U.S. General Services Administration

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OCCUPANCY COUNTING: OCCUSPACE EVALUATION



Occupancy Sensor with Minimal IT-Security Requirements

Accurate, real-time occupancy data is essential for assessing space utilization, demonstrating compliance with statutory requirements, and guiding decisions on consolidation, downsizing, and reinvestment in existing facilities. Occupancy sensing can also be used to coordinate room booking systems, provide tenants with real-time information on traffic and quiet zones, integrate with building automation systems to optimize building and HVAC operations, and streamline custodial scheduling.

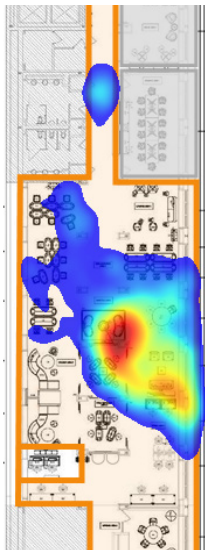
Under the Utilizing Space Efficiently and Improving Technologies (USE It) Act, Federal agencies are responsible for monitoring and reporting building occupancy data.[1] To support compliance, the U.S. General Services Administration (GSA) has developed guidance and has identified associated tools,[2] including occupancy tracking systems.

Occupancy tracking systems are intended to deliver highly accurate, customizable, real-time data. To test their real-world application, GSA piloted the Macro 4 and Micro 2 sensors from Occuspace Inc. (Occuspace).

INTRODUCTION

Heat Maps Under Development

GSA is conducting a pilot of Occuspaces's heat map technology on the 7th floor of 1800F. Occuspace anticipates full heat map functionality by March 2026.



"Occupancy sensors can provide more granular data than some other occupant-counting methods, and zoning capabilities can simplify data collection in multi-tenant spaces."

–Joshua Banis
Acting Director
Center for Emerging Building Technologies
U.S. General Services Administration

What Is This Technology

PLUG INTO STANDARD OUTLETS, ML ANALYZES WIFI/BLUETOOTH

Occuspace sensors plug directly into standard outlets to detect WiFi and Bluetooth signals from occupant devices. Machine learning models analyze device patterns to estimate occupancy, recognize overlap (e.g., one person carrying multiple devices) and filter out non-occupant signals (e.g., smart thermostats). Macro sensors are cellular-enabled and can count thousands of people. Manual headcounts help calibrate the system and accelerate learning. Micro sensors are used primarily for conference rooms, are powered by nearby macro sensors, count up to three people, and do not require calibration. Data can be exported and integrated with other applications and platforms—including BAS—either through an API or via data-streaming options for customized integration. These integration pathways were not tested as part of this assessment.No personally identifiable information is collected. The system supports multi-factor and single sign-on authentication.

What We Did

TESTED AT TWO GSA BUILDINGS

The vendor installed sensors at two GSA buildings: the John C. Kluczynski (JCK) Federal Building in Chicago, IL, and the GSA Headquarters Building (1800F) in Washington, DC. The evaluation area at JCK comprised two floors of around 21,000 SF each with a total of 17 sensors. The much larger 1800F study area was divided into 31 zones across seven floors and had 108 sensors installed. Sensors were installed in February of 2025, and results were evaluated through the first week of May. The evaluation assessed installation, usability, and accuracy compared to other GSA-recommended tools for data collection, including laptop and PIV card counting.

INSTALLATION

INSTALLATION WAS STRAIGHTFORWARD

The vendor installed sensors at both JCK and 1800F. Sensors arrived pre-programmed. At JCK, one person installed the sensors in 2–3 hours. Installation at 1800F involved multiple zones and took two people 6–8 hours to complete. Both deployments required additional time for manual headcounts and calibration.

DEVICE MOUNTING

Sensors plug into standard outlets, typically 18 inches above the floor, and cover 2,000–3,000 SF depending on zoning. Tampering is rare and even less likely with ceiling mounts. Power over Ethernet (PoE) installations use ceiling mounts with structured cabling, providing greater coverage per sensor but no performance advantage. Costs are the same for PoE and outlet installations.

CYBERSECURITY

The sensor system uses a cell signal to transmit data and requires no connection to the internet. There is no special IT integration or requirement for FedRAMP authorization.

FLOOR PLANS

Zone-level tracking requires basic floor plans; floor- or lobby-only counts do not. Multi-tenant buildings benefit most from zone tracking.

MANUAL HEADCOUNTS

Manual headcounts should be conducted 3–5 times per zone during the first week and logged in the dashboard. The vendor reports that accuracy does not improve beyond 8 counts. Recalibration is required if occupancy doubles, though the vendor anticipates future versions will eliminate the need for headcounts entirely.

DASHBOARD FUNCTIONALITY

The dashboard tracks average and peak occupancy, predicts trends for the next hour, and highlights peak hours, busiest day, and average dwell times. It auto-calculates utilization rates by zone or measurement area, with capacity inputs customizable to statutory or other requirements. Data can be viewed live or historically. User access is requested through a GSA Google form; once approved, the request is sent to the vendor to create the account.

Interactive Dashboard

Shows live and historical occupancy, predicts short-term trends, highlights peak use, and auto-calculates utilization rates by zone



FINDINGS

ACCURACY COMPARED TO MANUAL COUNTS At JCK and 1800F, manual headcounts were conducted immediately after installation and repeated when occupancy increased following additional employees' return-to-office. During field testing, Occuspace occupancy estimates were within 15% of manual headcounts, averaging 99% of observed occupancy. On average, Occuspace counts undercounted versus manual counts by about 0.6 people. For small groups (fewer than 20), differences were negligible. For groups of 20–40, the difference averaged less than one person. At higher occupancies (above 40), Occuspace reported about 3 fewer people on average than manual counts.

Occuspace reports 95% accuracy for occupancy counts once calibrated. However, different counting methods can produce varying totals, each with its own limitations. Manual headcounts, for example, are prone to human error and missing or duplicate counts.

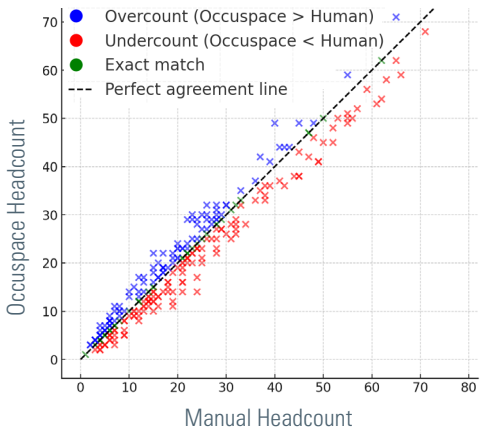
COMPARED TO LAPTOPS AND PIV CARDS GSA's laptop counting tool correlates users' IP addresses with the GSA-assigned IP address blocks designated to each building. Laptop counting accuracy is dependent on network setup, may be subject to duplicate or absent counts, and can be impacted by network interruptions Some GSA buildings have systems that track entrance into buildings via PIV badges. Over 36 days of data, Occuspace followed daily fluctuations closely, rising and falling in sync with PIV and laptop trends.

- **PIV counts** (at 1800F) were consistently the highest—they reflect building entries and exits, not necessarily people present in work zones.
- **Laptop counts** were generally lower than PIV but higher than Occuspace, especially at 1800F. They capture people logged into the network but may miss those working offline or on mobile devices.
- **Occuspace counts** were always the lowest, but they track zone-level presence more directly (actual people in spaces), making them different from PIV or laptop proxies.

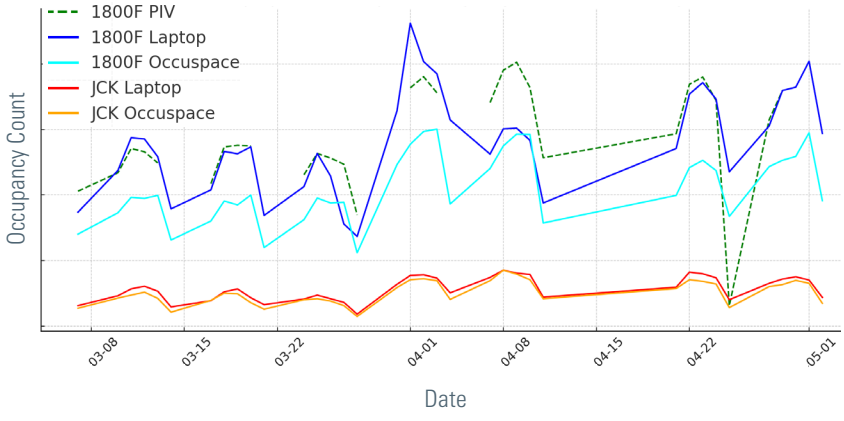
At 1800F, laptop counts averaged 1.33× higher than Occuspace. At JCK, laptop counts averaged only 1.14× higher than Occuspace. This suggests that in larger, more complex sites (1800F), laptop logins may inflate headcounts relative to physical presence, while in smaller sites (JCK), laptops and Occuspace align more closely—suggesting both are reliable for occupancy tracking.

Occuspace Closely Aligned with Manual Counts as well as Laptops

Occuspace Compared to Manual Counts*



Occuspace Compared to Laptops and PIV Cards



* 1800F calibration periods: February 27–March 3; April 23; May 7
JCK calibration periods: February 24–25; March 5; April 16–18

CONCLUSIONS

For more information, contact GSA's Center for Emerging Building Technologies
cebt@gsa.gov



Footnotes

[1] 40 U.S.C. § 584 (note); See also OMB Memorandum M-25-25 (Implementation of the Utilizing Space Efficiently and Improving Technologies Act) — PDF from White House / OMB, April 21, 2025

[2] USE IT Act and Occupancy Data, https://www.gsa.gov/real-estate/real-estate-services/for-federal-customers/use-it-act-and-occupancy-data, accessed 9/22/2025

Technology for GSA pilot provided by Occuspace.

Reference above to any specific commercial product, process, or service does not constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof.

Data Granularity and Costs

SAAS FEES PLUS INSTALLATION

The vendor's SaaS fees are determined by the level of data granularity required. Physical installation of the sensors is a separate fee.

Building-Level Traffic

To track building-level traffic, counting sensors are placed in each lobby or main entryway. No headcounts or calibration is required and resulting data is less nuanced than floor or zone-level tracking.

The cost for building-level traffic is $1,500/year, which includes two primary measurement areas. Each additional area costs $1,000/year. There is also an additional one-time setup fee of $300 per measurement area.

Floor- and Zone-Level Data

Tracking by floors or zones provides more detailed data metrics, including occupancy, traffic patterns and dwell times.

The cost is $0.12/SF/year with a one-time setup fee of $0.04/SF. The vendor expects installation fees to be reduced in the next year.

Deployment Recommendations

OCCUPANCY SENSORS CAN PROVIDE GROUND TRUTH FOR REAL-TIME UTILIZATION

Utilization Rates

- While laptops, PIV access, and occupancy sensors can all inform utilization rates, GSA only has laptop and PIV data for GSA-controlled spaces; tenant spaces will require another solution—such as occupancy sensors—to obtain reliable utilization data.
- PIV data may inflate occupancy when it only reflects entry. (Site dependent)
- Laptop data tends to overstate headcount compared to actual presence.

Real-Time Space Metrics

- Occupancy sensors (e.g., Occuspace) provide real-time, zone-level sensing.
- Laptop and PIV data are best used for historical trends or as supplemental context to sensor data.

BAS Integration

- Occupancy sensors are the most effective source for demand-driven HVAC and lighting control, delivering the required real-time, zone-level data.
- PIV and laptop data are valuable for portfolio-level analytics and reporting, but not suitable for building automation.