



# ***Point-to-Multipoint 500 Series***

For 3.5 GHz Licensed Spectrum





## MOTOROLA UNLEASHES THE POWER AND RANGE OF 3.5 GHZ LICENSED SPECTRUM

Network operators with 3.5 GHz licensed spectrum own the potential for delivering service with exceptionally high power, range and bandwidth. Motorola's 500 Series wireless broadband access network is a fixed outdoor solution offering a light, self-contained infrastructure and empowering operators to turn that high potential into productive reality in low-density deployments. The Point-to-Multipoint (PMP) 500 Series enables 3.5 GHz spectrum holders—whether they are service providers, municipalities or enterprises—to maximize range and throughput, increase customer satisfaction and optimize ROI.

The Motorola 500 Series enables operators to develop sustainable business models based on significant benefits inherent in licensed frequencies, including:

- **Reaching More Customers.** A critical difference between licensed and unlicensed spectrum is the availability of higher power to deliver longer range. Without the power restrictions that limit unlicensed frequencies, the 3.5 GHz licensed band provides exceptional power levels that enable longer range connectivity. The 500 Series helps networks extend coverage to reach more customers in remote areas.
- **Providing In-Demand Services.** Virtually all network subscribers and users want the newest services and applications. But these services are not only innovative and in demand; they're also extremely bandwidth-intensive and latency sensitive. Nevertheless, they are key to increasing customer satisfaction and capturing higher Average Revenue per User (ARPU). The 500 Series provides useable throughput rates of up to 13.5 Mbps, enabling operators to reliably deliver the high bandwidth that in-demand applications such as high-speed data, streaming video, gaming, VoIP and others require.
- **Overcoming Environmental Obstacles.** Even in licensed spectrum, environmental issues can adversely affect network performance. Obstacles including buildings, water and other reflective surfaces, terrain and topography elements such as

hills, trees and foliage can affect signal strength and performance. The 500 Series provides line-of-sight (LOS), near-line-of-sight (nLOS) and non-line-of-sight (NLOS) connectivity, to overcome these and other physical signal impediments, enabling operators to extend coverage and optimize performance.

- **Accelerating Return on Investment.** The Motorola 500 Series fixed wireless broadband solution helps operators owning 3.5 GHz licenses take full advantage of the strengths of the licensed frequency band. The 500 Series enables operators of all types to leverage higher power, longer ranges, increased bandwidth, enhanced customer satisfaction, reduced infrastructure costs and maximized ARPU to deliver timely, superior ROI.

The 500 Series makes use of the same robust technology and fast, cost-effective deployment scenarios that are the foundation of the numerous Motorola wireless broadband solutions around the globe today. Day in and day out, these Motorola networks are proving their reliability in a wide range of tough broadband environments, powering highly successful high-speed wireless networks in more than 4,000 systems in 120 countries. Motorola's wireless broadband portfolio offers a broad spectrum of options including licensed and unlicensed, LOS and NLOS, proprietary and standards-based solutions.

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# HIGH-PERFORMANCE, LOW-COST LIGHT INFRASTRUCTURE SOLUTION



Motorola's 500 Series systems utilize powerful, proven Access Points (AP) and Subscriber Modules (SM) that provide up to 54 Mbps of total useable throughput from a tower location to ranges of 10 km or more. The system is designed for four sector applications supporting up to 200 users per sector, and serving up to 800 customers from a single tower. The 500 Series provides up to 13.5 Mbps aggregate throughput per sector with less than 15 milliseconds of latency, as well as:



MOTOROLA POINT-TO-MULTIPOINT 500

- **Significantly Higher Power.** Greater power levels are inherent in licensed spectrum. The need to make the unlicensed band fair and equitable causes these frequencies to significantly restrict power levels. In Europe and Latin America, for example, unlicensed spectrum is restricted to approximately one watt. These limitations generally mean that more sites and more equipment are needed to optimize coverage and minimize interference. Licensed spectrum, on the other hand, has few if any interference issues and generally offers a theoretical power limit of 30 watts or more depending on channel size. This allows operators to cover greater distances, maximize capacity and serve more customers or users with considerably less infrastructure expense.
- **OFDM Technology.** The Motorola PTMP 500 Series uses Orthogonal Frequency Division Multiplexing (OFDM) technology to deliver exceptional nLOS/NLOS coverage. OFDM technology enables high-speed access in areas where typical wireless signals—even in licensed frequencies—are unable to penetrate foliage or go around buildings and other obstructions. The 500 Series' OFDM technology allows robust reception of blocked and reflected wireless broadband signals, maximizing performance and increasing customer satisfaction, ARPU and ROI.

- **Common Environment.** The Motorola 500 Series also shares a common environment with other Motorola wireless broadband solutions, including the same application level software, surge suppressors, mounting brackets, network management solutions and more. This minimizes training, support and inventory costs. In addition, licensed and unlicensed solutions can be deployed at the same tower location, leveraging infrastructure costs and reducing total cost of ownership.

For more information on how the Motorola 500 fixed wireless broadband PMP solution can help 3.5 GHz spectrum owners optimize coverage and capacity, maximize power and performance and significantly lower cost, contact your Motorola representative.

## UNLICENSED AND LICENSED SPECTRUM POWER LEVEL COMPARISON:

0 ----- WATTS ----- 30

**UNLICENSED SPECTRUM POWER LEVELS:**  
IN EUROPE AND LATIN AMERICA, RESTRICTED TO APPROXIMATELY ONE WATT

**LICENSED SPECTRUM POWER LEVELS:**  
POWER LIMIT OF 30 WATTS OR MORE DEPENDING ON CHANNEL SIZE

# REAL-WORLD APPLICATIONS FOR THE MOTOROLA 500 SERIES

How will 3.5 GHz licensed spectrum holders use the Motorola 500 Series fixed wireless broadband PMP solution in the real world? Following are a few typical scenarios in which the 500 Series is poised to help operators realize the powerful benefits of licensed spectrum.



## International Ski Resort.

An operator with a license for the mountains and valley of a popular international ski resort can use the 500 Series to bring high-speed service and high-demand applications to the owners of hotels and retail shops, as well as to permanent and seasonal residents...regardless of line-of-sight issues caused by terrain and development.

## The Motorola Wireless Broadband Portfolio

offers high-speed connectivity systems that support data, voice and video, enabling a broad range of fixed and mobile applications. With Motorola's innovative software solutions, customers can design, deploy and manage broadband networks, maximizing up-time and reliability while lowering installation costs.



## Large Office Park.

The owner of a geographically large, highly landscaped office park owns 3.5 GHz licensed spectrum and uses the Motorola 500 Series to connect the ten different buildings in the park. Despite nLOS and NLOS issues, each user in the park enjoys high-speed connectivity and the high bandwidth necessary to provide the innovative applications— from video surveillance to VoIP—that deliver competitive advantage and increased ROI.



## Remote Location.

A town of considerable size wants high-speed Internet access but is situated in a remote location surrounded by difficult terrain. A nearby service provider with a 3.5 GHz license may want to extend its network to provide wireless broadband service to these potentially profitable business and residential customers. Using the Motorola 500 Series, the operator can leverage the system's higher power and throughput levels to bring powerful signals and service to the location, and rely on its OFDM capabilities to navigate the natural obstacles inherent in the environment.



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