CLOUDSWITCHED

FREE RESOURCE — GUIDE

WiFi Site Survey Guide

Wireless site survey methodology, heat mapping, AP placement strategy, and capacity planning. Design reliable, high-performance WiFi coverage for your workspace.

4	-65dBm	Heat Map	Free
SURVEY PHASES	MINIMUM SIGNAL TARGET	VISUAL COVERAGE MAPPING	SURVEY GUIDE

Why Site Surveys Matter

Deploying access points without a site survey is guesswork. Too few APs creates dead zones and poor performance. Too many creates co-channel interference. A professional site survey ensures optimal placement, correct AP count, and reliable coverage.

1 Pre-Survey Planning

Gather information and prepare before conducting the physical survey.

→ **Obtain floor plans:** Get accurate CAD or PDF floor plans showing walls, doors, furniture layout, and ceiling height

→ **Identify user density:** Map where users work, meet, and congregate. High-density areas need more AP capacity.

→ **Define requirements:** Minimum signal strength, maximum client count per AP, supported applications (video, voice, data)

→ **Identify materials:** Wall construction (plasterboard, brick, glass, concrete) affects signal propagation. Concrete and metal attenuate heavily.

→ **Note existing infrastructure:** Ethernet drops, PoE switch availability, cable run distances, ceiling type

→ **Choose survey tools:** Ekahau, NetSpot, or Acrylic WiFi for professional surveys with heat map output

WALL MATERIAL	SIGNAL ATTENUATION	IMPACT
Plasterboard (drywall)	3–5 dB	Low — signal passes easily
Glass (standard)	2–4 dB	Low — minimal impact
Brick (single)	6–10 dB	Medium — noticeable reduction
Concrete (reinforced)	10–20 dB	High — significant barrier
Metal (lift shafts, ducts)	15–25 dB	Very high — near-complete block

2 Conducting the Survey

Walk the site systematically to measure RF characteristics and identify optimal AP locations.

Predictive survey: Using floor plans and material data, model AP placement in survey software before visiting the site. This gives a starting point for the physical survey.

Active survey: Walk the entire floor plan with a survey device connected to a test AP. Measure signal strength, noise floor, and throughput at each point. Ensure you cover corridors, meeting rooms, kitchens, and any outdoor areas.

- → **Signal targets:** Primary work areas: ≥ -65 dBm. Secondary areas (corridors, kitchens): ≥ -70 dBm. VoIP/video areas: ≥ -60 dBm with SNR ≥ 25 dB.
- → **Channel planning:** Design for minimum 25 dB separation between co-channel APs. Use channels 1, 6, 11 on 2.4 GHz. Use non-overlapping channels on 5 GHz.
- → **Capacity planning:** Enterprise APs typically support 30–50 concurrent clients comfortably. Plan for peak occupancy, not average.
- → **AP mounting:** Ceiling-mount is ideal at 2.5–3m height. Avoid mounting near metal ducts, above dropped ceiling tiles only, or in enclosed spaces.

Common Mistake: Not Surveying Fully Furnished

An empty office surveys very differently to a fully occupied one. People, furniture, and equipment all absorb and reflect WiFi signals. If surveying before fit-out, apply a 3–5 dB margin to account for furnishing.

3 Heat Map Analysis & AP Placement

Analyse the survey data and finalise access point placement.

Generate heat maps showing signal strength, signal-to-noise ratio, and channel overlap across the floor plan. Identify areas below your minimum signal target and adjust AP placement accordingly.

- → **Green zones** (≥ -65 dBm): Adequate coverage. No changes needed.
- → **Yellow zones** (-65 to -70 dBm): Marginal. May be acceptable for low-demand areas but not for VoIP/video.
- → **Red zones** (< -70 dBm): Insufficient coverage. Add or reposition APs.
- → **Overlap zones**: Ensure 15–20% overlap between adjacent APs for seamless roaming. Too much overlap causes co-channel interference.

AP Count Rule of Thumb

For modern open-plan offices: 1 AP per 30–40m² for high-density use (1 device per person). For meeting rooms: 1 AP per large meeting room (10+ people). For warehouses: 1 AP per 100–150m² depending on racking and materials.

4 Post-Deployment Validation

After installation, conduct a validation survey to confirm coverage meets targets.

- ☐ Conduct a **validation walk-test** with all APs installed and operational
- ☐ Verify **signal strength** meets targets in all primary work areas
- ☐ Test **roaming** between APs while on a voice/video call — no drops or re-authentication
- ☐ Verify **throughput** meets requirements (minimum 50 Mbps per client for general use)
- ☐ Check for **co-channel interference** and adjust channels if needed
- ☐ Test with **peak client load** if possible to verify capacity
- ☐ Generate **final heat maps** and include in handover documentation
- ☐ Provide **as-built documentation** showing final AP locations, channels, and power levels

Notes

info@cloudswitched.com
New London House, 6 London St, London EC3R 7LP

Prepared by: ______________ Date: ______________ Approved by: ______________