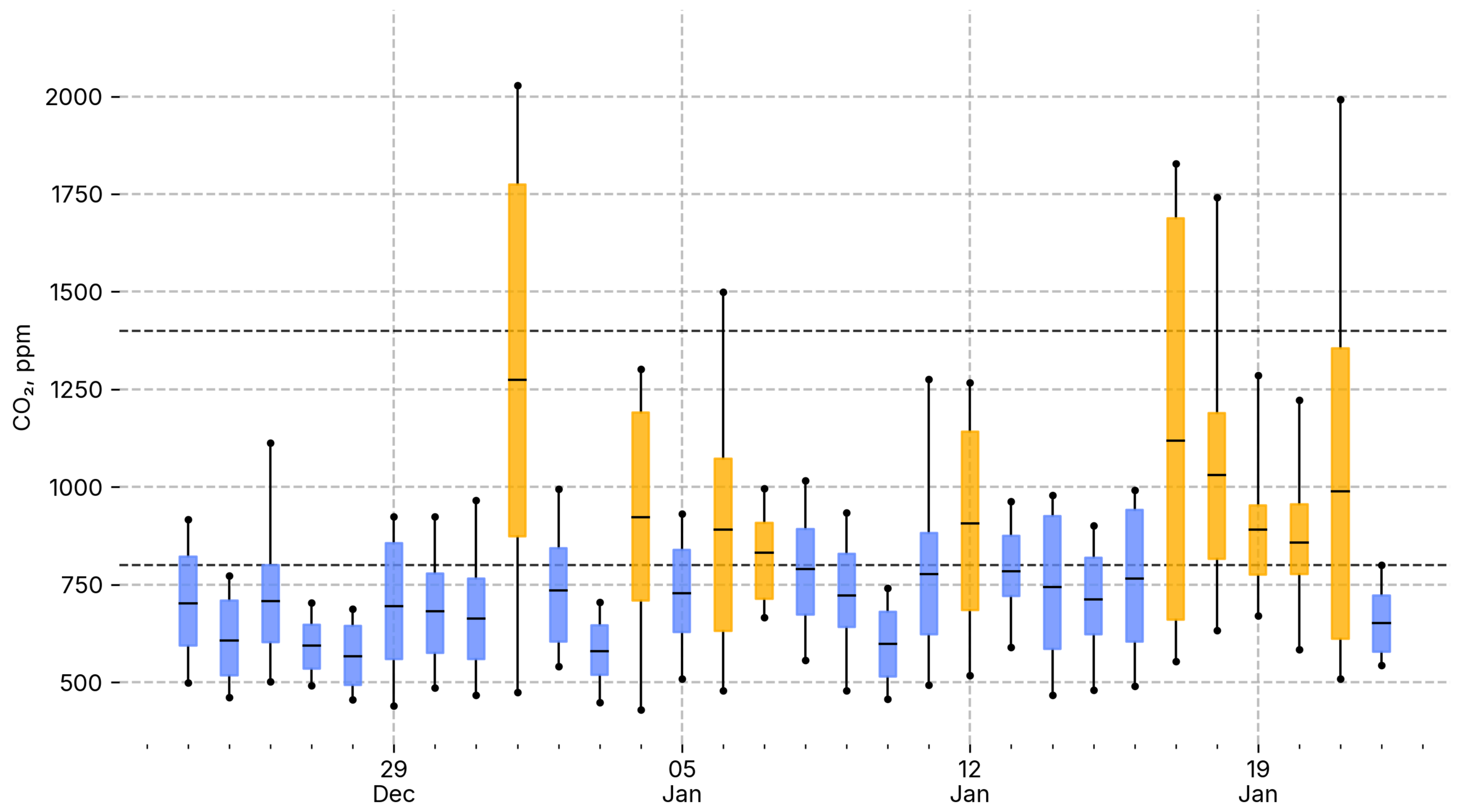
CO_2 Dynamics by Location

Day-to-Day Dynamics

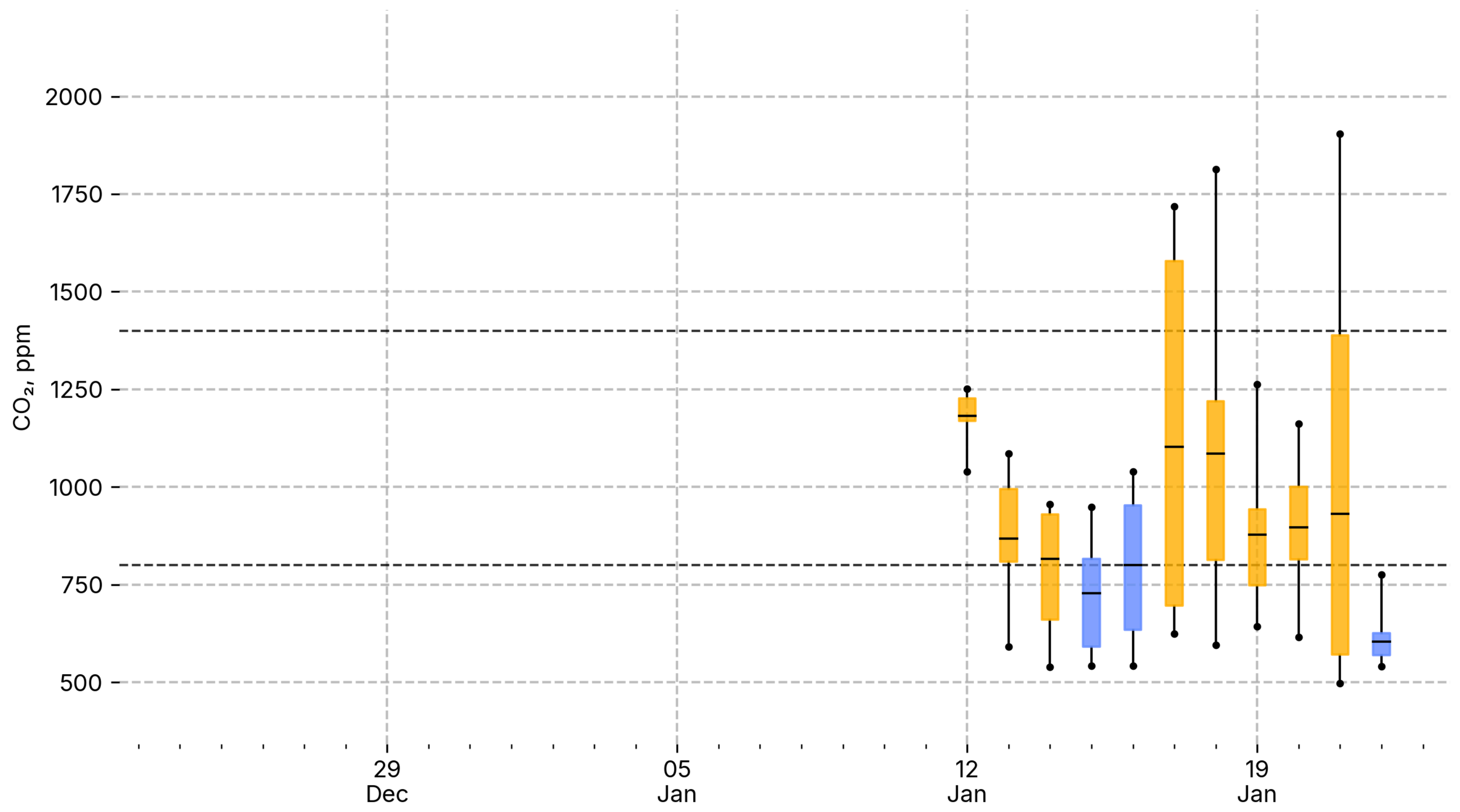
Hunter's Den Dec 24 - Jan 22



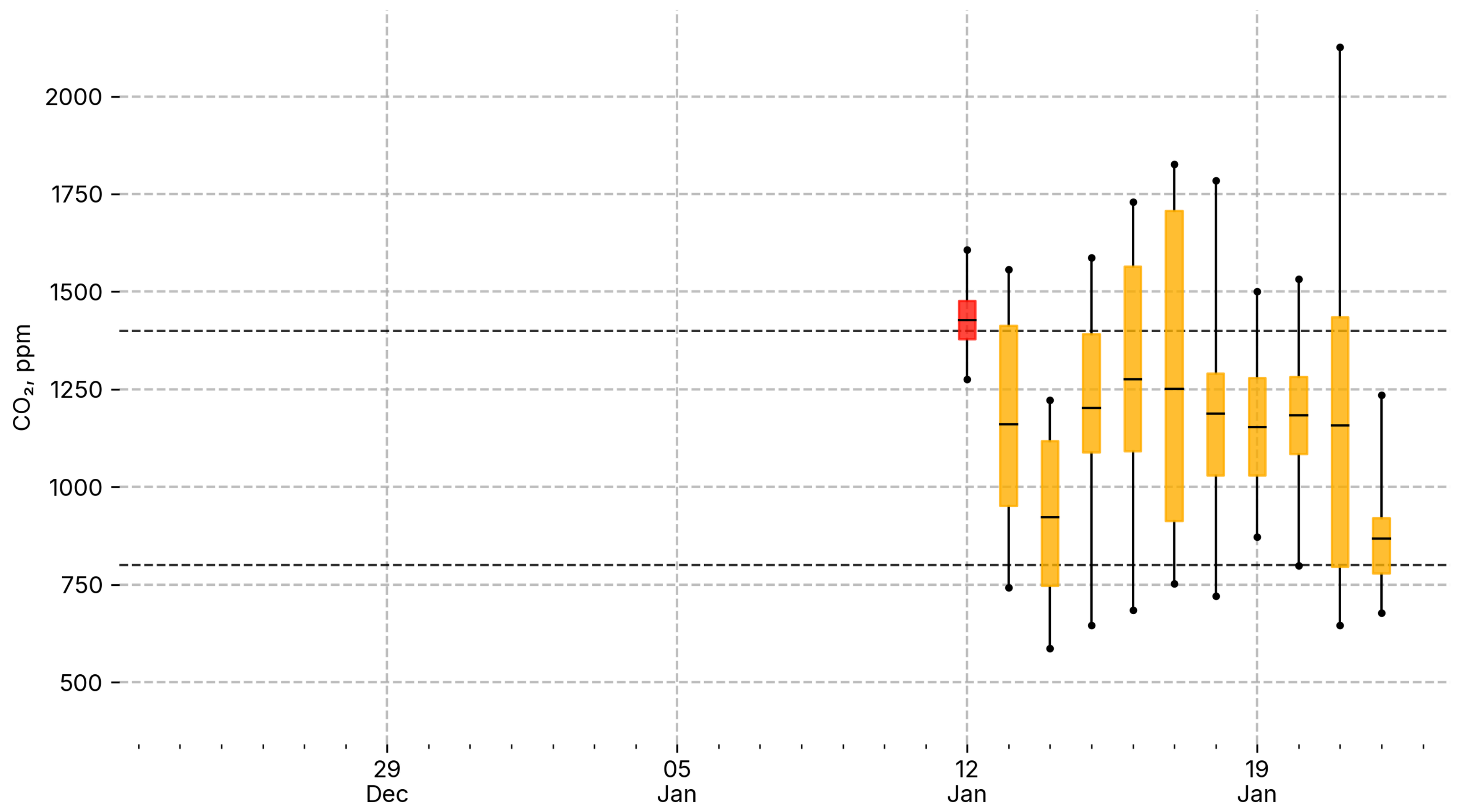
Grooming Station Dec 24 - Jan 22



Personal Bark-space Jan 12 - Jan 22



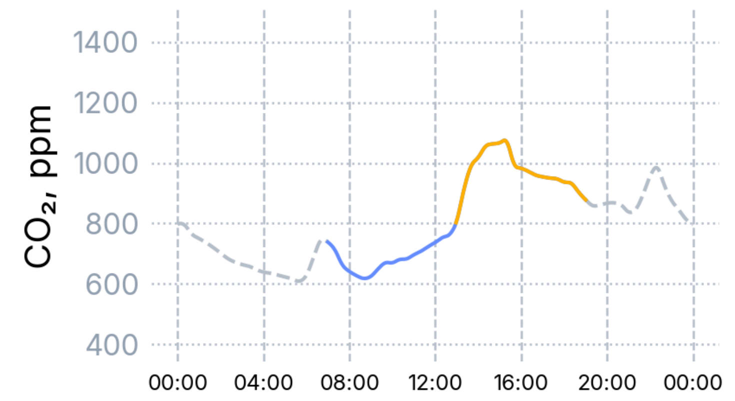
"Off-Leash" Cafeteria Jan 12 - Jan 22



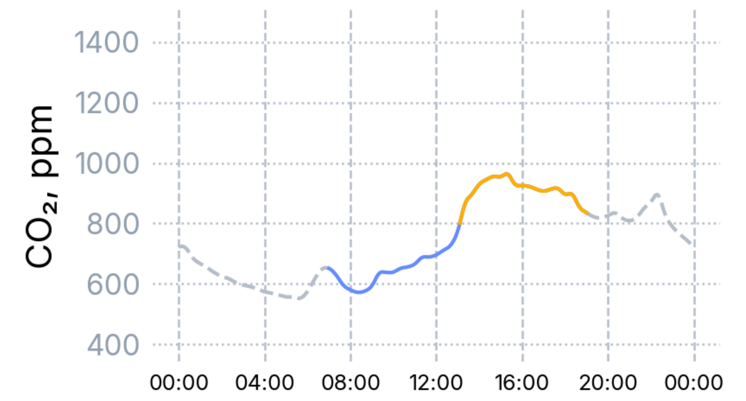
CO_2 Daily Cycle by Location

Daily Cycles

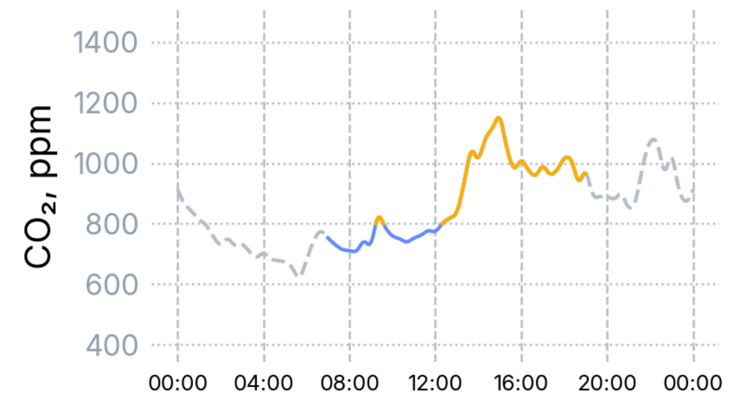
Hunter's Den Dec 24 - Jan 22



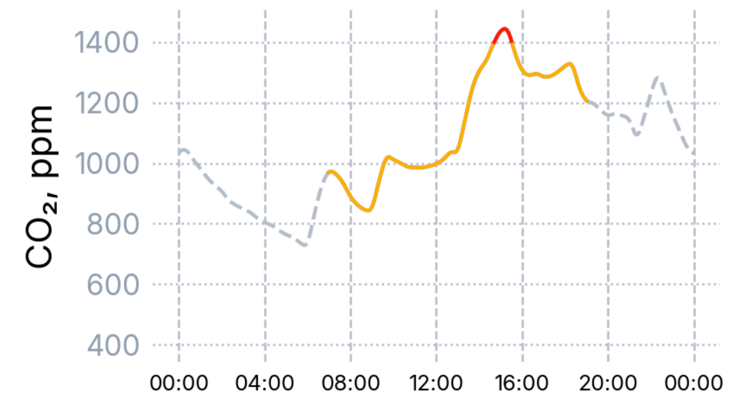
Grooming Station Dec 24 - Jan 22



Personal Bark-space Jan 12 - Jan 22



"Off-Leash" Cafeteria Jan 12 - Jan 22



Exposure to elevated levels of CO_2 can have short-term negative effects on cognitive abilities and work performance [3, 4].

According to GO AQS [2], maintaining indoor CO_2 levels below 800 ppm indicates effective ventilation. Concentration above 1400 ppm may signify inadequate ventilation that may cause internally generated pollutants to buildup.

Commentary

Overall, CO_2 concentrations remained below the **Unhealthy** level for most of the monitoring period.

Days when CO_2 concentrations exceeded the **Moderate** threshold are most likely attributable to increased occupancy combined with insufficient outdoor air supply. During these periods, the ventilation rate was not adequate to offset the rate of CO_2 accumulation.

As with PM2.5, CO_2 dynamics were broadly similar across rooms. In contrast to PM2.5, however, the **"Off-Leash" Cafeteria** showed a higher CO_2 baseline. This supports the conclusion that outdoor air supply in the **"Off-Leash" Cafeteria** is insufficient relative to its occupancy patterns.

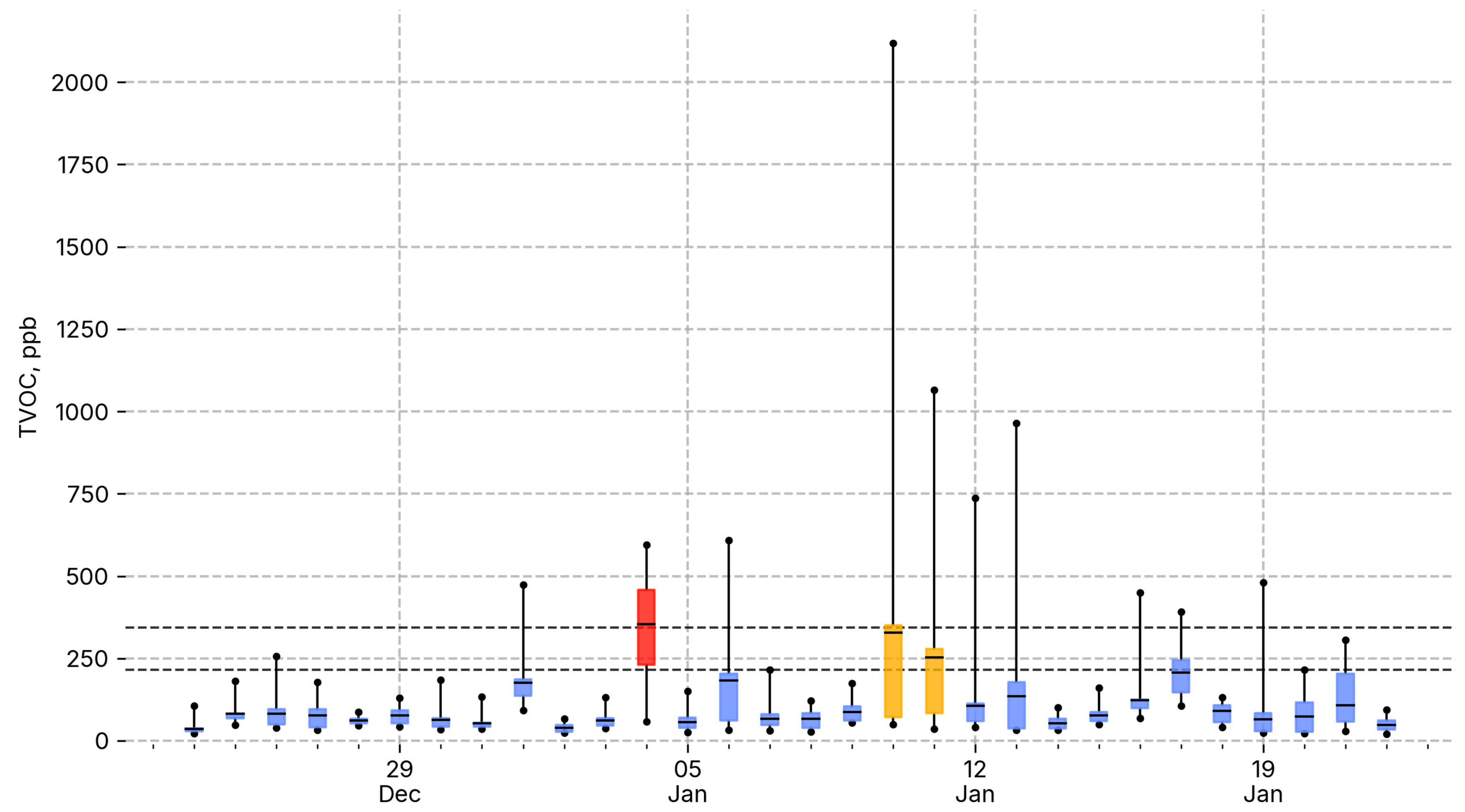
Air Quality Dynamics

● Good ● Moderate ● Unhealthy ● Outdoor reference

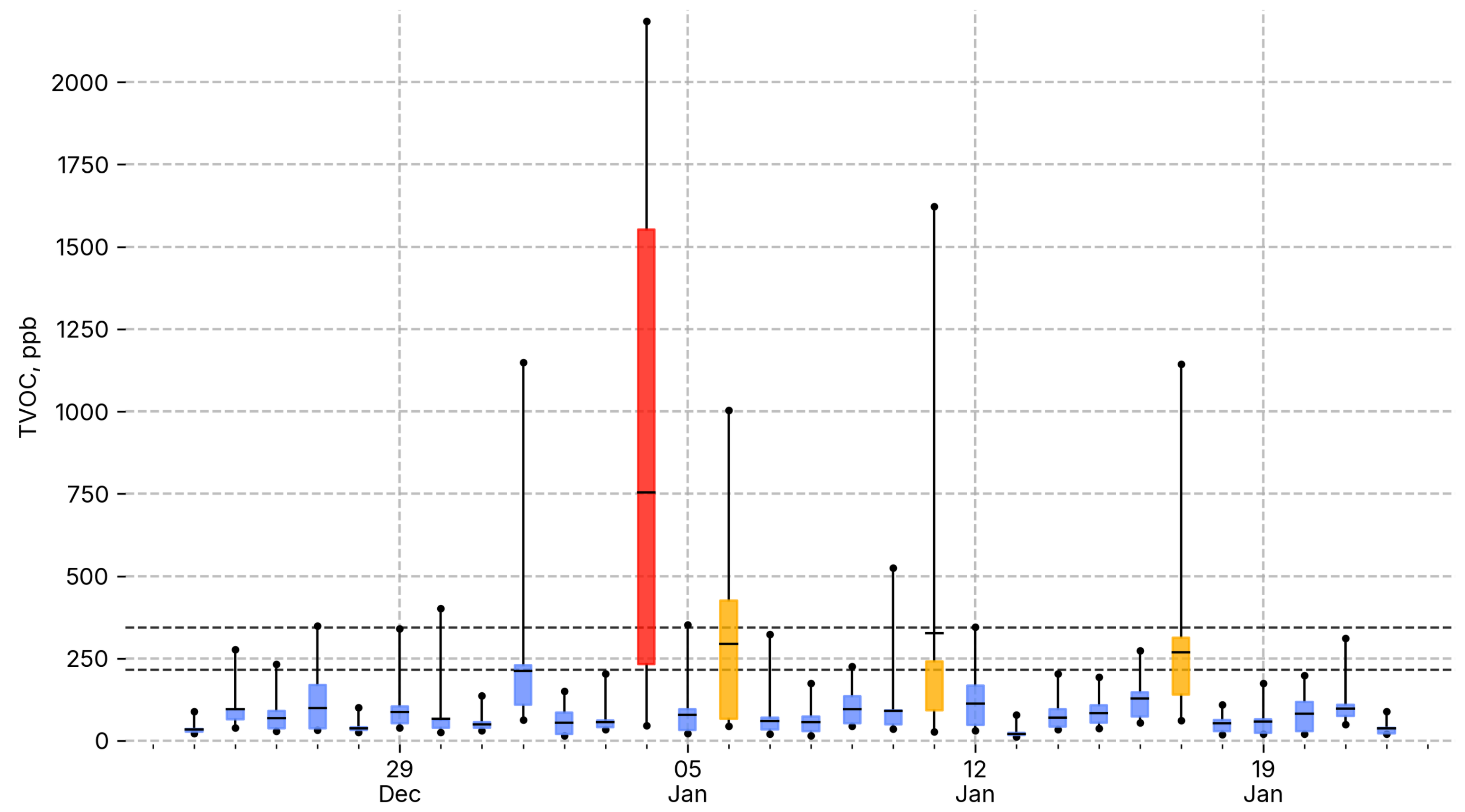
TVOC Dynamics by Location

Day-to-Day Dynamics

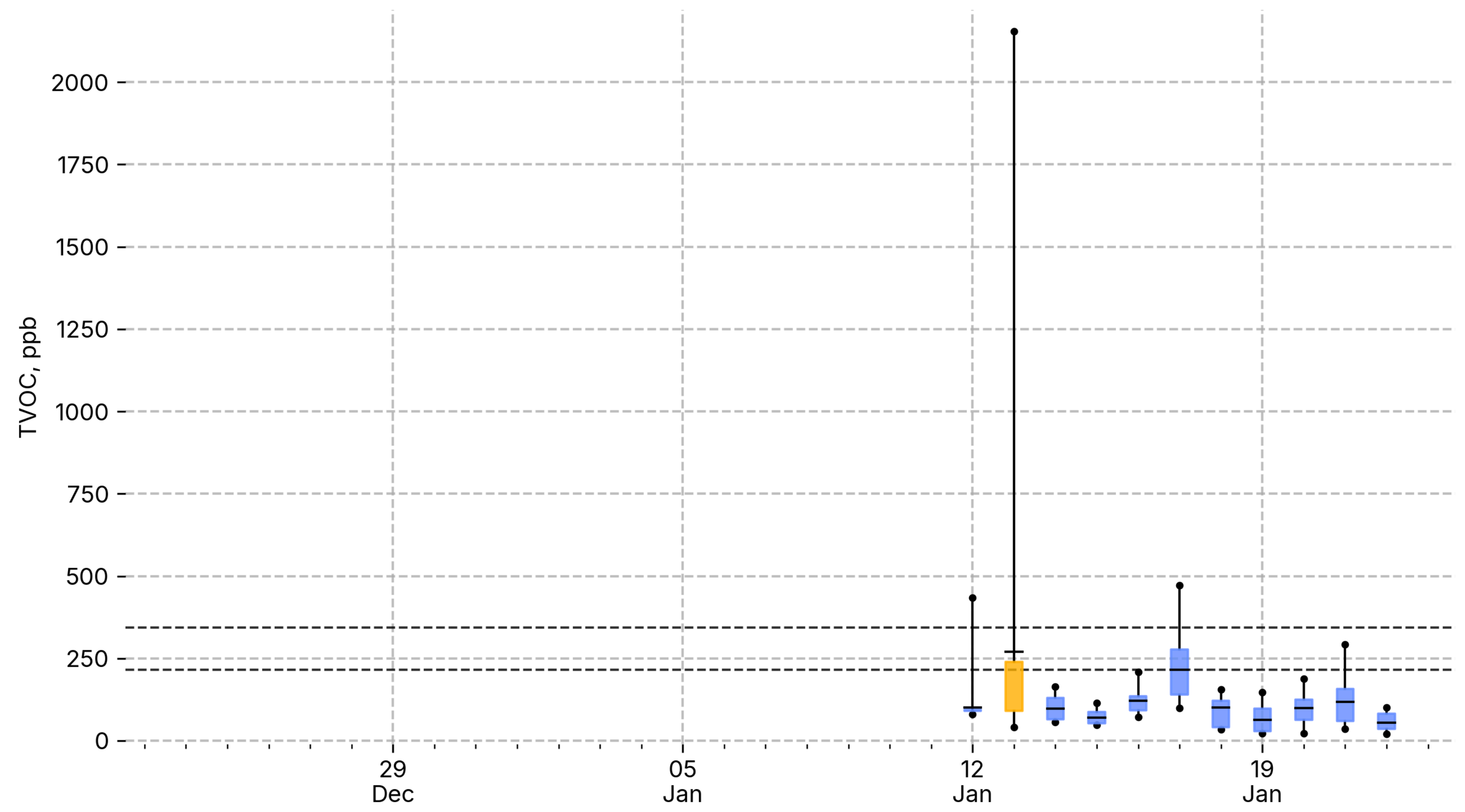
Hunter's Den Dec 24 - Jan 22



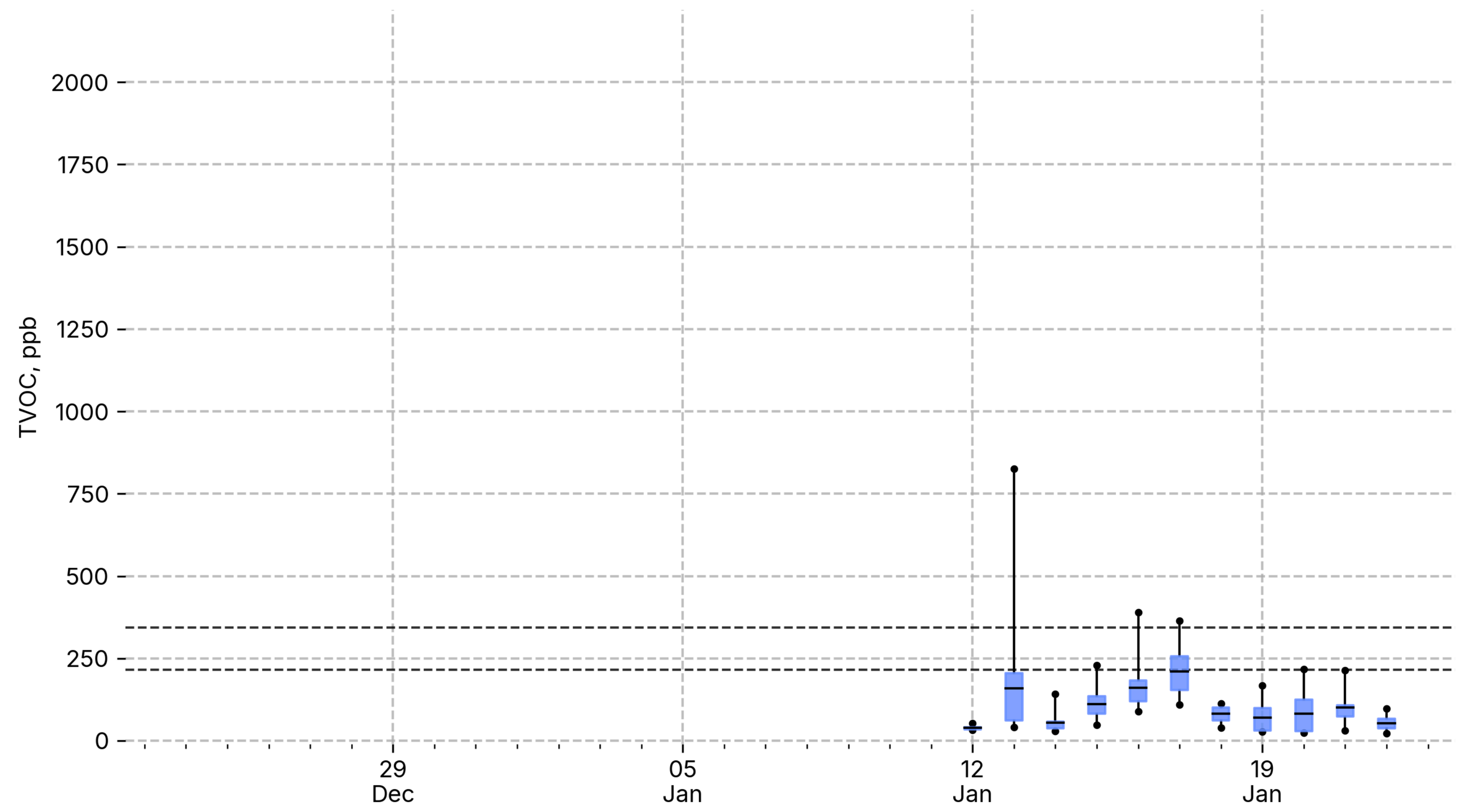
Grooming Station Dec 24 - Jan 22



Personal Bark-space Jan 12 - Jan 22



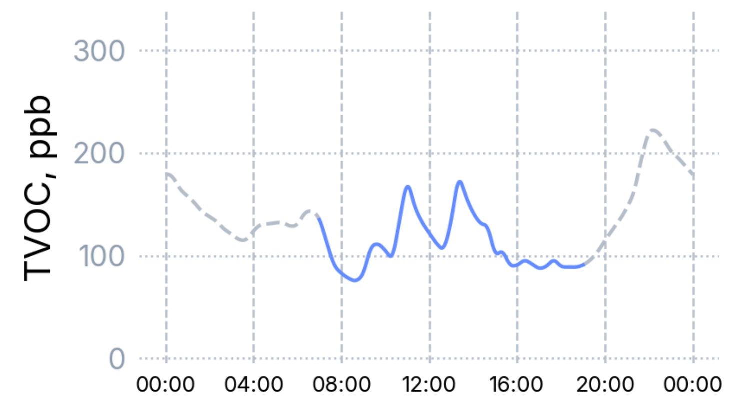
"Off-Leash" Cafeteria Jan 12 - Jan 22



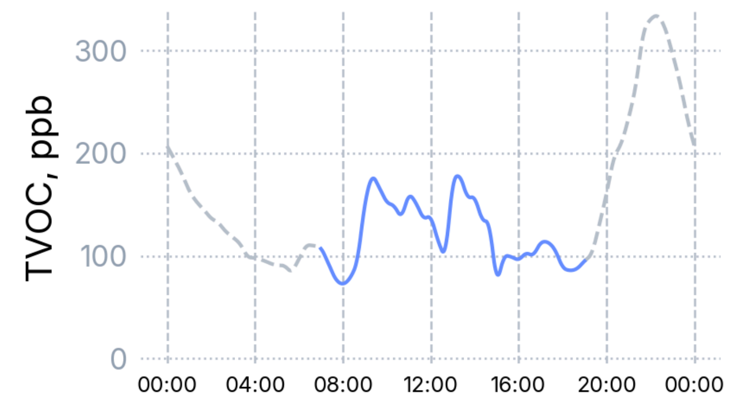
TVOC Daily Cycle by Location

Daily Cycles

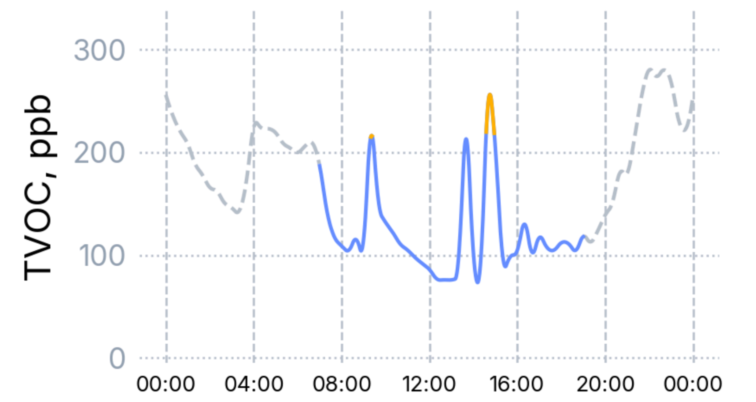
Hunter's Den Dec 24 - Jan 22



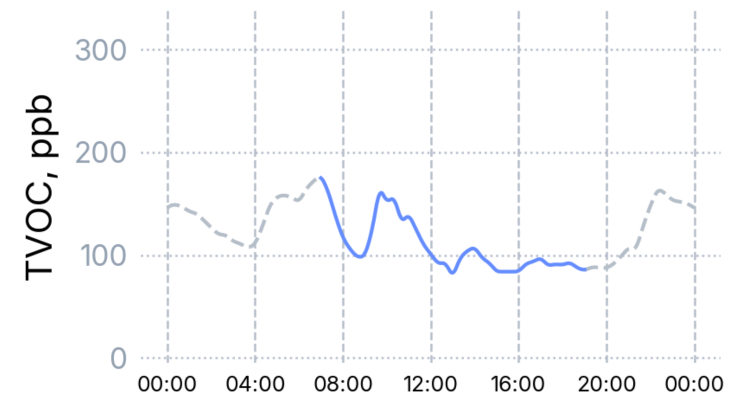
Grooming Station Dec 24 - Jan 22



Personal Bark-space Jan 12 - Jan 22



"Off-Leash" Cafeteria Jan 12 - Jan 22



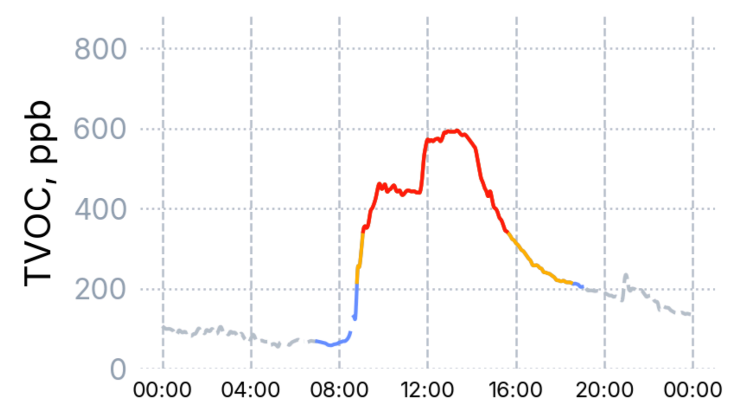
Exposure to elevated levels of CO_2 can have short-term negative effects on cognitive abilities and work performance [3, 4].

According to RESET [5], a high-performance CO_2 level is below 600 ppm; an acceptable CO_2 level is below 1000 ppm.

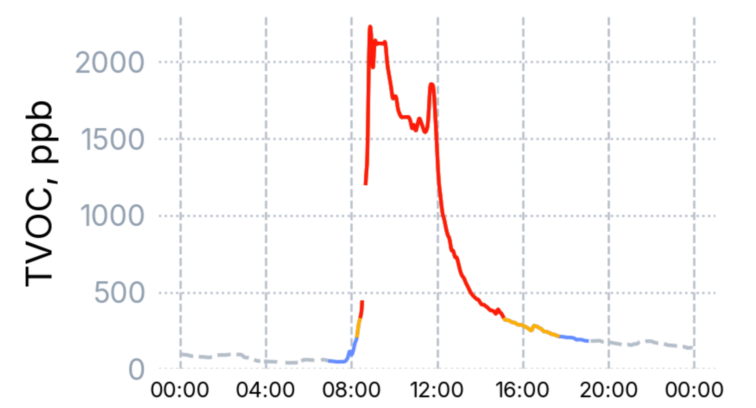
TVOC and PM2.5 on January 4, 2026

Temporal Plots

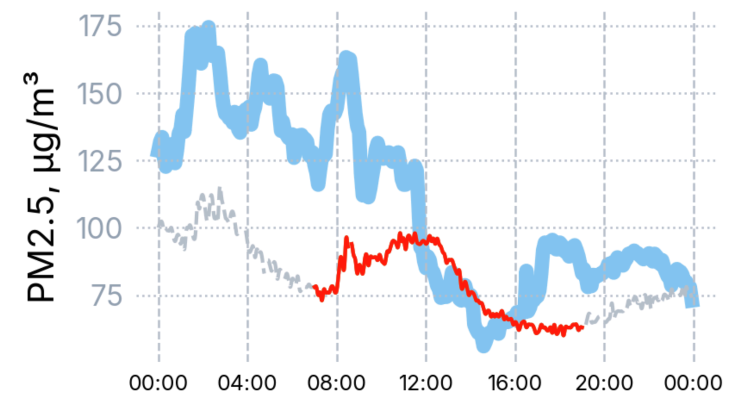
Hunter's Den Jan 4, 2026



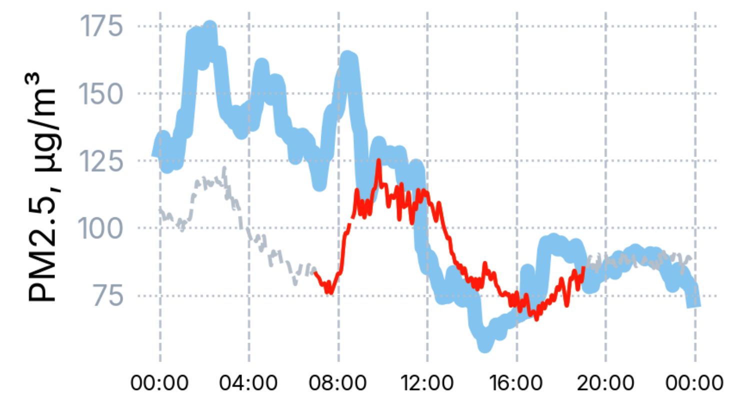
Grooming Station Jan 4, 2026



Hunter's Den Jan 4, 2026



Grooming Station Jan 4, 2026



Commentary

TVOC concentrations remained within the **Good** range for most of the analyzed period. However, a prolonged TVOC elevation was observed on **January 4** in both rooms monitored at that time. Temporal plots illustrating these episodes are provided in the report.

Both rooms experienced sustained high TVOC exposure on **January 4,** with higher concentrations in the **Grooming Station.** The temporal pattern suggests a persistent VOC source; under typical conditions, VOC levels tend to return to baseline relatively quickly once the source is removed or diluted.

A comparison with PM2.5 trends on the same day shows that the TVOC increase coincided with elevated PM2.5, suggesting that the source may have been related to particle-generating activities or processes occurring concurrently.

Additional TVOC exceedance episodes were detected on **January 6, January 10–13, January 17.** Although these episodes were less severe, they should also be investigated, particularly if they recur.

Climate Comfort

● Good ● Moderate ● Unhealthy ● Outdoor reference

Average Temperature Values

Hunter's Den
Dec 24 - Jan 22
24.3 °C
(from 22.4 to 26.5 °C)

Grooming Station
Dec 24 - Jan 22
24.2 °C
(from 22.1 to 26.6 °C)

Personal Bark-sp...
Jan 12 - Jan 22
24.2 °C
(from 22.0 to 25.7 °C)

"Off-Leash" Cafe...
Jan 12 - Jan 22
24.3 °C
(from 22.2 to 25.8 °C)

Standards for thermal comfort [6] suggest keeping indoor temperatures in the range between 20-26 °C. According to WHO, the lowest recommended temperature is 18 °C [7].

Average Relative Humidity Values

Hunter's Den
Dec 24 - Jan 22
47.4 %
(from 40.7 to 56.0 %)

Grooming Station
Dec 24 - Jan 22
49.8 %
(from 42.4 to 57.2 %)

"Off-Leash" Cafe...
Jan 12 - Jan 22
51.9 %
(from 46.3 to 60.2 %)

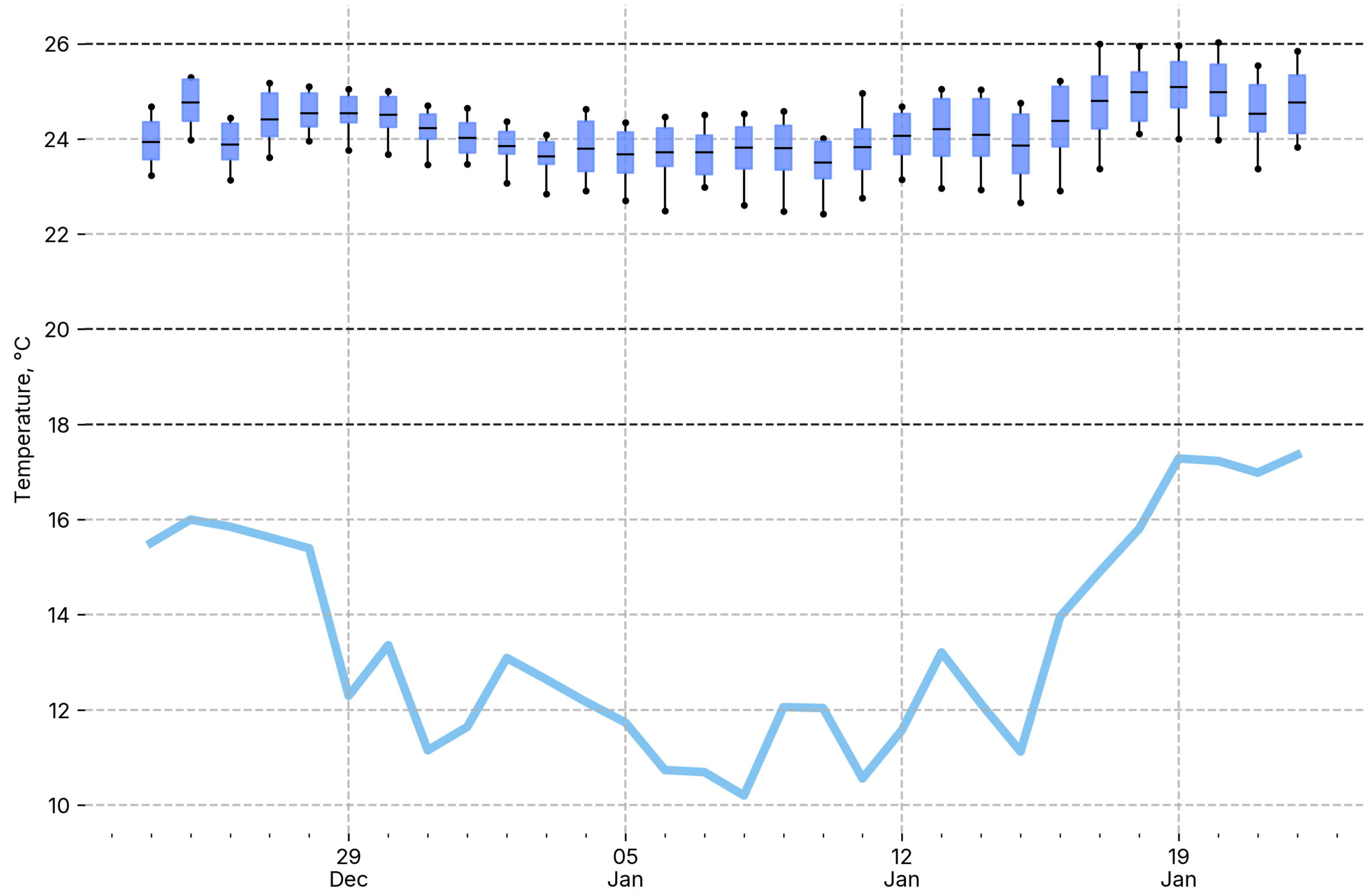
Personal Bark-sp...
Jan 12 - Jan 22
49.5 %
(from 41.4 to 57.6 %)

Elevated humidity levels accelerate mold growth and contribute to the deterioration of building materials [8].

According to WHO guidelines on indoor air quality [8], indoor humidity should be kept below 75% to prevent building material degradation. Various studies [8, 9] suggest that maintaining indoor humidity between 40% and 60% helps mitigate the spread of airborne diseases.

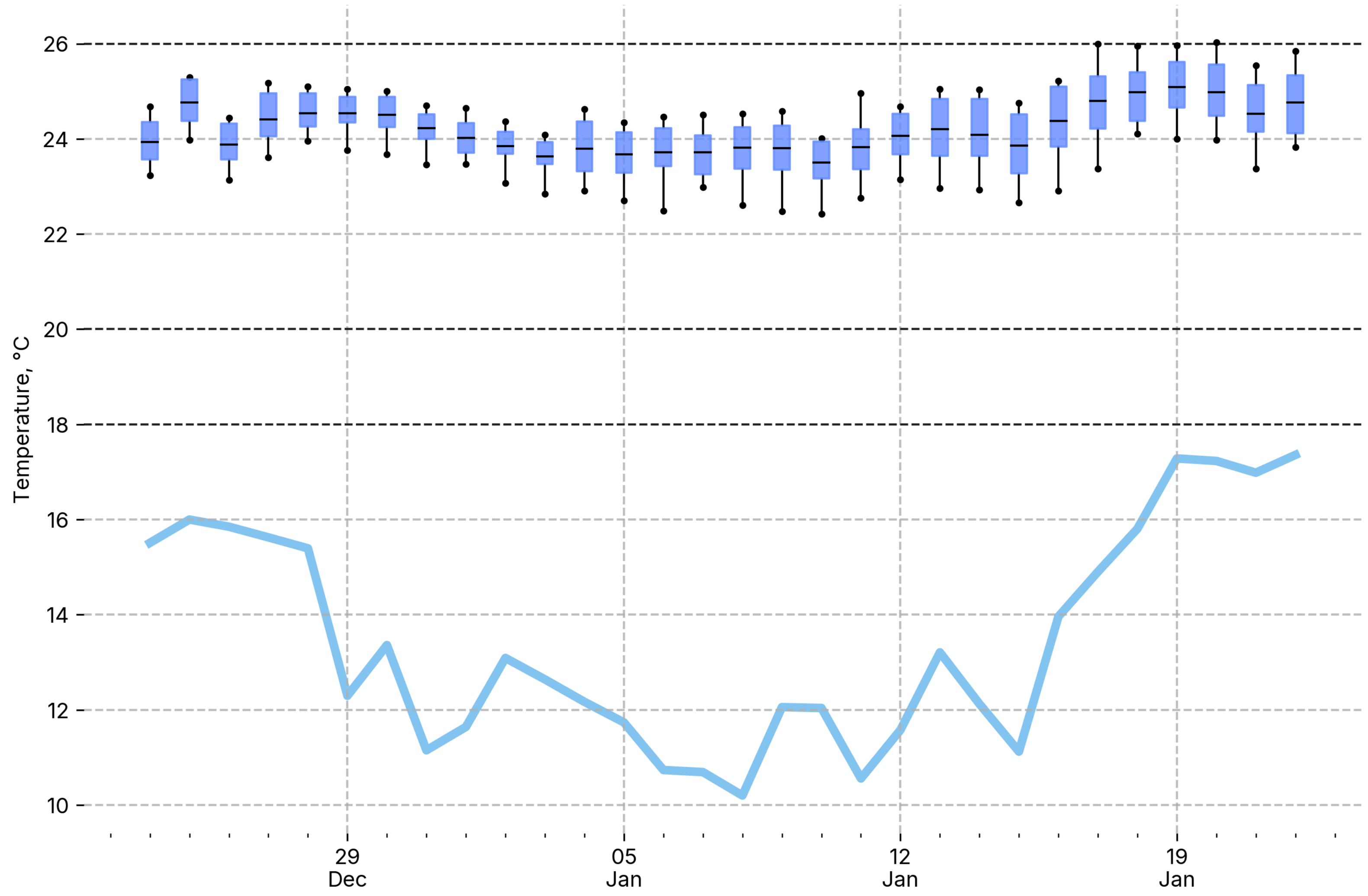
Temperature level is Good

Total Day-to-Day Dynamics



Relative Humidity level is Good

Total Day-to-Day Dynamics



Commentary

Average indoor temperature and relative humidity remained within the **Good** comfort range throughout the monitoring period. The thermal environment across the monitored spaces was stable and showed no significant dependence on outdoor climatic conditions, indicating effective temperature and humidity control.

Conclusions

Overview

Indoor Monitors Distribution. The indoor air quality monitoring network consists of four devices:
Installed on December 23, 2025 (data used from December 24, 2025):

- **Hunter's Den**
- **Grooming Station**

Installed on January 12, 2026:

- **HR cabin**
- **"Off-Leash" Cafeteria**

Overall indoor air quality was classified as **Unhealthy** for most of the monitoring period. PM2.5 was the dominant contributor to lower IAQI values for approximately 99% of the time, while CO_2 was dominant for the remaining 1%.

Metrics and Visual Representation

Indoor Air Quality Index (IAQI). The IAQI is a composite score based on observed PM2.5 and CO_2 concentrations. Its value ranges from 0 to 10, with higher values indicating better air quality. **Average IAQI** provides an overall assessment of indoor air quality and serves as a quick reference for comparing different rooms or time periods.

Air Quality Index: Overview. Charts represent observed IAQI levels during operating hours. Average values are shown for reference.

Exposure Rates. The bar plots show the distribution of recorded measurements across exposure categories for PM2.5, CO_2, and TVOC, as well as temperature and relative humidity. Rooms are ordered from higher to lower average values.

Day-to-Day Dynamics. Each candle represents data collected over a single day during the analyzed period. The candle body shows the interquartile range (Q1–Q3), while the wicks (black lines) mark minimum and maximum values. The black horizontal dashes show daily average values. This visualization highlights patterns and anomalies. *Average outdoor values are included for comparison.*

Total Day-to-Day Dynamics. Each candle represents data collected over a single day during the analyzed period. The candle body shows the interquartile range (Q1–Q3), while the wicks (black lines) mark the 0.1 and 0.9 quantiles—capturing 80% of typical data and minimizing outlier impact. Black horizontal dashes show daily average values. This visualization highlights patterns and anomalies without distortion from extremes. *Average outdoor values are included for comparison.*

Daily Cycle. Each line shows the AQ parameter's hour-by-hour profile for each location, illustrating how the parameter changes over the course of a "typical day". This enables direct comparison of each location's pattern against one another, helping to quickly spot outliers or distinct variations in rooms. *Average outdoor values are included for comparison.*

Temporal Plot. The line represents the evolution of the parameter over the selected time frame. *Average outdoor values are included for comparison.*

Average Values. Displays the average, minimum, and maximum values for each room over the analyzed period. Colors indicate the assigned category based on the average value.

Outdoor Reference Line. The blue line represents the outdoor value of the parameter, depending on visualization.

Recommendations

Improve ventilation performance during occupied hours. Increase outdoor air intake with high performance particulate filters in place during occupied periods, particularly under high occupancy. CO_2 exceedances indicate that current outdoor air rates are insufficient under peak load conditions, especially in the **"Off-Leash" Cafeteria.** Where feasible, implement demand-controlled ventilation (DCV) using CO_2 as a control parameter to modulate filtered outdoor air based on occupancy.

Reduce outdoor PM2.5 ingress via filtration and system integrity. Given the strong outdoor-to-indoor coupling of PM2.5, consider upgrading AHU filtration efficiency to better mitigate outdoor pollution episodes. If filtration is already rated appropriately, inspect and maintain filter sealing and check for bypass/leakage paths to ensure supplied air is fully filtered.

During known outdoor pollution events, consider temporarily reducing outdoor air intake while maintaining minimum ventilation requirements, if system design and operational constraints allow. Complement this with maximized filtration and (if available) recirculation cleaning strategies.

Investigate and manage high-TVOC events. Identify activities, materials, or processes that could drive sustained VOC exposure (e.g., cleaning agents, solvents, adhesives, pest control, refurbishments, or stored chemicals). Ensure appropriate safety measures are in place when VOC use is required, and verify that isolation/sealing and ventilation procedures prevent VOC migration to other areas.

Add a local outdoor reference monitor. To better understand site-specific influences on indoor air quality, consider installing an outdoor air quality monitoring device at or near the building. A local reference would enable more accurate quantification of outdoor-to-indoor pollutant transfer, improve ventilation/filtration optimization during episodic events, and increase confidence in conclusions compared to reliance on a distant reference station.

References:

1. Papadogeorgou, G., et al. (2019). Low levels of air pollution and health: Effect estimates, methodological challenges, and future directions. *Current Environmental Health Reports, 6,* 105–115.

2. Global Open Air Quality Standards (GO AQS). (2025). *Global Open Indoor Air Quality Standards: A Unified Framework, November 2025, Version 1.0;* ISBN: 9798274916158

3. Satish, U., et al. (2012). Is CO_2 an indoor pollutant? Direct effects of low-to-moderate CO_2 concentrations on human decision-making performance. *Environmental Health Perspectives, 120,* 1671–1677.

4. Allen, J. G., et al. (2016). Associations of cognitive function scores with carbon dioxide, ventilation, and volatile organic compound exposures in office workers: A controlled exposure study of green and conventional office environments. *Environmental Health Perspectives, 124,* 805–812.

5. RESET™. (2018). *RESET Air Standard for Commercial Interiors v2.0.*

6. European Committee for Standardization. EN 15251: *Indoor environmental input parameters for design and assessment of energy performance of buildings.*

7. World Health Organization. (1987). *Health impact of low indoor temperatures.* WHO Regional Office for Europe.

8. World Health Organization. (2009). *WHO guidelines for indoor air quality: Dampness and mould.*

9. Mofidfar, M., et al. (2024). Dependence on relative humidity in the formation of reactive oxygen species in water droplets. *Proceedings of the National Academy of Sciences, 121*(12).