

WHITE PAPER

Solving In-building Cellular Connectivity With Emerging Neutral Host Networks

Contents

Executive Summary -----	03
Introduction -----	04
Why Business Leaders Are Rethinking Their In-building	
Cellular Connectivity Strategy -----	07
Poor indoor cellular connectivity has big business implications-----	07
Ensuring occupant safety is of critical importance-----	08
Wi-Fi is no longer a sufficient stop-gap solution-----	09
Public cellular connectivity indoors could become worse with 5G-----	10
The business dynamics are changing with telecom operators-----	11
Emerging Choices Support Enterprise Indoor Connectivity Goals -----	13
Shared spectrum-based neutral host solutions make every sized building get better connectivity-----	13
Beyond voice – leveraging the NHN infrastructure to build new use cases that will thrive on private cellular networks-----	16
Key Considerations to Make the Right Choices -----	18
Choosing the right technology-----	18
Choosing the right neutral host provider-----	20
Conclusion -----	23



Executive Summary

In today's always-need-to-be-connected world, achieving reliable indoor cellular connectivity has become mission-critical for enterprises across industries and buildings of all sizes. However, modern building materials severely attenuate public mobile network signals, leading to dropped calls, sluggish data speeds, and frustrated employees and customers. Dropped voice calls have a major impact on business operations today. Most surveyed workers stated they can experience dropped calls almost daily. And one-third cited lost opportunities or missed business decisions from poor cellphone connectivity.¹

Enterprises typically use solutions like signal boosters, Wi-Fi, indoor small cells, and distributed antenna systems (DAS), which have been too costly and complex for all but the largest venues to solve multi-operator indoor coverage challenges. The reality is most buildings fall in the small to medium range without viable solutions – until now.

Neutral host networks (NHNs), a business model where a neutral entity, a “Neutral Host Provider,” installs infrastructure shared by multiple network operators, have existed for a while to solve the multi-operator in-building cellular coverage problem. However, it was restricted to technology choices like DAS, operator-specific small cells, and multi-operator small cells – all requiring navigation

and orchestration of cumbersome issues like spectrum ownership, cost responsibilities, and revenue distribution.

The introduction of shared spectrum technologies like Citizens Broadband Radio Service (CBRS) has simplified robust multi-operator indoor cellular connectivity in the US. CBRS-based neutral host networks leverage shared radio infrastructure and shared spectrum models to provide a scalable, multi-operator solution at a fraction of the cost of traditional approaches.

Moreover, the rise of neutral-host-as-a-service models further reduces barriers by delivering NHN capabilities through flexible operating expense models, eliminating substantial upfront capital investments.

As enterprises strive for digital transformation, supplementing public cellular coverage with private cellular networks over the same NHN infrastructure unlocks robust new use cases like IoT, smart manufacturing, and mission-critical applications.

By deploying the right NHN strategy, enterprises can ensure reliable indoor mobile service, drive operational efficiencies, elevate customer experiences, and future-proof their connectivity infrastructure – gaining a sustainable competitive advantage in an increasingly connected world.

Neutral host networks involve shared wireless infrastructure that allows multiple entities, such as mobile network operators and enterprises, to utilize a common set of equipment and resources, enabling more efficient and cost-effective network deployment and operation.

¹ *The Cell Phone Habits of the Typical American at the Workplace*

Introduction

With the long-standing statistic that a staggering 80% of all mobile calls occur indoors, the importance of reliable in-building cellular coverage cannot be overstated. However, until recently, there have not been effective indoor cellular connectivity solutions for all building sizes.

The sheer scale of the indoor connectivity requirement is stunning. In the United States alone, there are over 133,000 buildings with floor space between 100,000 and 500,000 square feet, representing prime candidates for better indoor public cellular connectivity, including:



Regardless of site dimensions, poor indoor cellular performance can lead to dropped calls, sluggish data speeds, and frustrated employees and customers alike, ultimately hampering productivity, customer satisfaction, and overall business operations. The demand for robust in-building cellular connectivity is only set to grow, with 87% of companies expecting employees to use their cell phones for work and 51% requiring employees to use company-mandated apps on their phones.²

As enterprises grapple with the challenges of providing ubiquitous cellular connectivity within their facilities, new approaches to neutral host cellular networks are a powerful solution, offering flexible and cost-effective options to address multi-operator in-building cellular coverage and capacity needs.

The potential for neutral host networks holds much promise, and many building owners and venue owners are deploying them. Per a November 2023 Research and Markets report, the global neutral hosting market is expected to rise to \$8.7 billion by 2028. North America will be the leader in NHN deployments, followed by Asia Pacific and Europe.

² 25 Trending Cell Phones in the Workplace Statistics

Advantages for enterprises and building owners to deploy neutral host networks

Advantage	Description
 Improved Cellular Coverage	Provides better cellular coverage throughout the building, ensuring reliable connectivity for tenants, visitors, and employees.
 Cost Savings	Instead of each MNO installing its own equipment, a neutral host network reduces the overall cost of deployment and maintenance.
 Future-Proof Infrastructure	Designed to accommodate multiple carriers and technologies, allowing for easy upgrades and adaptations as new technologies emerge.
 Simplified Management	Enterprises and building owners only need to manage and maintain a single infrastructure, simplifying the overall process and reducing complexity.
 Competitive Advantage	Buildings with a neutral host network offer better cellular connectivity, which can be a significant competitive advantage when attracting and retaining tenants and customers.
 Increase Property Value	Elevate property value with assured high-performing indoor wireless connectivity.
 Increased Satisfaction	Tenants, visitors, and employees benefit from seamless connectivity, high data speeds, and reliable voice calls. Property owners who invest in NHNs can also attract businesses seeking reliable connectivity.

Nobu Hotel At Caesars Palace

The Nobu Hotel at Caesars Palace, a premier 180-room luxury hotel within the massive Caesars Palace entertainment complex in Las Vegas, was facing connectivity challenges in the early 2020s.

The hotel's early 2010 infrastructures struggled to keep up with increasing demands for in-room Wi-Fi and mobile connectivity for staff operations, which were worsened by a 2013 remodel with energy-efficient glass and high-end suites.

Higher frequency 4G/5G signals could not penetrate indoors, making Nobu a "hotel connectivity desert."

Caesars Entertainment deployed a CBRS private wireless solution to upgrade Wi-Fi and enable wireless staff operations without costly and disruptive re-wiring. The new network provided a wireless fronthaul to new Wi-Fi access points installed room-by-room from the hallways during routine housekeeping. The private OnGo network, utilizing 100MHz of CBRS spectrum, also served as a secure platform for modernizing housekeeping, facilities, and guest services via mobile devices and applications.

Recognizing OnGo's ability to economically solve indoor cellular coverage gaps, Caesars leveraged a multi-operator core network to add AT&T and T-Mobile commercial services to the existing private wireless deployment. With minimal infrastructure additions, the neutral host system meets all regulatory, security, and operational requirements while delivering full commercial voice/data services from multiple carriers over shared CBRS spectrum and infrastructure.



Why Business Leaders Are Rethinking Their In-building Cellular Connectivity Strategy

The ever-evolving landscape of business demands a comprehensive approach to in-building cellular connectivity, and forward-thinking leaders are prioritizing solutions that deliver robust indoor mobile coverage. The costs of entrenched legacy solutions and patchwork approaches simply won't suffice in meeting the dynamic needs of today's workforce and customer base. A strategic investment in an in-building cellular infrastructure is not just about staying competitive - it's about unlocking the full potential of a mobile-driven world.

Poor indoor cellular connectivity has big business implications

Despite advancements in mobile networks, achieving reliable cell service inside buildings remains a significant hurdle. The very materials that make modern structures strong, efficient, and secure – concrete, steel, and advanced insulation – cripple radio signals. Designed for broad outdoor coverage, public mobile networks struggle to penetrate these materials.

For today's businesses, reliable cellular coverage inside buildings is no longer optional – it's the foundation for a successful operation. It fuels productivity and collaboration, fosters seamless customer experiences, and plays a crucial role in public safety.

Employees stuck with weak signal strength become frustrated and less productive. Customers struggle to interact and may abandon transactions due to connectivity issues. Security measures and compliance efforts can be compromised without consistent cellular access. Ultimately, these factors hit the bottom line hard.

In one survey, over 30% of those polled said they had lost a deal or client or missed a key business decision or sales because of poor cellular connectivity.

Illuminati Labs



Ensuring occupant safety is of critical importance

Reliable cellular coverage within buildings has emerged as a crucial factor in ensuring occupant safety and effective emergency response. In critical situations, the ability to promptly establish communication can be instrumental in reducing risks and providing timely assistance. Inadequate or inconsistent cellular signals inside buildings can severely hamper emergency communications (80%³ of emergency 911 calls are made from mobile phones), leaving occupants vulnerable and impeding the efforts of first responders. Moreover, as building automation systems and safety mechanisms increasingly rely on cellular connectivity, sufficient in-building coverage becomes a prerequisite for proper functioning.

Furthermore, robust cellular connectivity inside buildings contributes significantly to overall safety by enabling seamless communication and access to vital information. In the event of a fire or other

emergency, reliable coverage ensures that evacuation instructions and critical updates can be disseminated efficiently to all occupants. In addition to reliable coverage, locating individuals within a building is crucial for emergency response. At least one company has recently announced advanced technologies that leverage cellular networks to provide accurate indoor positioning, enabling first responders to locate and assist those in need during emergencies quickly.

“
A survey of the International Association of Fire Chiefs reports that in a large percentage of buildings, critical communication [e.g. emergency calls out] can't happen.**”**

Illuminati Labs

³In-Building Forum | Wireless Infrastructure Association

Wi-Fi is no longer a sufficient stop-gap solution

For many years, organizations have used Wi-Fi as a bridge solution to address indoor connectivity limitations. Likewise, operators use public Wi-Fi or neutral host Wi-Fi infrastructure to offload cellular data traffic and support native Wi-Fi calling (an approach using a Wi-Fi network to make and receive cellular calls). However, this approach has become increasingly unsustainable in today's mobile-first environment. Several key factors contribute to the diminishing efficacy of Wi-Fi as a stop-gap measure for in-building cellular connectivity.



Congested Wi-Fi networks due to high guest traffic can significantly disrupt business operations. As a growing number of devices compete for limited bandwidth, critical business applications and services may experience performance degradation, potentially impacting productivity and jeopardizing mission-critical processes.



While Wi-Fi has served as a temporary solution for indoor data access, it may not be the optimal choice, especially for guests in public venues. Perceived security risks associated with unknown networks, complex login procedures, and subpar voice call quality can hinder the delivery of a seamless and consistent user experience.



The proliferation of unlimited voice and data plans with mobile hotspot functionality has diminished user dependence on readily available Wi-Fi networks. In the past, guests at hotels, conferences, or other venues often switched to Wi-Fi to save on data costs. However, with most cellular plans now offering unlimited data, users are less incentivized to connect to Wi-Fi as a cost-saving measure when cellular reception is available.

Considering these limitations, business leaders acknowledge the need to transition beyond Wi-Fi as a temporary solution. A more comprehensive and future-proof approach is required to effectively address the challenges of in-building cellular connectivity.



Meta, formerly known as Facebook, has implemented a Neutral Host in-building wireless network using CBRS small cells across many of its office buildings. By leveraging the CBRS spectrum, Meta achieved rapid coverage expansion at a reduced cost, finding the CBRS solution to be 70% faster to deploy and more affordable than DAS.

Public cellular connectivity indoors could become worse with 5G

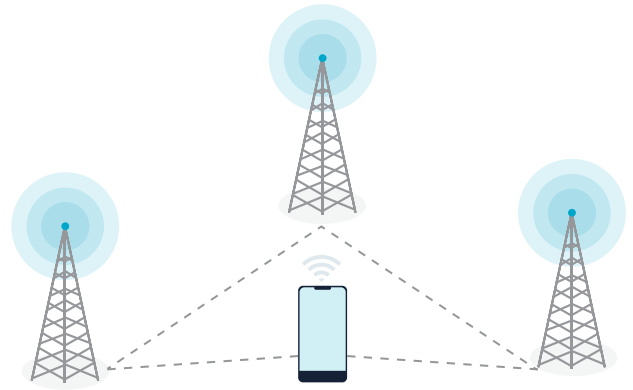
The arrival of 5G promises a revolution in wireless communication, but ensuring seamless indoor coverage for this next-generation technology presents a unique set of challenges for enterprises.

5G often uses mid-band and millimeter wave spectrums, offering exceptional data/device capacity but struggling with signal penetration. This is further compounded by modern energy-efficient building materials, potentially leading to “dead zones” and compromised indoor coverage compared to previous generations of cellular technology.

The proliferation of connected devices fostered by 5G and the Internet of Things (IoT) will further strain network capacity. As more devices compete for limited indoor resources, congestion could arise, potentially impacting the performance of critical business applications and services.

“ Global mobile data traffic consumption per smartphone is expected to reach 56 GB per month at the end of 2029.”

Ericsson Mobility Report



< 40% of indoor wireless data is handled by outdoor cellular base stations

Ericsson Mobility Report

The essence of 5G – enabling innovative applications – hinges on robust indoor coverage. Industries like smart manufacturing, intelligent transportation, and remote healthcare will depend on reliable, high-performance indoor 5G connectivity for their success. This necessitates proactive measures to address these challenges and ensure that the benefits of 5G can be fully realized within buildings.

The business dynamics are changing with telecom operators

The growing need for robust in-building cellular connectivity is colliding with a changing telecommunications landscape. Traditional models of relying solely on telecom operators for solutions are becoming increasingly unreliable.

Historically, mobile network operators (MNOs) funded and deployed in-building neutral host infrastructure like DAS systems and small cells to boost customer coverage and capacity. However, this model is under strain. MNOs face pressure to optimize spending, prioritizing investments in broader network coverage and technology upgrades. Carriers struggle to justify significant investments in individual buildings, especially as network densification and site acquisition become more expensive and complex.

Consequently, MNOs are becoming highly selective, favoring only high-traffic locations or large venues where the return on investment is substantial. This leaves a significant gap: most enterprises, from offices and hospitals to residential complexes and industrial sites, lack a clear path to address their indoor connectivity needs using traditional carrier-funded models.

Furthermore, the rise of 5G and the Internet of Things (IoT) further complicates the dynamics. Enterprises exploring these technologies for digital transformation may find their priorities clash with those of MNOs focused on maximizing public network returns.



California Polytechnic State University



California Polytechnic State University San Luis Obispo expanded its private wireless network and added new neutral host capabilities, allowing it to support T-Mobile customers. The network uses the CBRS band to enhance connectivity and safety for the campus community. It also opens opportunities for academic innovation in critical industries such as construction, agriculture, and energy.

The first deployments of this CBRS neutral host solution at Cal Poly are outdoors in remote hiking areas and inside the new William and Linda Frost Center for Research and Innovation. Reliable access to 911 emergency services on any and all campus properties was the priority.

The new wireless network combines technologies for cutting-edge wireless capabilities and research projects. This network simultaneously provides private connectivity services for the university and connectivity for T-Mobile subscribers.

The public-private converged network enables various advanced wireless use cases, including enhanced connectivity and safety across campus. T-Mobile service can be accessed using the 4G neutral host over CBRS, ensuring students have mobile connectivity even in challenging areas. Cal Poly's private wireless network also supports high-speed, ultra-low-latency 5G connectivity for innovative next-generation use cases such as 3D image capture and augmented reality in site construction projects.



Emerging Choices Support Enterprise Indoor Connectivity Goals

Deploying known technologies such as DAS or multi-operator small cells is challenging for building owners, venue owners, and neutral host providers due to the complexities of accessing and managing wireless spectrum use among multiple operators. However, this dynamic has fundamentally shifted with the rise in shared spectrum-based neutral host cellular networks and their various permutations and capabilities.

Shared spectrum-based neutral host solutions make every sized building get better connectivity

The emergence of CBRS has paved the way for neutral host networks to simplify access to high-performance indoor cellular connectivity. By leveraging shared infrastructure and shared spectrum models, CBRS-based neutral host solutions offer a cost-effective and scalable approach to addressing indoor coverage and capacity needs, making them accessible to enterprises of all sizes and across various industries.

The CBRS-based model is rapidly gaining traction, with major carriers like AT&T and T-Mobile supporting CBRS-neutral host deployments. Enterprise adoption is gaining momentum, with sectors like education, smart cities, hospitality, and manufacturing recognizing the value proposition of neutral host CBRS networks for enhanced mobile connectivity.

CBRS is a shared spectrum system in the 3.5 GHz band that enables the deployment of neutral host networks as well as private LTE/5G networks. It operates on spectrum that has been opened up for commercial use leveraging spectrum sharing technologies to allow multiple users to access the same spectrum without interfering with each other. This spectrum sharing approach makes CBRS an attractive option for enterprises, neutral host providers, and mobile network operators to deploy private LTE/5G networks or enhance existing cellular coverage indoors and in other locations where traditional licensed spectrum may be limited or cost-prohibitive



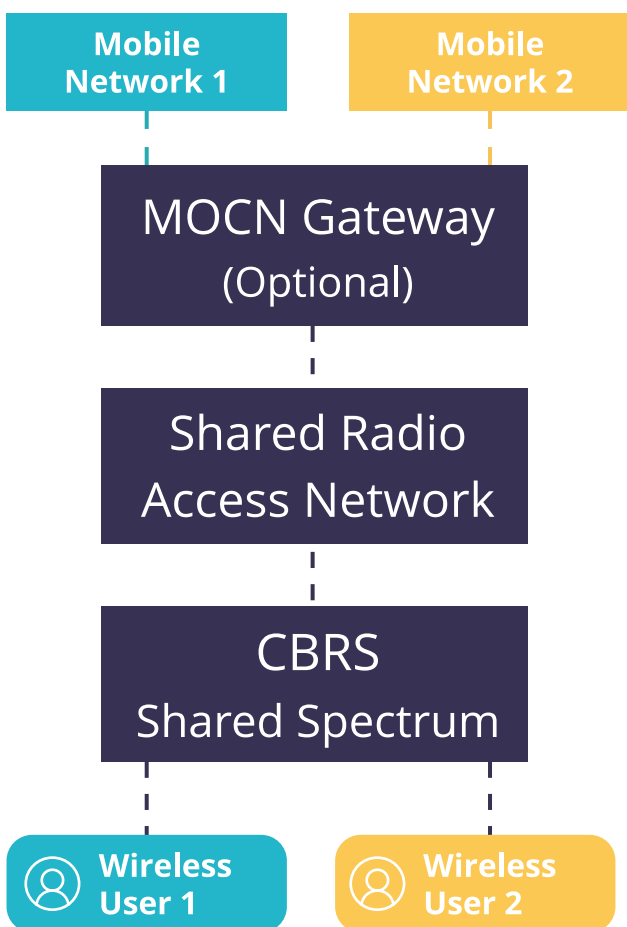
“Modern Neutral Host Networks give enterprises a unique advantage by providing both a private 5G network for business operations and an enhanced public 5G network for staff and guests, all with the same network infrastructure.”

Mehmet Yavuz,
CTO and co-founder, Celona

Multi-Operator Core Network (MOCN) is the most prevalent architecture for neutral host CBRS deployments. In this approach, mobile operators share the same radio access network (RAN) infrastructure, which is then connected back to each operator within their respective core networks to provide voice and data services to their subscribers. This means one radio will connect cell phones to multiple carriers' networks instead of requiring separate antennae for each carrier (like active DAS or other NHN solutions). This saves quite a bit of wiring infrastructure and hardware costs, to say nothing of concerns about signal interference with multiple antennae.

The democratization of indoor cellular connectivity has far-reaching implications. Small and medium-sized businesses, which often struggle to attract and retain talent due to limited resources, can now offer their employees and customers the same level of seamless mobile experiences as larger enterprises.

Healthcare facilities, regardless of their size, can ensure reliable indoor coverage for critical communications and applications. Multi-family residential complexes can provide tenants with uninterrupted cellular service, enhancing the overall living



A report by Mobile Experts estimated that CapEx for a CBRS-based NHN was significantly lower in cost compared to DAS and the 5-year TCO was 9% lower.

The University of Virginia



The University of Virginia faced connectivity challenges due to its sprawling campus and buildings constructed from materials that hindered cellular signals. They implemented a Neutral Host CBRS Network to address this, allowing mobile operators and UVA to share RAN resources. The network enhanced coverage for T-Mobile and AT&T subscribers, even in traditionally challenging areas. This initiative improves connectivity, reinforces safety measures, and unlocks opportunities for academic innovation. The first deployment is in a study hall building on the UVA campus.



Beyond voice – leveraging the NHN infrastructure to build new use cases that will thrive on private cellular networks

As enterprises strive to enhance indoor cellular connectivity, an emerging opportunity lies in the convergence of private cellular networks and public cellular coverage solutions. By investing in a unified infrastructure capable of supporting both private and public cellular services, businesses can maximize their return on investment while enabling a wide range of mission-critical use cases enabled by private networking and ensuring seamless indoor coverage for employees, guests, and tenants.

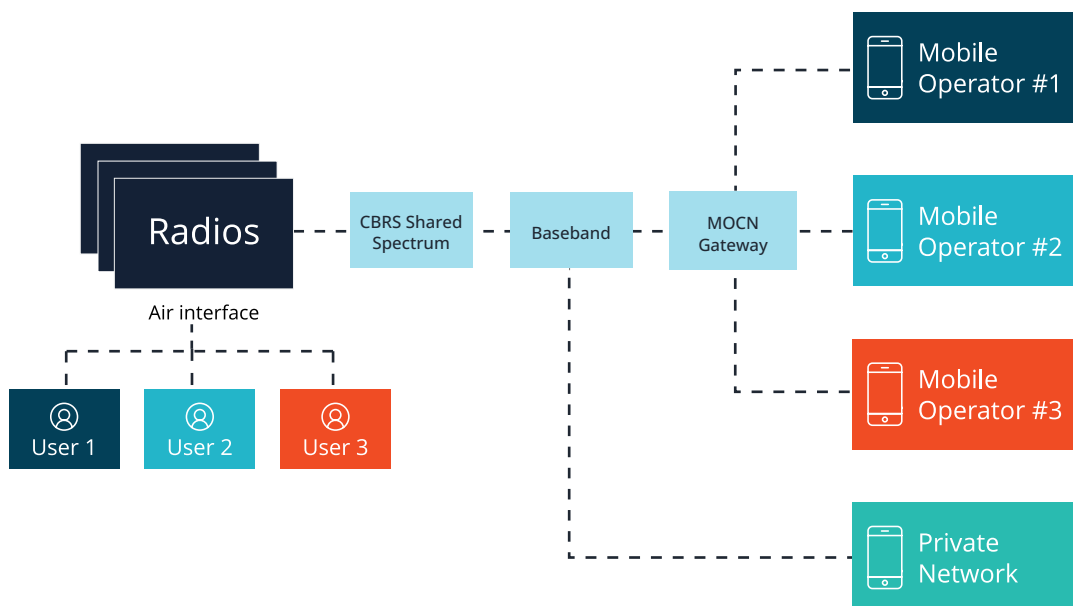
Neutral host CBRS networks utilize the same network infrastructure as private cellular networks powered by technologies such as LTE, 5G, and CBRS shared spectrum. It offers enterprises a dedicated, secure, highly reliable wireless infrastructure tailored to their specific operational requirements. These networks enable a host of business-critical applications, from Industry 4.0 and smart manufacturing to autonomous robotics, precision agriculture, and mission-critical IoT deployments.

The true potential of private cellular networks is amplified when combined with robust indoor public cellular coverage. By leveraging a shared infrastructure model, enterprises can support their private network deployments and extend the reach of public cellular services within their facilities, addressing the persistent challenge of indoor coverage and capacity limitations, all with the same network infrastructure.



“ DAS is an excellent solution in the right circumstances, but we are seeing that CBRS-based solutions are 50-70% less expensive because they involve fewer access points, fewer antennae, and can be installed on existing LAN infrastructure.

Mehmet Yavuz,
CTO and co-founder, Celona



This convergence of private and public cellular services on a shared infrastructure offers numerous business benefits. First and foremost, it maximizes the return on investment by enabling the infrastructure to serve multiple purposes, reducing the overall cost of ownership, and eliminating the need for separate, dedicated deployments for each use case.

Additionally, the synergy between private and public cellular networks enhances operational efficiency and user experiences. Employees and guests can seamlessly transition between the private and public networks, ensuring uninterrupted connectivity and access to critical applications and services, regardless of location within the facility or campus.

Furthermore, this unified approach simplifies network management and maintenance, as a single infrastructure supports both private and public cellular services, reducing operational complexities and enabling streamlined updates, upgrades, and optimizations.

As 5G continues to roll out and enterprises explore the intriguing potential of private networks, the opportunity to leverage a shared infrastructure model that supports private and public cellular services becomes increasingly compelling.

By embracing this convergence, businesses can future-proof their connectivity strategy, drive digital transformation initiatives, and unlock new operational efficiency, productivity, and customer satisfaction levels.



“
We can save money on a distributed antenna network by putting in a neutral host CBRS network, and in addition, we get all the other benefits of a private 5G network. ”

Christian Lindmark, Vice President -
Chief Technology Officer at a major US
academic medical center

Key Considerations to Make the Right Choices

Choosing the right technology

As enterprises set out to tackle indoor cellular connectivity challenges, they confront a diverse landscape of technology options, each offering unique strengths and applications. There is no one-size-fits-all solution or set of solutions. The connectivity ecosystem is evolving rapidly, and any or all of these can operate in tandem, with Wi-Fi offloading data traffic from the cellular network, while DAS and CBRS solutions ensure seamless voice and mobility support. Facilities with existing DAS networks can also add a CBRS-based NHN to extend or overlay coverage.

However, the right technology mix will depend on the enterprise's specific industry vertical and use case requirements, including whether private network functionality and improved indoor cellular connectivity are needed. For example:

Nearly 80%⁴ of **Commercial Real Estate** properties have poor or even no cellular coverage, so owners can significantly improve property values and competitive advantages with reliable indoor cell coverage by offering premium connectivity options to business and residential tenants, such as keyless entry and smart thermostats. Furthermore, building owners can become neutral host providers, generating revenue from high-value communications services.

A combination of Wi-Fi and CBRS-based private cellular and neutral host networks deliver robust **college** campus coverage, supporting educational apps, online resources, seamless indoor-outdoor cell phone coverage, and multimedia content delivery. Private network capabilities enable advanced use cases like remote learning and virtual reality-based teaching.

In-store analytics, asset tracking, and immersive shopping experiences are key use cases for **retailers**. A neutral host network with private network functionality can enhance the customer experience through seamless roaming, location-based services, and targeted promotions.

⁴ SOLiD Connectivity Report: Commercial Real Estate

Providing seamless, high-speed connectivity throughout a **hospitality** property is essential for guest satisfaction and to remain competitive. A NHN with private network capabilities can ensure reliable coverage and capacity for high-density environments like convention centers and hotels, supporting bandwidth-intensive applications like video streaming and online gaming. Wi-Fi and CBRS networks will provide employees and customers with the coverage needed.

In **airports**, a combination of DAS, CBRS neutral host networks, and Wi-Fi provide seamless connectivity in terminals, lounges, and concourses, enabling passengers and employees to stay connected. Private network capabilities support critical operations like baggage handling, security screenings, and real-time flight tracking. An airport can also become a neutral host network provider and offer revenue-generating communications services to airline and vendor tenants.

A blend of DAS, CBRS neutral host networks, and Wi-Fi for reliable coverage and capacity in high-density **venues** are necessary to allow fans to share experiences on social media, access mobile apps, and stream live events. Private network functionality provides secure communications, enhances operations, and enables innovative experiences.

For new building construction, CBRS-based networks are a must-have with their ability to provide both neutral host and private network capabilities.

	Multi-purpose	Shares Resources	Easy to manage	Quick to deploy	Economical	Highly secure
Wi-Fi	✓	✓	✓	✓		
DAS		✓				
Single-operator small cells			✓	✓		✓
Multi-operator small cells		✓	✓	✓	✓	✓
CBRS using MOCN	✓	✓	✓	✓	✓	✓

Choosing the right neutral host provider

Once an enterprise has determined that a neutral host solution is the optimal approach to addressing its indoor cellular connectivity needs, the next critical step is selecting the right provider. With the CBRS ecosystem proliferating, a rapidly increasing number of vendors offer neutral host solutions.

Neutral host and private cellular networks are typically managed as part of a cohesive IT infrastructure and often enable critical operational use cases and applications. Cellular technology differs from other wireless solutions enterprises adopt, requiring different planning, deployment, and management considerations. In addition to having experience with private cellular network technology, consider the solution provider's ability to seamlessly integrate with existing IT infrastructure, network management, and operational systems, ensuring a cohesive and streamlined operation.

Enterprises have a choice between total control with CAPEX-intensive investment by purchasing and managing all components of a neutral host network or, on the other end of the spectrum (no pun intended!), neutral-host-as-a-service (NHaaS) offering flexible, pay-as-you-go pricing models aligned with organizations' budgets and growth trajectories, making them accessible to enterprises of all sizes and across various industries.

With the NHaaS model, enterprises can leverage state-of-the-art in-building cellular infrastructure without substantial upfront investments. NHaaS providers can handle the design, deployment, and ongoing management of the neutral host network,



“ The biggest challenge as you get into any new space like this is trying to figure out who's going be around in the next 3 to 5 years, right? Because you have a lot of different companies coming into this space. **”**

Christian Lindmark, Vice President - Chief Technology Officer at a major US academic medical center

which not only has a low entry barrier but NHaaS providers have the unique expertise without having to bring that talent in-house.

Other factors to consider include:

- ✓ Experience in deploying neutral host networks
- ✓ Knowledge of your industry's challenges and requirements
- ✓ Technical capabilities
- ✓ Comprehensive suite of services
- ✓ Relationships with mobile network operators
- ✓ Financial stability and long-term viability
- ✓ SLAs and customer support

Careful evaluation against these criteria will help enterprises choose the right neutral host provider.

Arizona State University



Arizona State University uses a Neutral Host Network-as-a-Service to improve coverage using the CBRS band inside their University Services Building. It encompasses roughly 150,000 square feet, housing critical departments like Human Resources, Facilities Management, and Financial Services. With its initial success, ASU is now looking into providing services to other buildings and adding private network applications.



Stanford Health Care

Stanford Health Care (SHC) has signed an agreement with Celona to standardize on Celona's 5G LAN products and technology across its hospitals and clinics.

This move will advance the quality and speed of healthcare services and electronic communications by deploying the first dual-purpose 5G LAN infrastructure supporting neutral host and private wireless use cases.

Stanford Health Care will initially roll out Celona's private wireless and neutral host connectivity services across four buildings - a hospital facility and three medical office locations.

This initial phase will provide in-building public cellular coverage for mobile subscribers as well as private networking to enable critical clinical use cases.

The private wireless network will unlock new use cases like critical clinical communications apps on mobile devices, handhelds, and IoT endpoints. Simultaneously, the neutral host capability powered by Celona's cloud-based multi-operator exchange will provide seamless in-building cellular for patients, visitors, and others.



Conclusion

Providing reliable indoor cellular connectivity is no longer just a luxury for enterprises - it's a strategic imperative. As traditional carrier-funded models falter in addressing the growing demand for ubiquitous indoor coverage, neutral host cellular networks powered by innovative technologies like CBRS present a compelling solution.

Enterprises have billions of square feet of indoor spaces needing improved coverage and capacity. While DAS systems have served indoor connectivity solutions to large venues, the emergence of shared spectrum-based neutral host networks has made high-performance indoor cellular connectivity more accessible, available to enterprises of all sizes and across various industries.

Moreover, the convergence of neutral host networks and private cellular networks presents a unique opportunity for enterprises to maximize their return on investment. By investing in a unified infrastructure supporting public and private cellular services, businesses can future-proof their connectivity strategy while enabling a wide range of mission-critical use cases driven by digital transformation initiatives.

Sponsor Profiles

The authors gratefully acknowledge the generous support of [Celona](#) and [OnGo Alliance](#), without which this report would not have been possible.



The **OnGo Alliance** is an industry consortium that promotes the development, commercialization, and adoption of LTE and 5G solutions for the US 3.5 GHz Citizens Broadband Radio Service (CBRS) and evangelizes shared spectrum globally. Formerly the CBRS Alliance, this 110+ member group accelerates the buildout of effective and efficient CBRS networks, using 4G and 5G solutions. There are over 370,000 CBRS Access Points across the U.S. currently broadcasting wireless signals on the CBRS spectrum via private and fixed wireless networks, spanning various sectors, including enterprise IT, industrial IoT, smart cities, rural broadband, transportation, hospitality, retail, and real estate. The Alliance has also established a product certification program for OnGo equipment in the CBRS band, ensuring multi-vendor interoperability. For more information, please visit www.ongoalliance.org and follow the OnGo Alliance on [LinkedIn](#) and [Twitter](#).



Based in Silicon Valley, **Celona** is a pioneer and leading innovator of enterprise private wireless solutions. The company is credited with developing the industry's first 5G LAN system, a turnkey, 4G/5G system that enables enterprises and mobile network operators to address the growing demands for more deterministic wireless connectivity for critical business applications and vital use cases not met by conventional wireless alternatives. Celona's products and technology have been selected and deployed by a wide range of customers including Verizon, NTT, SBA Communications, Standard Steel and Haslam Sports Group. To date, the company has raised \$100 million in venture funding from Lightspeed Venture Partners, Norwest Venture Partners, NTT Ventures, Cervin Ventures, DigitalBridge and Qualcomm Ventures. For more information, please follow [Celona](#) on [LinkedIn](#) and [Twitter](#).



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About PrivateLTEand5G.com

PrivateLTEand5G is the industry's only B2B media publication for everything related to Private Cellular Networks. The publication provides network operators, telecom vendors, service providers, and enterprises with critical insights to commercialize private LTE and 5G networks. It regularly shares significant enterprise private wireless deployments around the globe.

The publication hosts the podcast "Alignment" to have engaging discussions with industry leaders on the supply as well as demand side, revealing their thoughts and plans for wireless connectivity, as well as other diverse yet related topics, including IoT security, the distributed edge, CBRS, and navigating the myriad choices available for private networks.

PrivateLTEand5G.com is a division of KAIROS Pulse, a strategic consulting company specializing in aligning technology with business value for B2B technology companies.



About KAIROS Pulse

We help B2B technology companies align, accelerate, and scale their product marketing and sales enablement.

Our team of industry visionaries and marketing experts accelerate the growth of B2B technology companies by aligning their strategies with target market needs, excelling sales effectiveness with engaging content and sales tools, and automating sales and marketing operations.

We offer a unique combination of market knowledge, technology depth, creative storytelling, and entrepreneurial attitude. We believe that misalignment is the foundation of broken businesses, and we are on a mission to fix this foundational gap. Agile and result-oriented, we will help you move the needle.

We have decades of experience working with technology vendors, telecom carriers, "as-a-service" providers, managed service providers, and enterprises. Telecom and Software are in our DNA. Alignment is at the core of everything we do.

If you would like to AMPLIFY YOUR BRAND or you want to ALIGN, ACCELERATE, and SCALE your product stories, let's chat!

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