Steelcase Workplace Advisor Study

Understanding + Technical Overview

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Steelcase

Understanding Workplace Advisor Study

Steelcase Workplace Advisor Study is a point-in-time space measurement tool that reveals what people want and use to optimize an organization's investment in major space change. Discover what's working and what's needed by conducting a Workplace Advisor Study. Over a 4- to 12-week period, Study uses sensors to gather anonymous space utilization data and surveys to understand user perspectives. Data is displayed in a user friendly dashboard. Analysis is captured in a custom report with expert consultation to help you translate findings into high-impact action steps. Study provides everything you need to confidently create the most effective workspaces for your organization.

Workplace Advisor Study includes the following components:

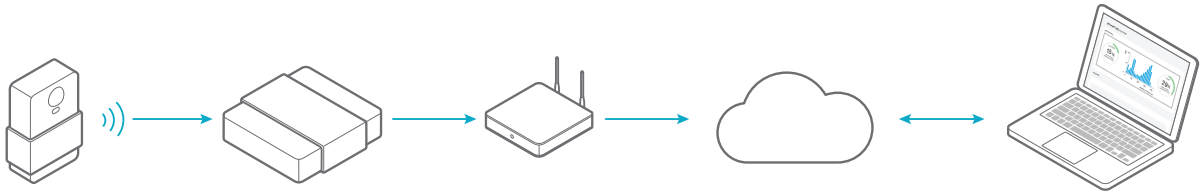
Presence sensors installed in the workspace detect motion with passive infrared (PIR) technology. These sensors do not have the technical ability to capture video, audio or personal information.

Gateways store and send secure occupancy data over the internet to the Steelcase platform through a Steelcase-provided modem or your network. All network traffic is initiated from the gateway to the platform. Data is collected and housed within the gateway whether or not there is an active connection with the Steelcase platform, ensuring uninterrupted data capture.

Steelcase platform receives data via SSL-encrypted channels from the gateway. In this cloud storage platform, data is processed via an algorithm to determine occupancy and efficiency of a space over time.

Workplace Advisor Study dashboard requires a secure login to analyze the data collected and stored throughout the study.

HOW WORKPLACE ADVISOR STUDY WORKS



Presence sensor | **Wireless gateway** | **Modem or customer network** | **Steelcase cloud-based platform powered by Microsoft Azure®** | **Dashboard**

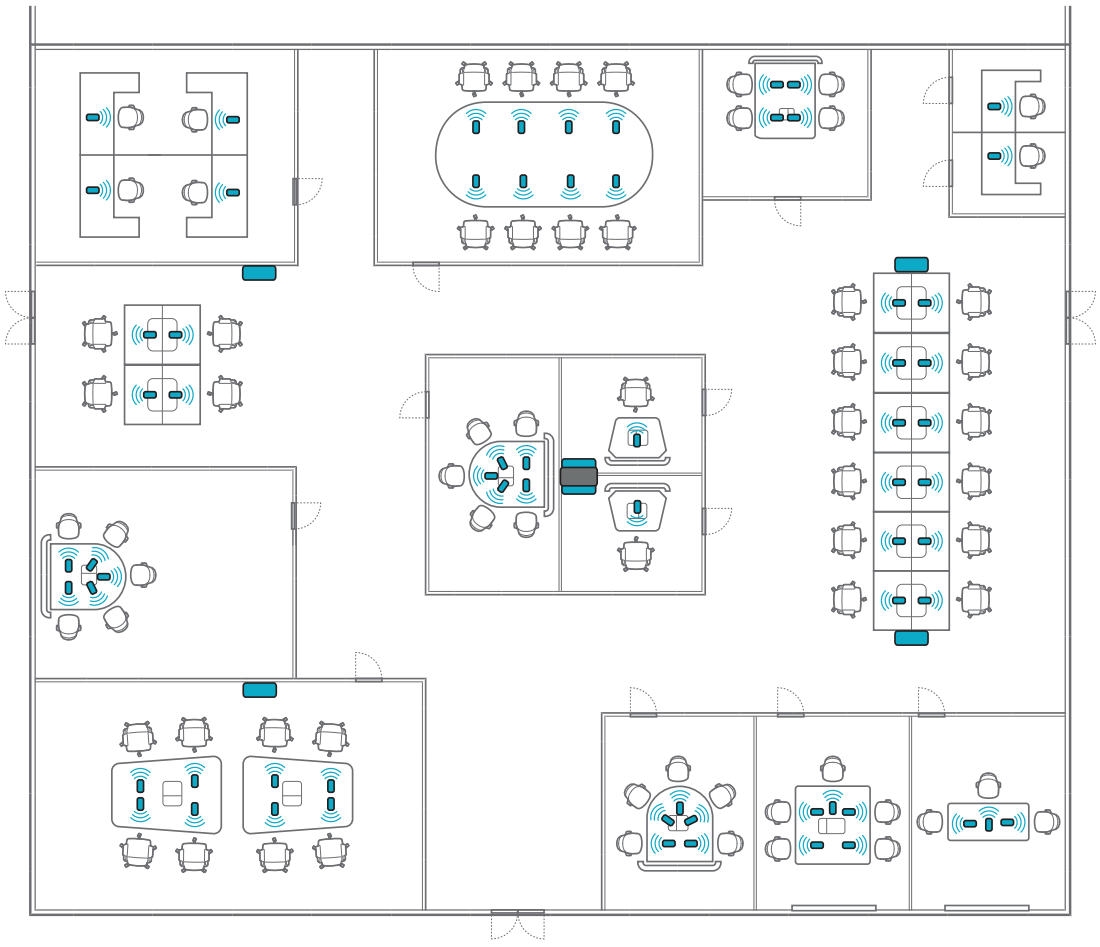
Sample Floorplan Installation

This map shows how Workplace Advisor Study hardware is placed within a space to measure occupancy and performance.

Sensors
Table-mounted, battery-powered PIR sensors detect motion and ambient temperature to determine whether a space is occupied or unoccupied.

Gateway and modem
Gateways collect the occupancy data from each sensor. Each individual gateway is connected via Ethernet to a Steelcase-provided cellular modem that independently transmits that gateway's occupancy data to the Steelcase cloud platform. An additional backup of the data is stored locally on each gateway in case of cellular outages.

Mesh nodes
Nodes provide additional pathways for sensors to connect to gateways, effectively extending the range of gateways and making the connections more resistant to interference.



Implementation Journey

Here is a step-by-step summary of a typical experience of the planning and installation of a Workplace Advisor Study system.

1: PLAN + SPECIFY

Determine the study floorplans: Your facility manager provides a detailed floorplan. Our team determines where to place sensors and gateways.

Prepare project plans: We work with your team (facility manager, IT point of contact, project manager) to discuss and clarify milestones, schedule, roles and responsibilities.

Receive communication materials: Steelcase provides messaging and materials you can use to encourage employee participation.

Conduct kickoff: Steelcase will lead a kickoff conversation to understand your organizational needs and questions you wish to answer with data. Our Customer Experience Leader will discuss timeline and logistics and answer any initial questions. We will set up any additional conversations based on your needs and preferences.

2: INSTALL + MONITOR

Install devices: Our installation team will arrive onsite outside of business hours, walk the site with your facilities contact to ensure accurate understanding of your space and document relevant space traits (e.g., natural light, whiteboards, etc.). We will install gateways and sensors, validate that the system is working and that data is being collected accurately. Signage of your choosing is placed within the space to support employee awareness and expectations.

Activate dashboard: Select employees will receive access to the dashboard as soon as 14 days after device installation to monitor data collection. Once your dashboard is live, our Customer Experience Leader will provide a tutorial and answer any questions.

Survey employees: Our Customer Experience Leader will work with you to set up brief employee surveys to better understand favorite spaces and space traits. We will monitor survey responses and suggest reminder emails if response rate is low.

(Optional) Understanding the employee voice: You may choose to receive onsite consulting services including primary observation, user focus groups and interviews.

Implementation Journey (continued)

3: DEINSTALL + CONSULTATION

Remove devices: The Steelcase team will arrive and remove all sensors and gateways and walk the site with your facilities contact to ensure that deinstallation is complete.

Consultation: You receive four hours of onsite consultation with our Steelcase Applied Research + Consulting (ARC) team. ARC will review the dashboard with you, help you interpret data and examine the meaning of usage patterns. This four-hour consultation allocation can be split and scheduled based on your preference.

Custom report: As part of your ARC consultation, you will receive a custom report documenting key findings and considerations based on data gathered and insights gained.

Dashboard continues: Study dashboard pages remain live for you to access for 90 days following dashboard interpretation.

(Optional) New ways of working: You may choose to receive additional onsite consulting services preparing employees for success in a new and different work environment.

Technical Specifications

GATEWAY SPECIFICATIONS	
Color	White
Dimensions	5.7" x 5.5" x 1.5"
Wireless Communication	IEEE 802.15.4, 2.4GHz IPv6 sensor
Power	External AC/DC power supply, 12V, 2A internal 2000mAh Li-ion UPS battery
CERTIFICATIONS	FCC and RoHS

SENSOR SPECIFICATIONS	
Color	White
Battery	5 years (depending on use)
Dimensions	Presence: 3.8" x 4.4" x 2.2", Presence Mini: 3.1" x 1.5" x 0.75"
Detection Range	16' to 82' line of sight
CERTIFICATIONS	FCC and RoHS

PIR BASED MOTION DETECTION
Up to 5m (Presence Mini) or 10m (Presence) Motion detection distance
82° (Presence Mini) or 100° (Presence) Vertical field of detection
94° (Presence Mini) or 90° (Presence) Horizontal field of detection

TEMPERATURE MEASUREMENT	
Range	+5°C to +50°C
Tolerance	±2°C (Presence Mini), ±1°C (Presence)

WIRELESS PERFORMANCE	
IEEE 802.15.4 2.4 GHz IPv6 sensor network supporting mesh technology	
Omnidirectional internal antenna	
Automatic security key management using ECC with AES encrypted communication	
Wireless Output Power	3 dBm-8 dBm (~2-6.3 mW)
Wireless Range	5-25m indoor, 50-100m Line of Sight (Indicative)
Agency Approvals	CE, FCC, RoHS

ENVIRONMENTAL REQUIREMENTS	
Operating Requirements	+5°C to +50°C, 20-80% RH (non-condensing)
Storage Requirements	0°C to +50°C, 20-80% RH (non-condensing)
Designed for indoor use only	

Sensor ISM Band Overview

SUMMARY

- Sensors use **IEEE 802.15.4 low power radio,** which does not interfere with Wi-Fi and Bluetooth
- Sensors communicate rarely compared to Wi-Fi and with very **low output power**
- Bluetooth is very **resilient against interference** from IEEE 802.15.4 and Wi-Fi

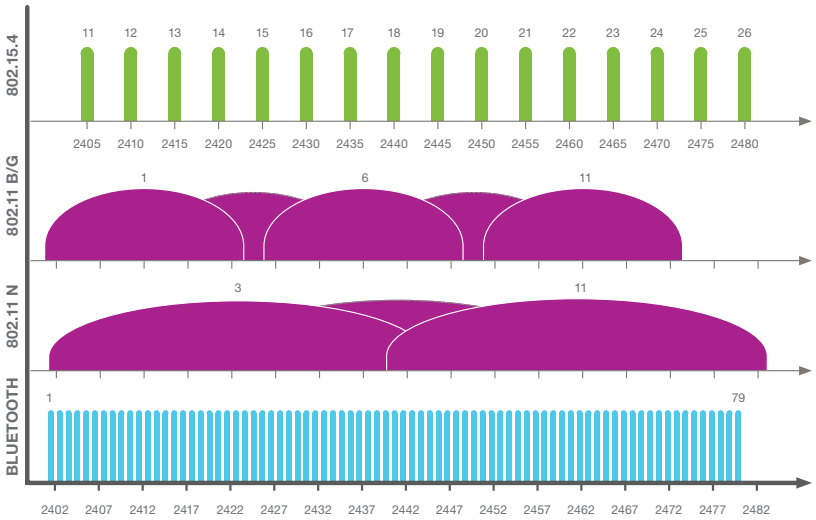
IEEE 802.15.4, WI-FI, BLUETOOTH ON 2.4GHZ SPECTRUM

IEEE 802.15.4
- 16 channels
- 250 kbps per channel
- 2 MHz bandwidth per channel

IEEE 802.11 B/G (WI-FI)
- 11 channels in US
- 13 channels in Europe
- 22 MHz bandwidth per channel

IEEE 802.11 N (WI-FI)
- 20 MHz or 40 MHz bandwidth per channel

BLUETOOTH
- Originally standardized by IEEE 802.15.1
- Maintained by Bluetooth SIG
- Frequency-hopping spread spectrum
- 800 hops per second
- 79 channels
- 1 MHz bandwidth per channel



RADIO TRANSMIT POWER

Wi-Fi radiates over 10,000 times more energy than IEEE 802.15.4

POWER LEVEL	POWER	USAGE	NOTES
80 dBm	100 kW	100%	FM radio stations with 50 km range
60 dBm	1000 W	100%	Typical combined radiated RF power of microwave oven elements
50 dBm	100 W	100%	Typical total thermal radiation emitted by a human body, peak at 31.5 THz
33 dBm	2 W	100%	Max output from a 3G mobile phone (power class 1)
30 dBm	1 W	100%	Typical RF leakage from a microwave oven
23 dBm	0.2 W	30%	Wi-Fi (IEEE 802.11 n), streaming video
20 dBm	0.1 W	30%	Wi-Fi (IEEE 802.11 g), streaming video
4 dBm	0.0025 W	10%	Bluetooth class 2 radio, 10 m range
3-8 dBm	0.002-0.006 W	0.1%	Sensor with IEEE 802.15.4 IoT radio

SECURITY OVERVIEW

For detailed privacy and security information,
visit **www.steelcase.com/workplace-advisor-study**

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