5G Fixed Wireless Access Solutions

Reach new subscribers and increase return on investment on 5G spectrum

Deliver fast, reliable broadband

WITH 5G FIXED WIRELESS ACCESS SOLUTIONS FROM VANTIVA

Home user bandwidth demands are surging due to growing trends in remote work and learning, 4K TV and streaming, cloud applications, online gaming, and other connected home activities.

In addition to the ceaseless number of data-hungry apps demanding bandwidth, more and more connected devices and concurrent users in the home are creating a bottleneck in the network and a need for better broadband. As technologies advance, including the Internet of Things (IoT), 4K/8K UltraHD TV, virtual and augmented reality (VR/AR), and smart buildings and grids, the demand only becomes more pressing. Consumers expect reliable, seamless, and immediate interaction with applications, games, and video streams, with fast, uninterrupted downloads.

In short, **consumers need a high-speed, low-latency connection** that has the capacity to effortlessly keep up with advancing applications, services, and features — and they want solutions that are easy to install, simple to navigate, and affordable. For decades, the wireline network has been the undisputed leader in broadband, but the advent of mobile networks has given rise to a new contender in connectivity. **5G Fixed Wireless Access (FWA) offers a flexible, next-generation broadband experience** that serves as an effective alternative to fiber or cable in regions where rollout is limited or as a backup connection for homes and small to medium-sized businesses (SMBs) — opening up new options for subscribers and providers across the globe.

Fixed Wireless Access from Inception to Mass Market

For years, fixed wireless access had been successfully used in rural settings and other areas underserved by wireline broadband services. However, the distances involved required the use of expensive outdoor CPE with line of sight to the cell site, and needed to be installed by trained technicians, adding cost and time. Until recently, these factors limited the use of fixed wireless access technology in urban areas.

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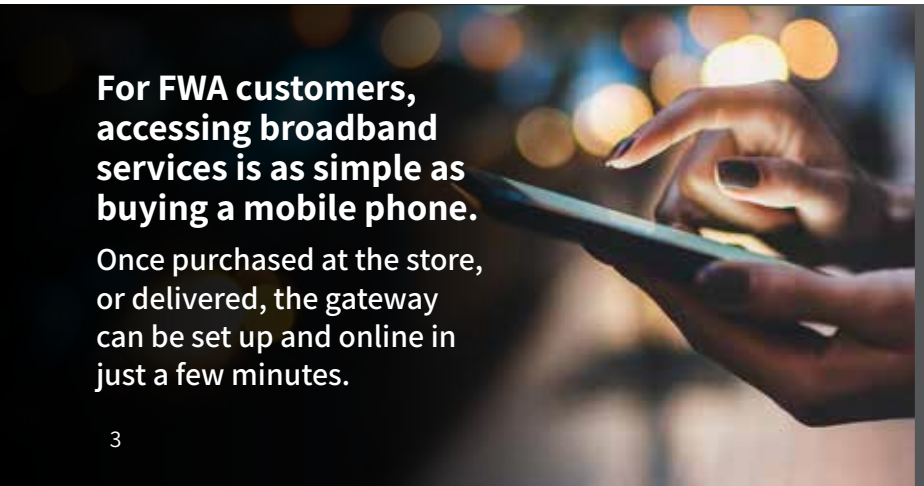
Expanding fixed wireless access from rural applications to large-scale deployments

Advances in wireless technology, in particular 5G NR transmission improvements like subcarrier spacing and channel bandwidth and innovative antenna technologies including beamforming and massive MIMO, now make FWA a viable alternative for delivering broadband services at speeds that can compete with fixed networks in urban and suburban areas. In suburban areas covered by copper, the distances involved can limit broadband speeds to 10Mbps with single-line VDSL2 and 20-30Mbps with bonded VDSL2 due to significant loss of signal strength — even with developments like vectoring and bonded vectoring. **FWA can typically deliver a higher-speed service,** reaching 50-400Mbps on 4G LTE and 100Mbps up to 1Gbps with 5G, depending on the available network. That means you can offer broadband access over the mobile network without compromising quality or reliability.

There is now **a strong business case** for fixed wireless access (FWA) to address urban and suburban areas using indoor, non-line-of-sight broadband gateways that can be installed by the end-user. These devices, which use internal antennas, can be shipped to the consumer, who can **simply plug in the device and get started** — there's no need for a technician to install. That means **fast, low-cost installation and near-instant connectivity.**

Key benefits

- Competitive broadband services
- Simplicity in setting up new customers to provide instant connectivity
- Fast, easy CPE self-installation and management with our NaviGate 5G™ and NaviGate Companion™ apps
- A "pay as you grow" model that leverages existing mobile infrastructure with the ability to scale up capacity in line with subscriber growth
- New capacity faster and at a lower cost than fiber



For FWA customers, accessing broadband services is as simple as buying a mobile phone.

Once purchased at the store, or delivered, the gateway can be set up and online in just a few minutes.

The benefits of self-install CPE

Indoor FWA gateways equipped with high-quality internal antennas have transformed the business case for FWA in urban and suburban areas where the distances allow for non-line-of-sight connections.

- The cost of the device is much lower using indoor CPE, as a single unit can be used vs. two boxes needed for outdoor CPE installation. Outdoor CPE also requires additional cables, mounting brackets, and power supplies — with the second unit needing to be ruggedized and weatherproofed.
- Installation costs are slashed because there is no need for a technician to visit, except in unusual circumstances.

Fixed wireless access in motion

mobile operators

Competitive broadband services for mobile operators

Mobile operators are well placed to use FWA to offer competitive broadband services in urban, suburban, and rural geographies.

With **mobile network operators projected to invest more than $1.1 trillion in their networks by 2025**[1], and about 80% of that in 5G technology, **FWA provides a solid business case to deliver recurring revenue streams and a return on 5G spectrum investment** to compete with fiber and cable services.

fixed line

FWA for fixed-line service providers

FWA is not just for mobile operators; it can also be an attractive access option for telcos and cable operators with access to their own or MVNO 5G networks. **The rapid deployment of FWA can complement a fiber strategy,** particularly when faced with competitive pressure to deploy broadband service quickly in a specific area.

Indeed, FWA can be used to connect new subscribers where fixed-line providers have yet to deploy the last mile of their wired networks. By shipping a new subscriber **a self-installable FWA gateway,** service providers can deliver broadband services and begin generating revenue immediately — rather than waiting for a technician to run fiber to the home. Once the wireline is in place, **the FWA gateway can serve as a backup network connection, automatically switching to the wireless connection if the wired network fails.** This benefit of a FWA backup connection extends to **SMBs,** enabling service providers to offer an uninterrupted, always-on connection that reduces or eliminates downtime.

All of this provides an additional layer of flexibility for operators and reliability for those who depend on broadband for many aspects of their lives including work, school, healthcare, home security, and more.

new build

FWA: an alternative to traditional wired networks for new build

Setting up new customers to a traditional wired network requires each subscriber to be individually connected. This involves significant investment per customer, with challenges related to right-of-way, digging, civil works planning, and entering subscriber property — and **it can often take weeks to complete the entire process of running a wireline connection to the home.** With FWA, right-of-way and civil works are only required if a new cell site is needed. Even with this added process, new cell sites deliver **better broadband performance for subscribers.** Additionally, once finished, each cell site provides coverage for a large number of potential customers. After a short wait for the gateway delivery, **customers can be online in minutes with a simple plug-and-play installation and setup.**

Additionally, traditional fiber consumers are often asked to enter into long-term contracts, necessary to recover the investment of a wireline connection to the individual home. With a wireless connection, the investment is spread across multiple customers — allowing for differentiated or shortened contract terms.

[1] GSM Association. The Mobile Economy 2022, 2022.

5G will account for a third of global FWA subscriptions by 2027

52 operators

launched 5G FWA networks by 2Q22

FWA was one of the first use cases for 5G, and 52 operators around the world had launched 5G FWA networks by 2Q22.

35M

5G FWA subscribers by end of 2027

5G FWA has good growth prospects and Omdia forecasts that the number of 5G FWA subscriptions worldwide will rise from 1.63 million at end-2021 to 35.14 million at end-2027.

58% growth

in 5G FWA global subscriptions from 2022 to 2027

5G FWA will account for 58% of the growth in global FWA subscriptions between the end of 2022 and 2027. By 2027, 5G FWA will account for 33.5% of the 104.84 million FWA subscriptions worldwide.

5G FWA

is a stronger option for fixed connectivity than earlier technologies

5G FWA is a stronger option for fixed connectivity than FWA based on earlier technologies and offers mobile-only or other alternative providers a vehicle to move into the fixed-broadband market.

Reed, Matthew. 5G Pioneers in Service Provider Markets, Omdia, September 2022.

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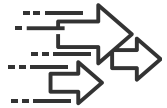
Vantiva indoor home networking solutions enable service providers to:

Leverage open-source software to deliver leading-edge services with the flexibility to deploy containerized applications

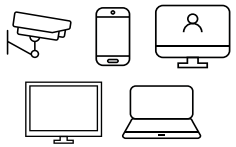
Simplify broadband deployment



Accelerate time to market

EXAMINING THE CHALLENGES OF FIXED WIRELESS ACCESS SOLUTIONS

Despite the 5G FWA market experiencing immense growth and continued innovation, the technology is not without limitations. These constraints are often due to a few critical factors:



Limited spectrum availability

Due to its reliance on wireless spectrum to transmit data, congestion within the available bands (particularly the low bands utilized by mobile devices) can cause performance to suffer — resulting in latency, lag, and slower speeds.

Signal range and degradation

Distance from the base station, weather conditions, and physical obstacles like walls, buildings, and structures can cause attenuation, impacting the reliability and consistency of signal quality, particularly for non-line-of-sight deployments.

Interference, capacity, and collision

Network and service quality is heavily influenced by nearby electronic devices, competing wireless networks, and the number of users transmitting data concurrently across frequencies, creating performance issues — particularly for bandwidth-intensive applications with greater capacity demands.

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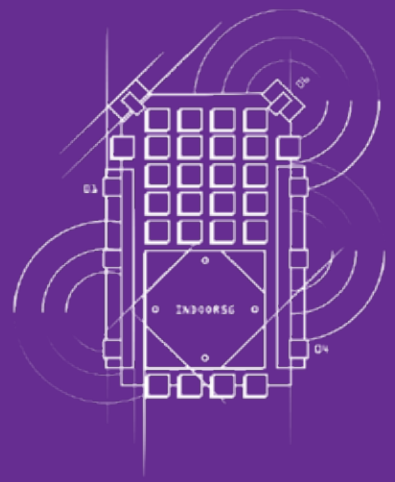
The engineers at Vantiva have developed a class of FWA products that address these concerns to deliver a better user experience with lower latency, faster download and upload speeds, consistent data transfer, and overall enhanced performance.



Powered by Indoor5G™ technology

Equipped with our Indoor5G antenna technology with self-optimizing capabilities, sophisticated surround antenna system, smart performance algorithm, and high-gain, high-efficiency 5G boosters, our FWA CPEs can manage signal reception dynamically and intelligently to deliver optimal home connectivity.

Sophisticated surround antenna system with strategically placed cellular antennas to prevent interference and capture signals at up-to-360°.

High-gain, high-efficiency Indoor5G boosters tuned to 3.5 GHz are specifically designed to capture the mid-band frequencies critical for high-speed data transmission, avoiding cannibalization of low bands used by mobile devices.

Intelligent antenna configuration uses a smart algorithm to regularly reassess antenna performance depending on environmental changes, identifying the most advantageous configuration to ensure consistent, optimal connectivity in any conditions.

Taking 5G to the next level

Vantiva is always innovating to deliver state-of-the-art features and capabilities that add value to our products, maintaining the high quality synonymous with our brand. Our latest 5G FWA gateway comes equipped with:

Ruralboost™

5G is perfect for most rural locations, but service can still be unstable in some remote areas. By improving throughput in the low bands (by up to 3.5x), RuralBoost can deliver a better connection to subscribers that may be otherwise inaccessible.

WANsensing™

Equipped with a configurable 2.5 GB WAN Ethernet port, our proprietary WANsensing technology intelligently switches to a wired connection in the event the wireless service falters or fails, delivering a powerful, consistent connection for broadband customers with critical service or business continuity demands.

Purpose-Built Management Tools

NaviGate 5G™ and NaviGate Companion™: Apps to guide to your gateway

Simplified device setup

For wireless connections, it's crucial to identify the best possible location in the home for strong signal reception. The **Vantiva NaviGate 5G mobile app** is designed to simplify the self-installation process, enabling consumers to determine tower location, gateway positioning, and includes signal quality testing to ensure optimal 5G performance.

Better broadband management

The **NaviGate Companion app** allows users to remotely monitor and manage their home networks in real-time, from anywhere, and the ability to opt-in to value-added services offered by their providers. The app grants end users visibility into connected devices on the network and enables a plethora of functions including connecting new Wi-Fi extenders, performing speed tests, managing advanced Wi-Fi settings and security, and defining parental controls and other access controls for guests.

Along with the ability to deliver value-added services like enhanced security, gaming optimization, and bandwidth slicing, the NaviGate Companion app gives operators a glimpse into their subscribers' usage patterns. This enables them to adapt, customize, and evolve their offerings to align with demand, leading to higher levels of customer satisfaction and loyalty. NaviGate Companion can also be integrated into existing customer systems like support ticketing and billing to simplify management processes.

Homeware™ from Vantiva

An intuitive, operator-grade device software platform

Leveraging the benefits of OpenWRT open-source software, Homeware enables service providers to deliver leading-edge services to customers and retain more control over the devices on their networks.

HOMEWARE

Open-source
Homeware is part of the mutually beneficial OpenWRT community of developers, both gaining from and contributing to testing, growth, innovations, and improvements to the software.

Interoperability
Homeware provides seamless multivendor interoperability supporting various deployment and use-case scenarios, reducing time to market and allowing service providers to deliver a consistent user experience, regardless of access technology.

Advanced security
Homeware boasts a software architecture design built on end-to-end security to reduce the risk of vulnerabilities. It undergoes three rigorous security checks: during development, validation, and once products are delivered. Products are also validated by independent third-party security labs.

Vantiva's 5G FWA Indoor Home Gateways with High-Performance Wi-Fi®

Vantiva's 5G FWA gateways are designed with **the integrated functionality of a modem and a premium Wi-Fi router in a single device to deliver a next-generation broadband experience.** As the number of connected devices in homes continues to grow, lack of dependable, ubiquitous Wi-Fi can result in consumer dissatisfaction and increased support costs. By leveraging more than 20 years of expertise in Wi-Fi and 4G, our 5G FWA solutions provide high and reliable downlink and uplink speeds, improve 5G signal reception indoors, and enable whole-home Wi-Fi coverage.

Why Vantiva?

Vantiva is an established leader in the industry, having sold millions of FWA devices worldwide. With a strong commitment to quality and customer satisfaction, Vantiva has become the go-to provider for cutting-edge FWA technology, empowering homes and businesses to stay seamlessly connected.

Supply chain resilience — With flex-manufacturing, diversified sourcing, advanced supply chain mapping, and a comprehensive visibility platform, we deliver reliable logistic excellence through proactively managed supply chain events and real-time predictive insights.

Reliable partner ecosystem — Vantiva works in collaboration with trusted partners to mitigate risks and establish mutually beneficial long-term agreements to ensure excellence across supply and production planning.

End-to-end expertise — With a concentrated focus on supply resilience, agile demand and supply planning, rapid crisis management, and strategic proximity to suppliers and factories, our experts are able to deliver maximum efficiency, end-to-end.

Global manufacturing — Our intentional manufacturing expansion across the globe helps prevent production disruptions, giving us the capacity to deliver 100k CPE a day within our manufacturing network.

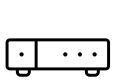
Let Vantiva help you stay ahead of the competition.

Would you like more information on any of the topics discussed in this eBook?
Learn more on our website.

Want to discuss how our solutions could benefit your business cases and network?
Contact us.

Our commitment to sustainability

The global demand for sustainable products grows ever stronger. Vantiva is dedicated to this cause, creating greener products that help reduce the carbon footprint. To achieve this, we've adopted eco-friendly practices across several key areas of our production process:



Devices

Packaging

Transport

Eco-housing

logistics

savings

ecosystem

We strive to engineer compact products with simplified electrical architectures to reduce power consumption and minimize our environmental impact.

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