Lambent SPACES

EBOOK

Finding the “Sweet Spot” for Occupancy Analytics

A look at how occupancy analytics have evolved and what it means for businesses and institutions looking to optimize their use of space in 2025

Executive Overview

In October 2022, we launched Lambent Spaces, an occupancy analytics software platform. Our goal was to provide space planning and facilities management professionals with valuable insights about real estate utilization to help them make more informed decisions related to employee/student/visitor experiences, leases, maintenance and energy consumption.

At the time, businesses and higher education institutions were still reeling from the pandemic, the emergence of hybrid and remote work, and its impact on the use of space. Facilities management and space planning professionals were trying to help their organizations adjust to this new reality by getting a better understanding of utilization patterns and fluctuations - not just for rooms and floors, but for entire buildings, campuses and real estate portfolios.

Lambent Spaces took a 100% software-based approach that leveraged organizations' existing Wi-Fi infrastructure. This made it easier and less costly to deliver occupancy analytics across larger spaces and get users up and running faster while driving significant reductions in CapEx. The idea was not to replace sensors, it was to supplement them by providing a solution purpose-built for large-scale use cases.

This eBook takes stock of how the use of different occupancy analytics solutions has evolved and the opportunities that it creates for facilities management and space planning professionals going forward.

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Defining Occupancy Analytics

As the use of space continues to evolve on corporate and institutional campuses, flexibility and mobility are at the top of the agenda for the professionals tasked with planning and managing those spaces. Achieving that flexibility and mobility requires a deeper understanding of how spaces are actually being used. Occupancy analytics is a direct result of that growing need.

Occupancy analytics enables space planning, facilities management and operational professionals to understand how spaces are being occupied and utilized to identify peak activity times in each space, spot under-utilized areas, and highlight opportunities for improvement.

With this information, users can:

- Adjust environments fluidly to both user and organizational needs
- Ensure smooth operations in appropriately sized spaces
- Provide the optimal balance of shared and private areas
- Reduce operating costs by aligning facilities with actual requirements
- Schedule maintenance and cleaning schedules to align with actual space usage
- Manage power, cooling and heating more efficiently
- Inform future planning—about expansion, consolidation, modernization and repurposing of existing space

How Occupancy Analytics Works

As the name would suggest, occupancy analytics is a data-driven endeavor. It leverages technology and data collection to track the occupancy, usage and traffic flow patterns of offices, meeting rooms, classrooms, retail floors, and other public spaces. Modern occupancy analytics solutions typically involve one or more of the following components:

- **Sensors, IoT devices, or Wi-Fi networks** to collect occupancy data and transmit it to a centralized, cloud-based platform in real-time.
- **Advanced analytics techniques** including machine learning and AI to identify how space is being used.
- **Visual dashboards** which provide an understanding of true space utilization to help inform decision making.
- **Integration with other building management systems**, such as HVAC, lighting, and security systems, to optimize resource allocation based on occupancy.
- **Mobile apps** that allow employees or occupants to check space availability, find colleagues, or book meeting rooms in real-time.
- **Robust privacy and security measures** to protect occupant data and ensure compliance with data protection regulations.
- **Adaptive workplace features** to dynamically adjust office environments, such as lighting and temperature, based on real-time occupancy data to enhance comfort and energy efficiency.
- **Predictive models** to forecast future occupancy trends, helping organizations proactively manage space and resources.
- **Space optimization recommendations** for better space usage. This may include desk-sharing strategies, room reconfigurations, or expansion plans.

Occupancy analytics serves as a foundation for data-driven decision-making in office management, leading to more efficient, cost-effective, and adaptable workplaces that align with the needs and behaviors of employees, students and visitors.

If you want to delve deeper into occupancy analytics, this blog is a great place to start.

Sensors Are a Great Solution For Small Spaces

In 2020-2021, as businesses and institutions tried to respond to the pandemic, social distancing and hybrid work, sensors were a bright new shiny object that could solve an immediate problem—accurately counting people and occupancy in defined spaces. Sensors measure at a very fine grain on a relatively small scale. The challenge was (and still is) that if you wanted to measure lots of space, you needed lots of sensors. At the time, no one truly understood how rapidly they could or would be deployed across large real estate holdings, but they provided a point solution to a problem.

Today, few, if any organizations have deployed sensors across large spaces and structures. It costs money to procure, deploy, and maintain sensors, increasing drastically at scale. The ROI is far too unclear to warrant the time and expense to install them en-masse. There are also very real privacy concerns that have caused some businesses and higher education institutions to take them out of consideration entirely.

"The cost of **sensors at scale is impossible.** I need visibility in my new HQ and across my portfolio and compatibility with existing and future technology."

VP OF RE TECH INNOVATION
Financial Services Company

Accuracy Requirements Are Different For Different Types Of Spaces

Understanding that a room or space designed for 20 people is typically only being used by five people is valuable information. You can easily accommodate those five people in a smaller space. If the number is 10, you may assign another room or space. The difference at this level matters. Sensors, which provide approximately 95+% accuracy, are ideal for these types of use cases, i.e., small spaces, fewer people.

When it comes to large groups and spaces, you don't need that level of accuracy. If you have a space, e.g., a small auditorium with capacity for 200 people, +/- 20 people is not an issue. Cloud-based occupancy analytics software solutions that leverage existing Wi-Fi infrastructure are ideal for these scenarios. Occpancy counting from Wi-Fi approaches 90% accuracy. Accuracy will vary a little based on a number of factors, but the vast majority of decisions that need to be made about a floor or building can be made with confidence at this level.

"With badge data and sensors, we could only see who came in and if they sat in spaces with sensors. With Wi-Fi based solutions, we can see where people go even if there aren't any sensors there. And more importantly, how long they come and stay in the office. This allows us to plan for shared desks and hotel strategies."

WORKPLACE TECHNOLOGY SOLUTION ARCHITECT
Global Pharmaceutical Manufacturer

It's About Speed and Time-to-Data

Decisions are made about space and utilization every day. These decisions impact employee and organizational productivity, daily operational cost, and long term cost commitments. As such, it's important to have quick and easy access to occupancy analytics. The quicker you have access to more data, the more informed decisions can be made about space planning, lease renewals, and real estate construction, investment and divestment. Users, of course, also need to balance their need for speed with their need for accuracy - as discussed above. Both are part of enabling better decision making.

Sensor-based solutions provide more accuracy for smaller spaces, but they take time to install and it can take time to gather data from across larger spaces. In contrast, Wi-Fi based solutions allow you to start collecting data on spaces without waiting to install anything. **The time-to-data difference for a multi-million square foot deployment can be days with Wi-Fi vs. months to quarters with sensors.**

Some Wi-Fi-based solutions like Lambent Spaces also allow users to start at a broader level and then let the data analytics determine which spaces they need a deeper analysis of. For example, users can start at the floor level and then go back in time to analyze the occupancy and utilization at a more detailed level, e.g., zone, based on what they learn at the floor-level. As a result, there is no wasted time or financial investment.

"Having **actual data** transforms your ability to start the conversation about better space utilization."

ROB WYNKOOP, VP ADMIN & OPS
Purdue

Scale Is Important

Many organizations start using occupancy analytics in smaller spaces with the intention of expanding that use across larger spaces. The more they see the value of occupancy data, the more they want to expand their use of it, and the more they want the ability to easily share that data with other stakeholders across departments.

Sensor hardware is focused on counting individuals more accurately. It takes time to deploy sensors across millions of square feet. There is also the need for permitting, union labor for construction in certain geographies and disruption to normal operations.

Wi-Fi-based software solutions are focused on providing more valuable occupancy insights and intelligence at scale—for buildings, floors and zones. There is no installation. They can be set up in hours and quickly expanded based on the volume of space that needs to be covered.

> "Companies often respond to employee requests for more space by leasing additional areas. However, many organizations can optimize their existing, underutilized spaces to meet these needs without incurring extra leasing and operational costs. That's where occupancy analytics come in."
>
> **RICHARD SCANNELL**
> CEO, Lambent Spaces

Cost Always Matters

When facilities management and space planning professionals look at occupancy analytics, they want to understand what the total cost will be to get value. Those costs include both solution acquisition and ongoing management.

Sensors have a linear pricing structure which increases proportionately as the implementation scales, i.e., if one costs $100, twenty cost $2,000. In addition, there are costs for installation, power and equipment maintenance for each sensor. And then there are analytics subscription costs which can run $200-$300 per year, per sensor.

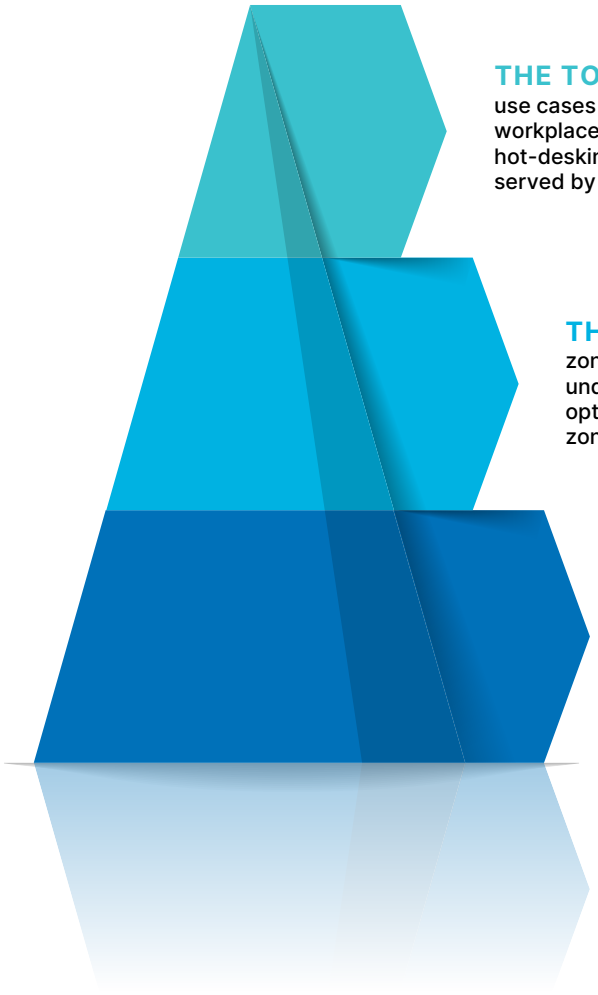
Wi-Fi based solutions offer the ability to scale the implementation to cover larger spaces. There are no additional costs for installation, power or equipment maintenance. It's all included in the software-as-a-service.

A “Fit-For-Purpose” Approach

Two years ago, the concept of occupancy analytics was fairly new, and facilities management and space planning professionals were not fully aware of what was possible with their existing Wi-Fi infrastructure.

Today, that’s no longer the case. The businesses and institutions we speak with know they need more data about how their spaces are used so they can make better decisions about management, maintenance, investment, divestment and repurpose.

Technology has evolved to meet that need—from point-in-time surveys and hardware and badges to real-time occupancy data access. Users have a lot more options and understand that different spaces require different approaches. To do that, many are adopting a “fit for purpose,” multi-tech strategy—a mixture of technologies serving different purposes to meet those needs. The graphic below visualizes this fit-for-purpose approach to occupancy analytics.



THE TOP OF THE PYRAMID REPRESENTS

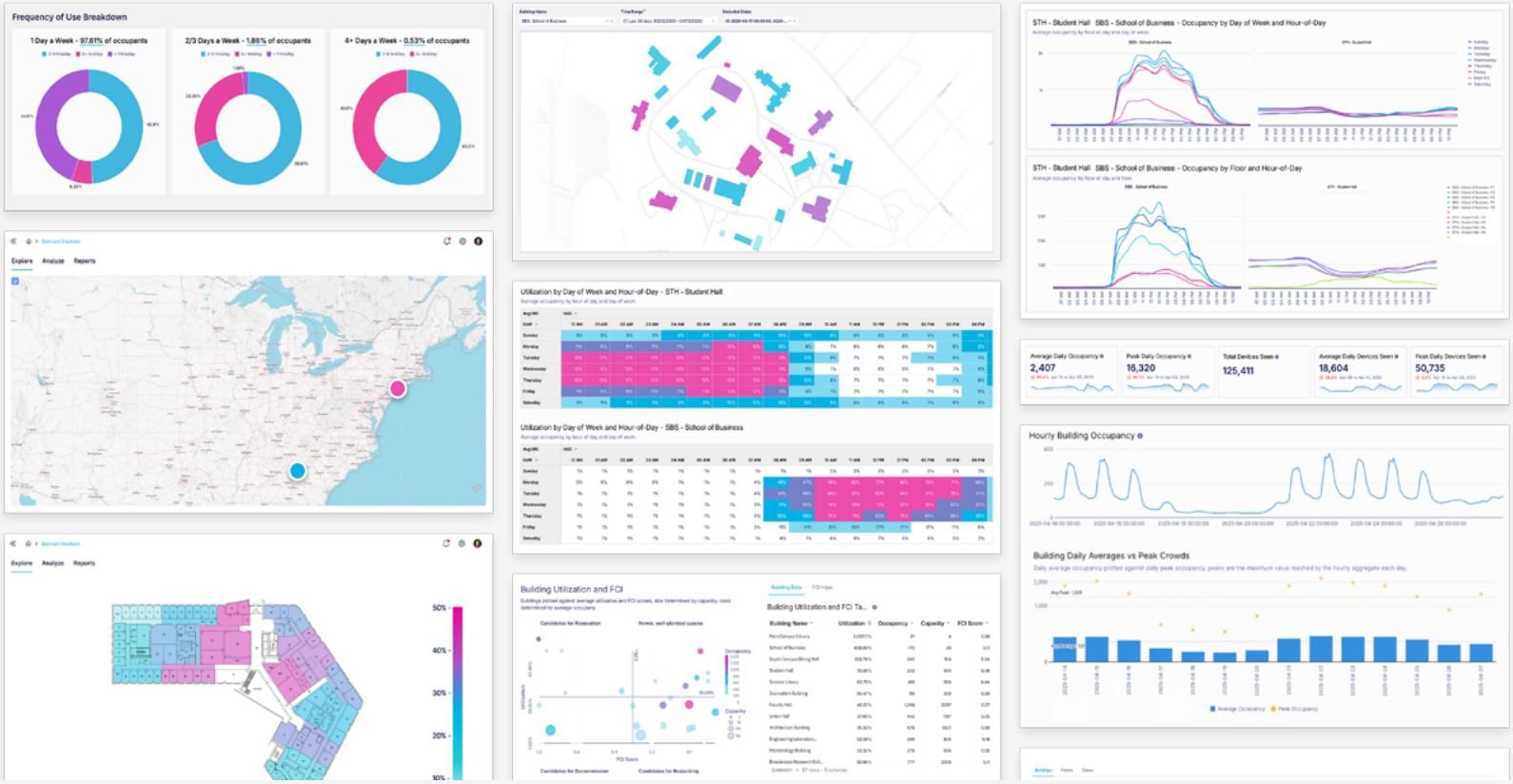
use cases involving small numbers of people in smaller spaces. These typically serve workplace management teams and inform tasks like validating room bookings, managing hot-desking and hoteling, and right-sizing conference rooms. These use cases are best served by occupancy sensors and time to value is typically 3-6 months.

THE MIDDLE OF THE PYRAMID REPRESENTS

zone-level use cases. Facilities and space management teams are looking to understand departmental space usage, right-size space allotments, restack, and optimize building services. These use cases are best served by zone-level Wi-Fi and time to value is typically 1-2 months.

THE BASE OF THE PYRAMID REPRESENTS

floor- and building-level use cases. Real estate leaders are looking to understand usage vs. capacity and overall traffic through a space over a period of time to inform decisions related to return-to-office space requirements, lease management, heating and cooling, deferred maintenance, flexible “swing” spaces and deciding between new construction or repurposing existing space. The larger space footprint involved makes these use cases ideal for floor-level Wi-Fi. Time to value is as little as 3 weeks.



Embedding Occupancy Analytics Into Building Intelligence Systems

We continue to hear from large property management companies about the concept of intelligence systems for buildings. These systems consolidate core information services for building managers and tenants in a single platform. Occupancy is quickly becoming one of those fundamental information services and provides multiple benefits, e.g.:

CLEANING AND MAINTENANCE

If there's only 20 people in the building on Monday and 400 on Tuesday, maintenance can send a different number of cleaners into that building on those two different days.

POWER AND ENERGY

If we know that a floor is empty during certain periods, facilities management can adjust heating and cooling accordingly.

SPACE PLANNING

Lease Management can support divestment strategies; workplace designers can leverage data to reconnect employees with the office; HR and executive leadership teams can measure flexible work policy adherence and space requirements.

IWMS

Data around actual utilization - not just reservations and assignments - can inform decisions. Additionally, utilization in non-reservable spaces can help inform workplace design and locate swing space.

As demand for occupancy data has increased, so has the number of technologies trying to capture it. Facilities leaders responsible for big picture decisions like leasing, purchasing, or selling buildings need consistent, uniformed occupancy data across the entirety of their real estate portfolio - preferably through a single dashboard or viewpoint.

Measuring Flexible Work Policies: The Transformative Power of Dwell Data

As organizations embrace flexible work policies, the conversation around workplace design is rapidly shifting. The focus is no longer just on how many people are in the office, but on how long spaces are being used and what that reveals about evolving needs. Dwell data—the measurement of the average amount of time occupants spend within your buildings—offers a new perspective for understanding and optimizing your spaces for flexible work.

Dwell data fundamentally changes how people interact with your spaces by providing insights into patterns of use, not just momentary headcounts or desk reservations. Where traditional occupancy metrics might tell you a room is used, dwell data reveals how long different areas are occupied throughout the day or week. This deeper understanding enables workplace planners and facilities managers to:

- Identify which areas are consistently used for focused work, collaboration, or brief visits
- Pinpoint underutilized zones that could be reimagined for higher value activities
- Tailor environments to match both organizational objectives and evolving employee expectations
- Optimize the allocation of resources-such as cleaning, maintenance, power, and HVAC-based on actual patterns of use rather than assumptions
- Support ongoing adaptation as flexible work patterns evolve, ensuring spaces remain relevant and cost-effective

Dwell Data in Action: Designing for Dynamic Use

Consider a building where dwell data reveals high population churn—many people come and go throughout the day, but few remain for extended periods. This pattern indicates that most users are visitors, not long-term occupants. In such a scenario, the space should be reimagined to support touchdown work: open seating, flexible desks, and collaborative zones that accommodate short stays and spontaneous meetings, rather than dedicated offices that would likely sit empty much of the time.

On the other hand, dwell data may also highlight a group of spaces that are occupied five days a week for six or more hours each day. These areas are clearly supporting more sustained work. Providing assigned desks or private offices in these zones supports productivity and well-being, while ensuring the rest of the space remains adaptable for the more transient population.

Unlocking the Full Value of Flexible Work

By integrating dwell data into your workplace analytics, you move beyond surface-level metrics and gain actionable insights into how flexible work policies are shaping your spaces. This empowers organizations to:

- Achieve a more efficient balance between shared and private spaces
- Reduce operating costs by aligning space allocation with actual demand
- Foster a workplace experience that supports both flexibility and productivity, enhancing satisfaction and retention

Dwell data is more than a metric; it's a strategic tool for designing spaces that work as dynamically as your workforce. With this level of understanding, organizations can confidently redesign their environments to meet the needs of both today's flexible workers and tomorrow's evolving teams.

Smart Space Planning in Action

Below are brief examples of different types of organizations leveraging Wi-Fi based occupancy analytics to drive tangible value and ROI. Consider how these examples relate to your own situation to help inform your use of occupancy analytics.

LARGE MIDWESTERN UNIVERSITY

Goals	• Improve utilization of offices, classrooms, and other campus spaces to meet growing enrollment and workspace needs • Maintain current cost structure - for both students and institution
Solution	• Wi-Fi based occupancy analytics solution to identify buildings with highest levels of under-utilization and high costs for deferred maintenance • Continuous occupancy data to identify nine computer labs under 50% utilization – freeing up 10,000+ sq. ft. of space for repurposing
ROI	• $14M in net cost avoidance to build out new space • 8X increase in student study space • New hybrid work and collaboration spaces

GLOBAL MEDICAL DEVICE MANUFACTURER

Goals	• Meet growing space demand due to rapid increase in workforce • Understand current usage of existing desk beyond people counting • Distinguish between utilization of different types of workspaces, e.g., specialized labs vs. traditional desks • Inform decisions regarding new space leases and investments
Solution	• Wi-Fi based occupancy analytics solution deployed across the worksite • Advanced analytics analyzing zone occupancy, dwell times and usage patterns throughout the day • Tailored reporting with actionable insights
ROI	• Cost avoidance to lease additional office space • Informed space redesign projects to match actual use of space by engineering teams • Validation of flexible work strategies

Get Fit For Your Occupancy Analytics Needs

Whether owned or leased, real estate represents a significant investment for most businesses. And like any investment, stakeholders expect the optimal return on investment by making informed decisions related to employee and visitor experiences, leases, maintenance and energy consumption. Occupancy analytics can deliver the data insights that businesses need to inform those decisions, but different space planning challenges require different types of solution approaches. As you consider how to advance the occupancy analytics efforts within your organization, take into account the size of the space and accuracy level needed to make good decisions, the “time-to-data” required to effectively inform those decisions, and how it may need to scale across the corporate campus.

For more information: visit **lambentspaces.com**

Lambent SPACES

About Lambent Spaces

Lambent is an occupancy analytics software company helping corporate and higher ed campuses optimize space utilization, facilities operations and real estate investments. Its SaaS platform, Lambent Spaces, leverages existing data sources such as Wi-Fi and sensors to provide anonymous and predictive analytics to inform decisions related to utilization, workplace experiences, planning, scheduling, and maintenance. The software delivers actionable intelligence so facilities professionals and space planners can make better use of the spaces they have.

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