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Private Network Playbook: Wi-Fi, 5G, and CBRS — When to Use What

By RAN Wireless

SUMMARY

In today's enterprise landscape, the question isn't whether you need wireless — it's which type will best support your operations.

Wi-Fi 6/7, Private 5G, and CBRS each offer unique advantages. But knowing when to use what — or how to combine them — is where true strategic value lies.

This eBook serves as your playbook. Whether you're an IT director evaluating future infrastructure or a systems integrator designing multi-site networks, you'll find practical, expert-backed advice to help you choose the right wireless path for your business.

Meet the Technologies — A Quick Primer

Wi-Fi 6/6E/7:

- Unlicensed spectrum
- Fast deployment and low cost
- Ideal for high-density indoor spaces (offices, classrooms, arenas)

Private 5G:

- Licensed or shared spectrum (e.g., CBRS)
- Ultra-reliable, low latency, wide-area coverage
- Built for automation, mobile robotics, mission-critical environments

CBRS:

- Mid-band spectrum (3.5 GHz) open for enterprise use in the U.S.
- Enables private LTE/5G networks without carrier dependency
- A cost-effective path to private mobility

When to Use Wi-Fi, Private 5G, or CBRS

Choose Wi-Fi when:

- You need fast, cost-effective indoor coverage
- Mobility is limited to local zones (offices, conference rooms)
- Devices don’t need ultra-low latency

Choose Private 5G when:

- You require device mobility across large or dynamic areas
- Reliability and determinism are key (robotics, AGVs, telehealth)
- Interference in unlicensed spectrum is a recurring issue

Choose CBRS when:

- You want the benefits of 5G without the cost of licensed spectrum
- You operate in the U.S. and want local control without carriers
- You’re layering cellular-grade reliability on top of existing Wi-Fi

Use Case Snapshots

Smart Campus:

- Wi-Fi 6 for student/staff devices and guest access
- CBRS for facilities/maintenance mobile tools and secure communications

Logistics Warehouse:

- Private 5G for AGV fleets, barcode scanners, and real-time WMS
- Wi-Fi 6 for staff BYOD and tablets
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Hospital Network:

- Wi-Fi 6 for admin areas and general patient access
- Private 5G for telemetry, diagnostics, and mobile carts
- DAS/CBRS for emergency comms and public safety compliance

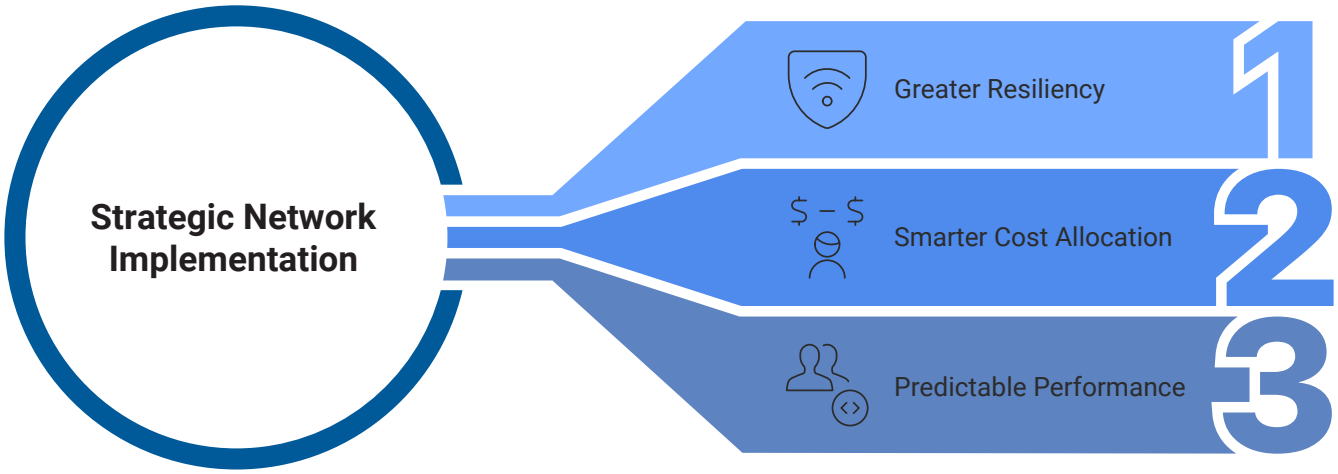
Comparing Cost, Complexity, and Control

Characteristic	Wi-Fi 6/7	Private 5G	CBRS LTE/5G
Spectrum	Unlicensed	Licensed/shared	Shared (US)
Cost	Low (CapEx + OpEx)	Medium-High	Medium
Coverage Area	Small-Medium	Large	Medium-Large
Latency	20–50ms	10ms	10–20ms
Reliability	Moderate	Very High	High
Mobility	Limited	Excellent	Excellent
Device Density	High	Very High	High
Ownership	Enterprise-owned	Enterprise-owned	Enterprise-owned

Why Hybrid Networks Win

In reality, most enterprise environments benefit from **a combination** of wireless technologies. By aligning each network layer with the right use case, organizations achieve:

- Greater resiliency
- Smarter cost allocation
- More predictable user and device performance



A hybrid network isn't a compromise — it's a tailored approach that gives you the best of every technology.

The RAN Wireless Framework for Choosing the Right Mix

We help clients evaluate and build wireless ecosystems based on 4 key pillars:

1. Use Case Criticality:

What applications need guaranteed performance?

2. Mobility Requirements:

Are devices moving within zones or across sites?

3. Environmental Constraints:

How harsh, dynamic, or interference-prone is the space?

4. Growth Forecast:

What needs to scale in 12–36 months?

This framework ensures technology selection aligns with business outcomes, not vendor hype.

Final Thoughts

The future of wireless isn't one-size-fits-all. It's smart, layered, and built around your needs.

At RAN Wireless, we help organizations build wireless systems that aren't just functional — they're future-ready, cost-effective, and strategically aligned.

Wi-Fi, 5G, CBRS — we speak them all. Let's build your wireless strategy the right way: by design.

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