Improving Public Sector Wi-Fi Connectivity:

An Ekahau Guide



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Reliable wireless connectivity powers nearly every aspect of modern government operations. From digital services in libraries and city halls to smart systems in courthouses and secure agency buildings, public sector networks support employees, constituents, and critical infrastructure—all while managing thousands of connected devices behind the scenes.

However, providing high-performance wireless connectivity in the public sector presents unique and persistent hurdles. Public sector deployments face intense scrutiny over the use of taxpayer funds, demanding maximum value and long-term performance from every investment. Government networks must also meet stringent security requirements to protect sensitive data while navigating the physical constraints of older buildings and restricted-access zones.

This guide is designed to help public sector IT teams navigate the complex realities of government Wi-Fi deployments. Inside, you'll find practical, proven solutions to design, validate, and optimize networks to keep pace with growing demands and support the agencies and communities they serve. To help IT teams meet those challenges, Ekahau delivers industry-leading tools for Wi-Fi design, troubleshooting, and optimization, ensuring dependable connectivity across every government environment.

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Understanding Key Public Sector Wi-Fi Challenges

Government agencies operate in some of the most demanding environments for wireless connectivity. The architectural diversity of public buildings, combined with strict security protocols and limited budget flexibility, puts added pressure on IT teams to get network design right the first time.

Meeting these demands requires careful planning, the right tools, and a clear understanding of each environment's constraints. Here are some of the key challenges:

- **Challenging and Diverse Physical Environments**
- **Stringent Budgetary Cycles and Public Accountability**
- **Critical Security and Data Control**
- **Geographically Dispersed Networks with Limited On-Site Staff**

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Challenging and Diverse Physical Environments

The public sector manages every type of environment imaginable, often with additional layers of complexity.

Historical Architecture

Many government buildings are older, historic structures made with thick, signal-blocking materials like stone, concrete, and sandstone. These buildings also come with strict aesthetic requirements, which can severely limit where access points and cabling are placed, sometimes making it impossible to drill through walls or run visible conduit.

Restricted Access Zones

Secure environments like law enforcement buildings, server rooms, and classified government facilities can present major access challenges. IT teams may be restricted from entering certain areas, and in some highly secure projects, survey equipment and floor plans must remain on-site, with all data deleted before departure.

Dense Building Materials

Government buildings are often constructed with dense, durable materials that absorb and block Wi-Fi signals, leading to reduced coverage and slower speeds.

Outdoor and Public-Facing Spaces

Municipalities are increasingly expected to provide Wi-Fi in outdoor areas like parks, town squares, sports fields, and even along main streets using APs on light poles. These large, open areas require careful design to ensure proper coverage and signal propagation.

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Stringent Budgetary Cycles and Public Accountability

Public sector projects operate under different financial realities than private enterprises:

Long Refresh Cycles

Unlike the 3-5 year refresh cycle common in the private sector, public sector networks often remain in place for 5-10 years or even longer.

Future-Proofing is Critical

With network upgrades happening so infrequently, it's essential to deploy technology that can stand the test of time. That often means adopting cutting-edge standards like Wi-Fi 7 today to support the applications and demands of tomorrow.

"Feast or Famine" Budgets

Funding for government technology projects can be inconsistent. When budgets are approved, there is often pressure to fully allocate those funds before the end of the fiscal year. That can sometimes result in overdesign or larger-than-necessary deployments, based on the uncertainty of future funding.

Public Accountability

Because every dollar is subject to scrutiny, IT teams must justify their design and hardware choices with meticulous planning and clear documentation to demonstrate responsible use of public funds.

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Critical Security and Data Control

Security is paramount for government networks, which are responsible for transmitting and protecting sensitive citizen data and classified information:

Air-Gapped and Offline Requirements

Many government and defense facilities operate in classified, air-gapped environments where cloud-based tools are strictly off-limits. Floor plans, network layouts, and other sensitive data must stay on-site at all times, which means Wi-Fi design and analysis tools need to function fully offline—no exceptions.

Identifying Threats

An on-site survey with the Ekahau Sidekick 2 makes it easy to spot unauthorized rogue APs, non-Wi-Fi interferers (such as wireless cameras or jammers), and access points using weak or outdated encryption protocols. While many vendor dashboards can flag some of these issues, an on-site survey provides a crucial snapshot in time to validate your network's security position.

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Geographically Dispersed Networks with Limited On-Site Staff

Security is paramount for government networks, which are responsible for transmitting and protecting sensitive citizen data and classified information. That responsibility becomes even more complex when networks span multiple locations with limited technical support on the ground:

Multiple Sites, One Central Team

Many agencies operate from a central administrative hub while managing dozens of smaller, distributed sites, such as regional offices, libraries, or DMVs.

Limited On-Site Expertise

Remote offices and facilities often lack dedicated IT staff, making it impractical for the central team to handle regular maintenance, troubleshooting, or validation in person.

Delegated Data Collection

To maintain network performance across all sites, central IT teams need tools that allow non-technical staff in remote locations to collect Wi-Fi data and securely transmit it to a core team for expert analysis.

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Ekahau Solutions for Public Sector Wi-Fi Excellence

Ekahau helps public sector IT teams maximize wireless network performance throughout the entire Wi-Fi lifecycle with our comprehensive focus on Wi-Fi design, troubleshooting, optimization, and security.

Below, we detail how Ekahau's industry-leading tools streamline critical phases of network management, from new network design and validation to ongoing optimization and troubleshooting, ensuring robust connectivity across even the most challenging government environments.

Ekahau Product Suite

Everything you need for always-great Wi-Fi

SOFTWARE

Ekahau AI Pro



Powerful Wi-Fi planning and AI design for the most reliable, best performing 2.4/5/6 GHz wireless networks.

Design, analyze, optimize and troubleshoot enterprise Wi-Fi networks.

One-time investment in software.
Ekahau Connect Subscription required.

HARDWARE

Ekahau Sidekick 2



The fastest, most precise Wi-Fi testing and measurement device, supercharged and tuned for 2.4/5/6 GHz.

Walk to collect measured data to validate & optimize any wireless network.

One-time investment in hardware.
Extended warranty available.

SUBSCRIPTION

Ekahau Connect Subscription



- Ekahau AI Pro Online
- Optimizer Step-by-Step Configuration Guides
- Survey Mobile App Wi-Fi Health Validation
- Analyzer Mobile App Live Troubleshooting
- Insights Wi-Fi Performance Analytics
- Packet Capture
- Cloud Project Sync with Guest Sharing
- Software & Firmware Updates
- Latest AP Models & Dashboard Integrations
- Global Customer Support

Annual software maintenance and support.
Sidekick 2 required to use all features.

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Empower Your Team with Expert-Level Skills

Deploying the industry's best tools is the first step. The second is ensuring your team has the certified expertise to solve your unique public sector challenges.

Government agencies depend on reliable wireless connectivity to power essential operations, from administrative systems and secure communications to emergency response networks, building access controls, and online public portals. Designing those networks can be incredibly complex, with historic architecture, dense building materials, and highly secure facilities all adding layers of difficulty that make reliable coverage difficult to provide.

The challenges of designing Wi-Fi in public sector spaces require a deep understanding of wireless design principles and the technical skills to execute them effectively. **Ekahau Certified Solutions Engineer (ECSE)** training equips your team with that expertise, ensuring your networks meet strict performance, compliance, and security standards.

With ECSE certification, you will learn to:

Design for Complex Environments

Build resilient, high-performance networks across courthouses, city halls, libraries, and outdoor public spaces—even in older or restricted-access buildings.

Ensure Long-Term Network Reliability

Design networks that deliver consistent coverage and performance between major upgrade cycles—which are often five years or longer—while supporting new technologies like Wi-Fi 7.

Maintain Security and Compliance

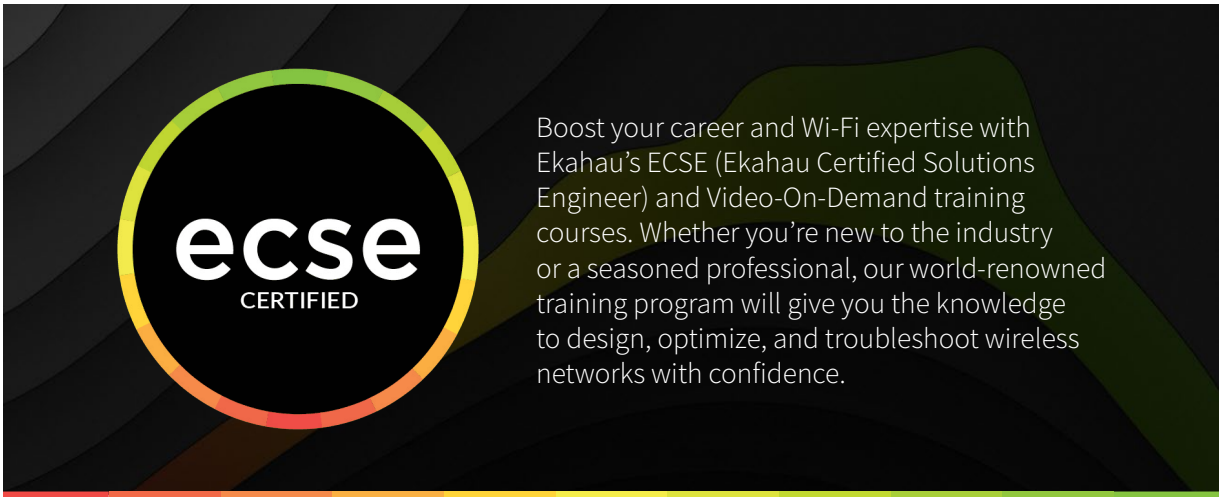
Design, troubleshoot, and validate your network even in highly classified or air-gapped environments with tools that operate fully offline, ensuring sensitive data stays protected.

Support Distributed Teams

Design, troubleshoot, and optimize connectivity across multiple remote offices and facilities, reducing the need for on-site IT expertise.

Don't just get the best tools for the job—become an expert in using them. Elevate your skills, enhance your network's performance, and deliver an exceptional wireless experience for your employees and your constituents.

Learn more about ECSE Certifications and find a course that fits your schedule. >



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New Network Designs for Public Sector

A well-designed network ensures a Wi-Fi signal reaches every corner of your facilities, providing fast and consistent performance, free from interference.

Ekahau's core design software, Ekahau AI Pro, transforms the complex process of Wi-Fi design into a streamlined workflow. Whether you're designing for a courthouse, a library, administrative offices, or even a large park, our precision tools ensure optimal performance from day one.

We offer both cloud-based and fully offline versions of our software, so every government agency can design networks in compliance with their own IT and security requirements.

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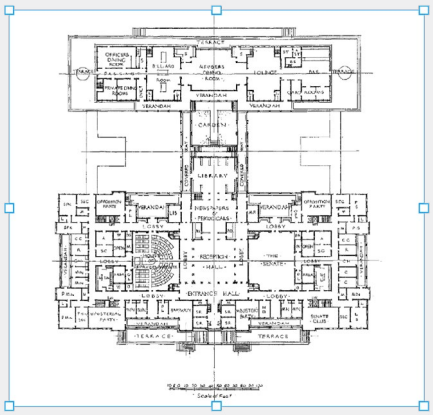

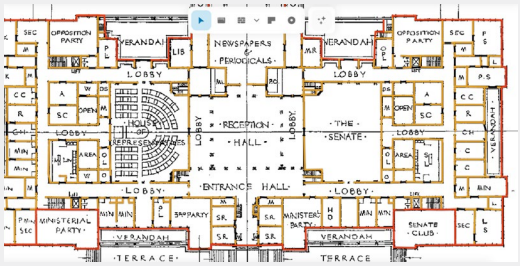

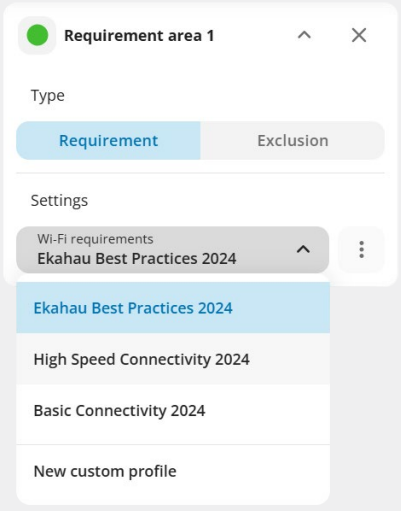

1 Import Your Floor Plan

Begin by importing your floor plan, which can be in JPG, PNG, PDF, or CAD file format. From here, you can adjust your floor plans' angle, opacity, and choose from color or greyscale. Then, set your scale for your project. Setting a proper scale for your floor plan determines how the signal will propagate through your space. For best accuracy, use a clearly defined and easily measurable feature—like the length of a hallway—to set the correct scale.

2 Draw Walls

When planning a Wi-Fi design, drawing walls on your floor plan helps create a more accurate network model by accounting for how different building materials affect signal propagation. Designs that ignore wall structures might look fine on screen but fail in practice, with signal loss and coverage gaps where materials block or weaken transmission. For example, drywall can reduce signal strength by about 3dB, while large concrete pillars may block it entirely.

Ekahau AI Pro Online analyzes floor plan files and automatically draws walls for you, saving time and effort. The software even automatically identifies outer windows in addition to walls and doors, making floor plan preparation faster and more accurate. Whether working with PDFs or bitmap files, the automated detection system quickly identifies architectural elements with improved precision, cutting down the time needed for initial project setup. This means less time manually adjusting wall placements and more time focusing on your network design.

3 Define Connectivity Requirements for Your Space

Defining the right network requirements for each part of your environment is essential for delivering reliable performance. Will the network need to support basic web browsing, or handle high-capacity voice and video traffic? Ekahau makes it easy to define network requirements with built-in industry presets for common connectivity requirements or fully customizable settings for signal strength, capacity, signal-to-noise ratio, data rate, and channel interference.

Our software lets you apply these requirements manually or automatically across different parts of the floor plan. For example, you might set higher capacity requirements in public-facing areas like service counters or conference rooms, and lower requirements in storage areas.

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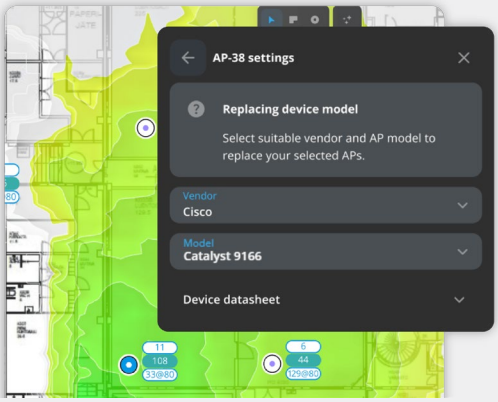
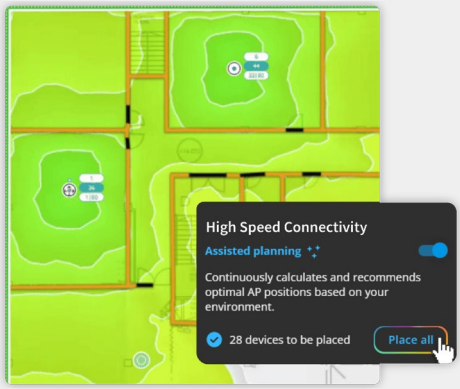


4 Choose Your Access Point Model

Choose from our comprehensive database of over 4,500 enterprise APs and external antennas. We work with every major wireless networking infrastructure company to ensure you can create accurate designs based on actual antenna radiation patterns for each access point.

5 Determine Ideal Access Point Locations

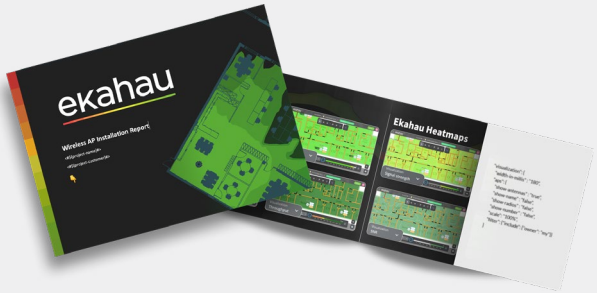
Finding the perfect placement for access points traditionally required extensive RF expertise and time-consuming calculations. Ekahau transforms this process through intelligent automation while still giving you complete control. Based on your floor plan and selected AP models, you can either manually place APs or leverage Ekahau's powerful algorithms to determine ideal locations automatically.



With AI-powered Assisted Planning, you can select from thousands of the most popular access point models and calculate in real-time the optimal positions based on your requirements and configurations. The system intelligently analyzes your environment, accounting for walls, distances, and coverage requirements to recommend precise AP placements that maximize performance while minimizing hardware costs.

For greater control, you can place access points in specific locations where you know you need them, and watch as the assisted planner algorithm dynamically adjusts proposed new AP locations to complement your manual placements.

6 Export Design Report and Bill of Materials



Once your design is complete, comprehensive documentation transforms your plan into an actionable implementation blueprint. Ekahau generates detailed reports and a bill of materials that clearly communicate your network plan to both technical teams and non-technical stakeholders. From there, it's time to install and validate the network to ensure it performs as expected.

The ability to visualize and simulate network performance before any equipment is installed eliminates costly trial-and-error approaches that are typical in Wi-Fi redesigns. You can see exactly how modifications will perform in your unique environment, reducing deployment time, avoiding expensive mistakes, and delivering reliable performance from day one.

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Wi-Fi Data Collection and Network Validation with Ekahau

Even the most carefully designed network requires validation after deployment. While design software can predict wireless coverage, real-world conditions often introduce unexpected variables. Building materials might perform differently than expected, furniture arrangements can affect signal propagation, and unexpected sources of interference might appear.

To account for these variables, collecting real-world Wi-Fi data and validating the network with specialized tools is essential. This is done through a process called a Wi-Fi survey, where you simply walk the environment with a data collection device like the Sidekick 2 to measure how the network actually performs. Failing to conduct a survey can leave critical gaps between predicted and actual performance, often leading to poor user experience and reduced reliability.

Ekahau's integrated approach to data collection and planning capabilities ensures your wireless infrastructure performs as expected and continues to deliver exceptional performance post-deployment and throughout its lifecycle. Measuring what's actually happening in your environment—not just what should be happening according to software predictions—helps you identify and address issues before they impact users.

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The World's Most Accurate Wi-Fi Measurement Device

The Ekahau Sidekick 2 sets the industry standard for Wi-Fi analysis through its precisely engineered, in-house built hardware, precision components, and patented technologies. The Sidekick 2 provides comprehensive visibility into your entire wireless environment, delivering unmatched measurement accuracy and scanning speed.

Faulty measurements lead to costly network design mistakes and troubleshooting headaches—that's why each Sidekick 2 is specially designed with purpose-built parts and is individually calibrated for superior omnidirectional accuracy.

By comparing real-world measurement data against your design predictions, you can quickly identify and address any discrepancies before they affect users.

Integrated Spectrum Analysis: Only with Ekahau

During surveys, the Sidekick 2's patented integrated spectrum analyzer simultaneously detects channel utilization, signal-to-noise ratio, and sources of interference across multiple frequency bands (2.4 GHz, 5 GHz, and 6 GHz).

This capability is critical for identifying performance-degrading issues caused by both neighboring wireless networks and non-Wi-Fi interferers. Devices like Bluetooth peripherals, motion sensors, and microwave ovens can disrupt your network—and unlike many other Wi-Fi measurement tools, the Sidekick 2 detects them all.

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Unique Survey Modes

Collecting Wi-Fi data is remarkably simple with Ekahau's innovative survey modes, offering capabilities you won't find anywhere else:

Just Go Survey

Uses augmented reality to create floor plans automatically as you walk—ideal when no floor plan exists.

Autopilot Mode

Automatically tracks your location on an uploaded floor plan during a survey, making walkthroughs fast and accurate.

GPS Survey

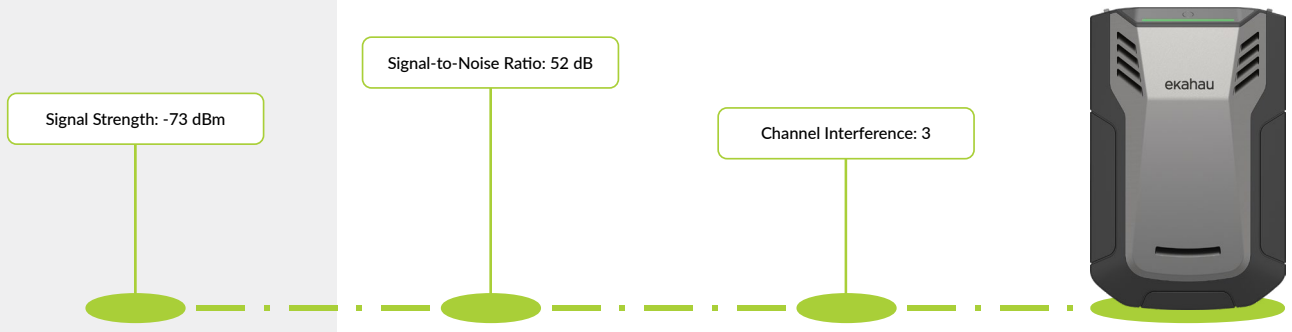
Integrates with Apple Maps and your iPhone's GPS to perform large-scale outdoor surveys—ideal for large open spaces, public venues, or government facilities with wide coverage areas.

Stop & Go and Continuous Modes

Classic options for more controlled data collection—either by pausing at specific points or walking continuously while tapping to mark changes in direction or speed.

Our survey modes instantly locate APs, place them precisely on your floor plan, and generate heatmap visualizations. This makes professional-grade Wi-Fi surveying accessible to anyone without requiring special expertise.

Stop & Go	Continuous	Autopilot	Just Go	GPS
Stop, collect, move, and repeat. Collects the least amount of data.	Tap when you start, when you turn, when you change pace and when you stop.	Calibrate your position on the floor plan, and then walk. Survey app understands where you are on your floor plan.	Just go, no floor plan needed! Uses LiDAR and Apple ARKit to scan environment as you walk.	Works best for outdoor surveys, requires a GPS-equipped mobile device with a SIM card.



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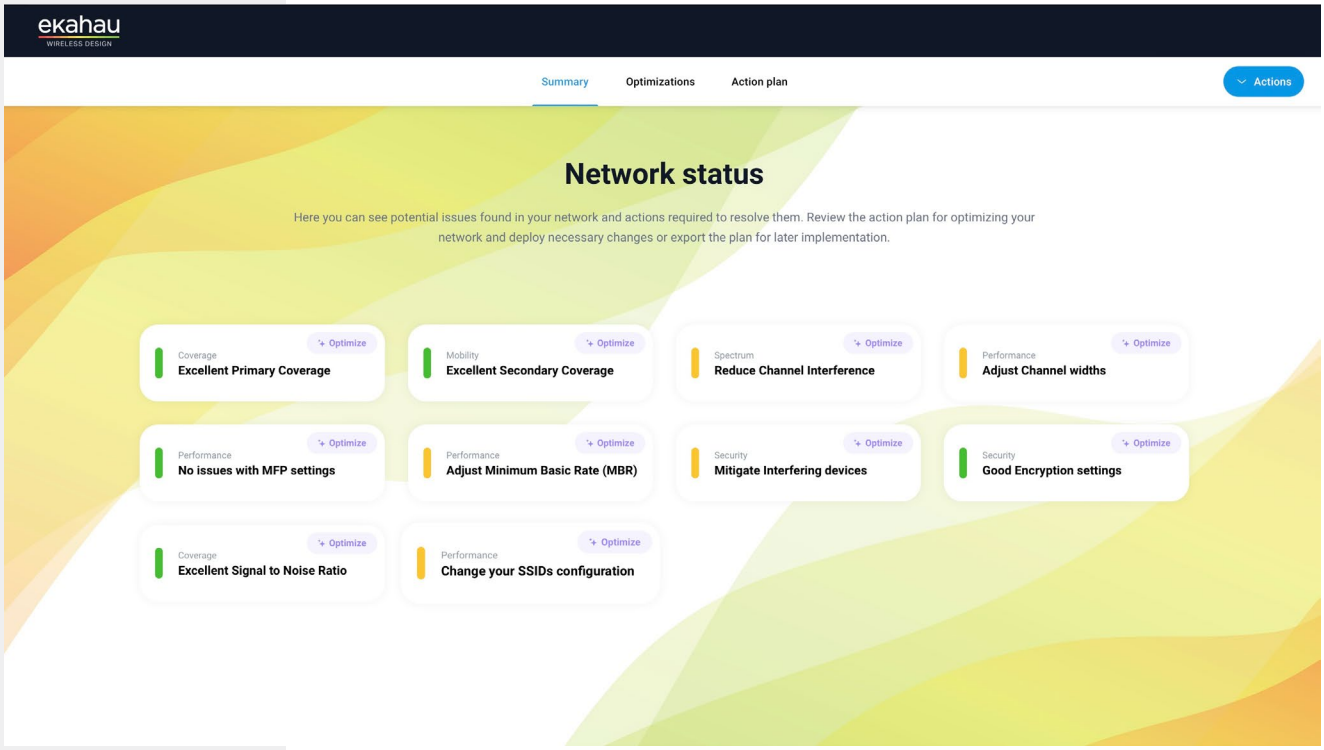

Optimization and Troubleshooting

Once a Wi-Fi network is deployed, effective and efficient troubleshooting are crucial for maintaining peak performance and providing a consistently reliable experience for users. Proactively addressing issues and fine-tuning the network prevents minor glitches from escalating into widespread disruptions that could affect daily business operations and customer experience.

Ekahau offers a comprehensive suite of tools designed to simplify ongoing troubleshooting and optimization, ensuring your network remains robust and responsive, even in the most demanding hospitality environments.

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Continuous Optimization for Peak Performance

When IT teams learn of poor Wi-Fi performance, a common reaction is to add more access points. But without understanding the root cause, that can make things worse, potentially introducing new problems like channel interference. Ekahau offers a data-driven way to optimize performance and fix issues without overspending on unnecessary hardware.

The process starts by capturing the reality of your RF environment. A simple walk-through with the Ekahau Sidekick 2 collects comprehensive and precise data on your network's current performance. The Sidekick 2's integrated spectrum analyzer is crucial for this process, as it accurately measures the signal-to-noise ratio (SNR) and detects non-Wi-Fi interference from devices like microwave ovens or motion sensors that can disrupt your network.

Once your survey data is collected, Ekahau Optimizer analyzes it and translates the complex RF data into simple, actionable recommendations.

Optimizer pinpoints issues such as:

Coverage Gaps

Areas with insufficient primary or secondary signal strength for reliable connectivity and smooth roaming.

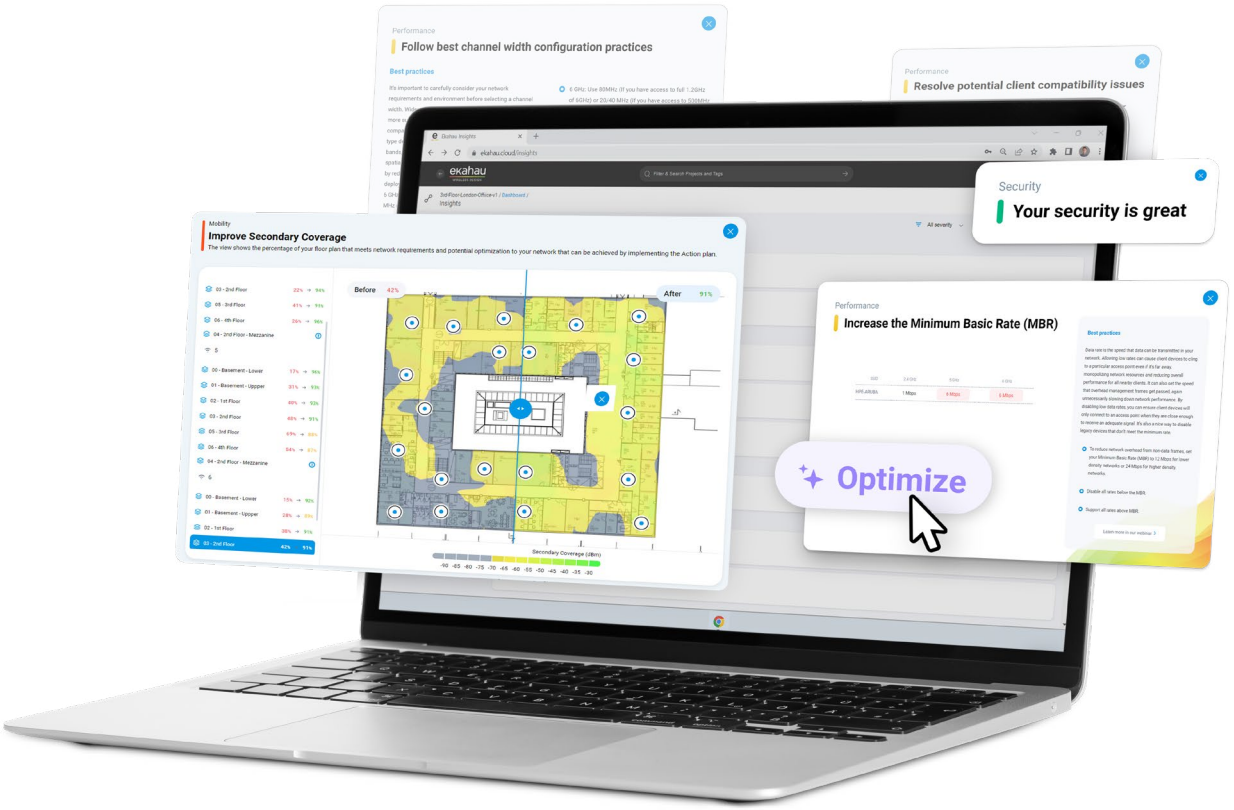
Channel Interference

Overlapping channels from your own or neighboring networks that degrade performance.

Misconfigured Settings

Suboptimal channel widths, SSIDs, or minimum basic rates that slow down the entire network.

Optimizer delivers a step-by-step action plan—personalized for each access point—that you can implement directly in your network controller. Proactive optimization improves the user experience, reduces troubleshooting time, and extends the life of your current network to maximize your return on investment.



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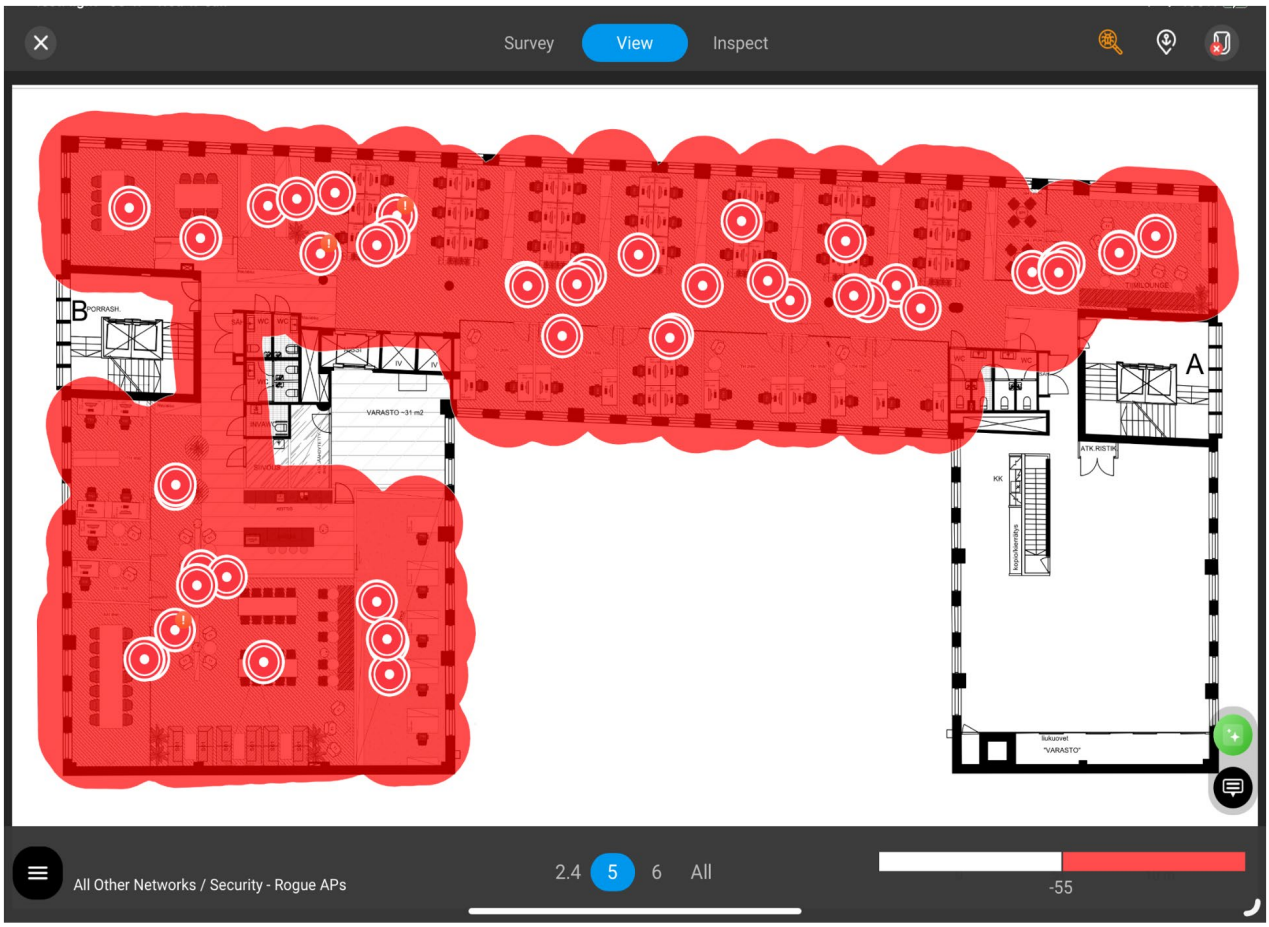

Securing Your Network Against Wireless Threats

While performance matters, Wi-Fi security is even more critical. A single breach can be devastating, and vulnerabilities can come from unexpected places, like Wi-Fi-enabled thermometers or printers.

Maintaining a secure wireless environment requires constant vigilance, but Ekahau makes it simple to identify and eliminate risks. A quick security survey with the Ekahau Sidekick 2 is all it takes to uncover major vulnerabilities across your network.

The Sidekick 2 and Ekahau software work together to pinpoint critical threats, including:

- **Rogue APs:** Unauthorized APs connected to your wired network that provide an easy entry point for hackers.
- **Weak Encryption:** The use of outdated and crackable security standards like WEP, WPA, or open networks that can expose sensitive company and user data.
- **Missing Management Frame Protection (MFP):** The absence of MFP leaves your network vulnerable to spoofing attacks, where an attacker can kick users off your Wi-Fi network and trick them into connecting to a malicious network.

After a site survey, Ekahau Optimizer instantly provides a comprehensive security report you can use to fortify your network's defenses. Performing regular security checkups with Ekahau helps you validate your configurations and keep your data, users, and network safe from evolving threats.

A high-performing network is also a more secure one. When official hotel Wi-Fi is fast and reliable, guests are far less likely to create vulnerabilities by turning to personal hotspots or unauthorized routers—a practice known as “Shadow IT.”

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Advanced Troubleshooting

Effective troubleshooting provides immense value by enabling teams to quickly identify, diagnose, and resolve underlying issues to ensure dependable and uninterrupted connectivity. The Ekahau Analyzer app, optimized for use with Ekahau Sidekick 2, provides a suite of professional-grade features on Android and iOS to identify the root cause of Wi-Fi issues and resolve them fast.

When users report slow connectivity, the first step is determining if the problem stems from the Internet Service Provider (ISP), the local Wi-Fi network, or the client device itself. The Analyzer app provides advanced tools to pinpoint the source of Wi-Fi-related problems across all three bands (2.4/5/6 GHz).

Analyzer is also integrated with Speedtest® by Ookla®, allowing IT professionals to measure internet speeds while simultaneously analyzing the live Wi-Fi spectrum for interference or congestion. This provides clear visibility into whether the issue originates with the ISP or the local network—critical for identifying true bottlenecks in government environments (or anywhere else).



For a deeper look at the RF environment, the Analzyer app leverages the Sidekick 2's high-resolution spectrum analyzer, which displays RF interference in real-time with 50 sweeps per second to catch even quick, intermittent events. The network overview feature further assists in root cause analysis by validating your network against predefined requirements and providing clear pass/fail indications for critical configurations like security settings, roaming amendments, and minimum basic rates.

For advanced troubleshooting, Ekahau's Client Analysis Tool revolutionizes how client-specific issues are diagnosed. Instead of immediately resorting to time-consuming packet capture, IT professionals can simply bring a user's device close to the Sidekick 2 for a rapid assessment of its connection health. The tool presents key performance indicators with an intuitive green-yellow-red color-coding system, empowering users of all technical levels to quickly understand if the issue lies with the network or the client device.

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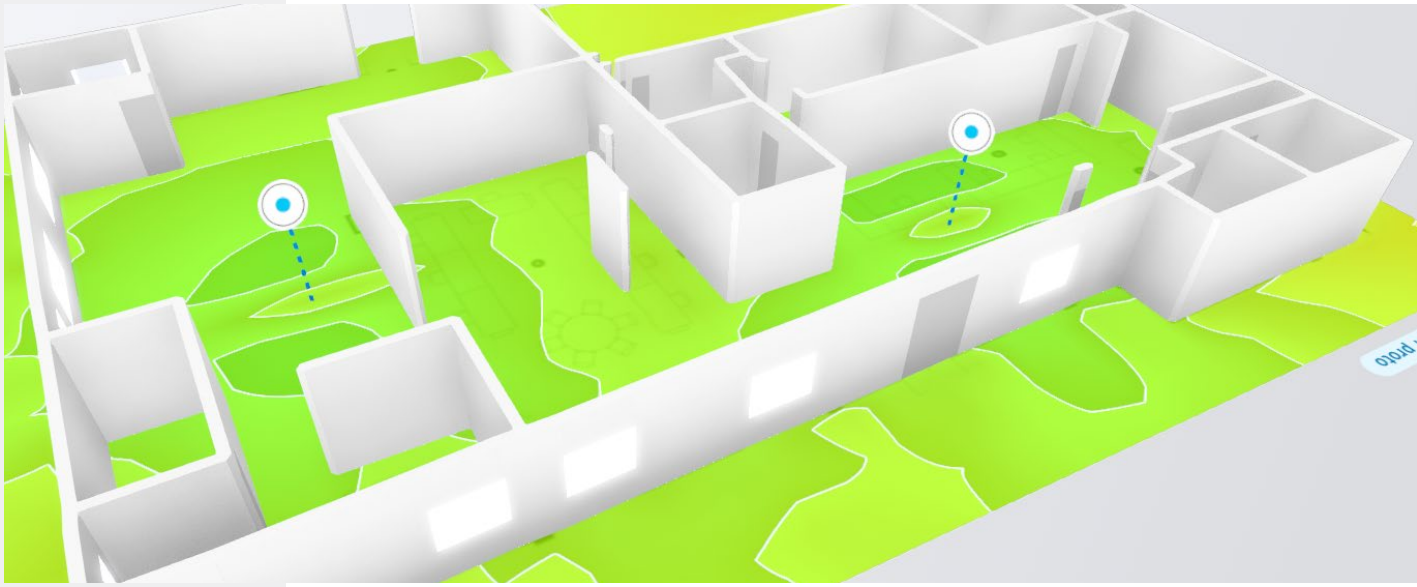

Network Redesigns for Government Wi-Fi

Nearly 80% of all network design projects are actually redesigns. In the public sector, Wi-Fi networks are constantly being reworked to replace aging infrastructure with newer technology that delivers faster speeds, lower latency, and stronger security—all critical needs in today's government operations. With a typical network lifespan of five to ten years, public sector deployments require regular upgrades to keep pace with changing demands:

- Rapid changes in Wi-Fi standards (such as the jump from Wi-Fi 6 to Wi-Fi 7).
- Increased demand from bandwidth-intensive use cases, such as real-time video monitoring, transferring large data sets between agencies, or delivering digital public services.
- Wear and tear on equipment in high-traffic government environments.
- End-of-life (EOL) support from hardware vendors.

In the past, planning for these upgrades meant a lot of guesswork—estimating coverage needs, manually modeling buildings, and hoping for the best. That often led to performance gaps or budget surprises, but it doesn't have to be that way anymore. Ekahau eliminates the uncertainty, making it easy to plan and execute government Wi-Fi redesigns with confidence and accuracy.

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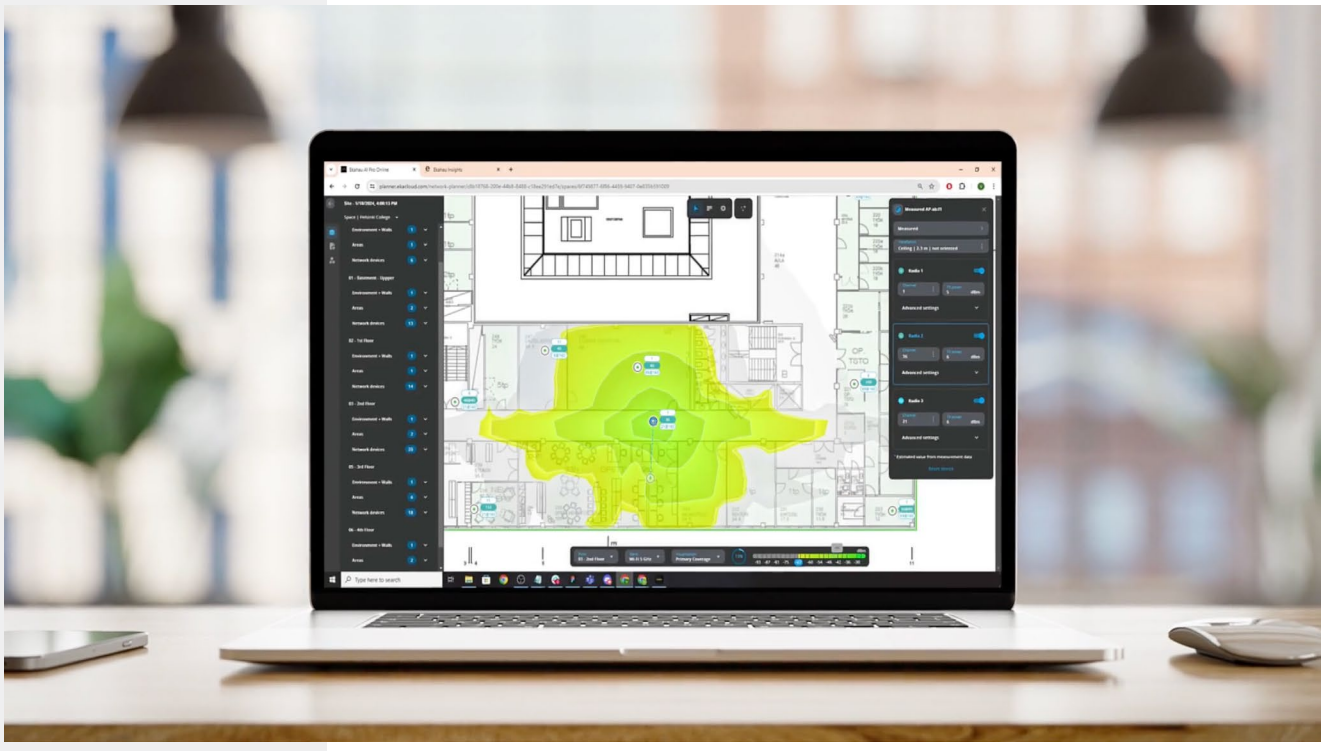
Simulate Your RF Environment

The first step in any redesign is understanding how your current Wi-Fi environment actually performs. With Ekahau, that starts by walking the site with a Sidekick 2 paired with an Android or iOS device to capture accurate survey data—no guesswork, no manual wall drawing.

That real-world data feeds into Ekahau AI Pro Online, which automatically builds a detailed RF model of your space. You'll get a precise view of how signals behave in your buildings, accounting for building materials, obstructions, and other factors that might not be visible on a floor plan.

These tools replace the old, error-prone method of manually sketching out walls and guessing at how materials affect signal strength. Without accurate data, it's easy to overlook hidden barriers—like concrete behind drywall or wall-to-wall bookshelves—that quietly degrade performance. With Ekahau's solutions, you can catch these issues early and make informed design decisions before a single access point is deployed.



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Visualize Public Sector Network Upgrades Before You Deploy

Once you've built a reliable model of your current public sector environment, redesigning your network becomes much more efficient. With Ekahau AI Pro Online, you can select your existing access points (APs) on the floor plan and instantly simulate an upgrade by swapping in newer models from a library of over 4,500 options.

This "rip-and-place" feature lets you see exactly how different APs would perform in their current locations—whether they're mounted in government offices, courtrooms, libraries, or public service facilities—before touching a single ceiling tile. If you need to adjust placements or add more APs to support higher device density or growing digital services, you can drag and drop them on the floor plan and watch the heatmaps update in real time.

Ekahau's powerful simulation capabilities allow you to test, validate, and fine-tune your design by modeling the most common upgrade scenarios, such as:

- **Upgrading to newer APs:** Simulate performance improvements with Wi-Fi 6E or Wi-Fi 7 in high-traffic areas like public lobbies or service counters.
- **Expanding coverage:** Add APs to eliminate dead zones in large auditoriums, meeting spaces, or outdoor areas.
- **Switching vendors:** Compare performance across vendors to ensure consistent connectivity throughout your facilities.

Testing upgrades in advance helps you speed up deployment, avoid costly mistakes, and deliver strong, reliable Wi-Fi across every corner of your network.



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Conclusion

Successfully managing Wi-Fi networks in the public sector requires tools and strategies that account for the sector's unique architectural complexities, stringent security needs, and demanding budgetary realities. While the challenges are significant, they are not insurmountable.

The key to providing consistently successful Wi-Fi lies in approaching these intricate hurdles systematically. By leveraging tools designed specifically for these demanding environments, IT teams can ensure reliable, secure, and cost-effective connectivity across their entire infrastructure.

Whether you're working in a historic building, supporting a large outdoor event, or managing a distributed network of remote sites, Ekahau's wireless design and validation tools make it simple to deliver the reliable connectivity modern government services depend on.

To see how Ekahau products can help Wi-Fi on your public sector sites, reach out for a demo.

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