CASE STUDY

MasOrange strengthens network connectivity in challenging weather environments with Nokia's intelligent E-Band solution

“At MasOrange, we are constantly pushing the limits of network performance to meet our customers’ evolving needs. With Nokia’s E-Band UBT-m XP and SteadEband antenna, we’ve strengthened network resiliency, making our infrastructure less vulnerable to external conditions so customers enjoy the most reliable, fastest network despite natural adversities. This deployment delivers high-capacity, low-latency connectivity that stays stable in severe weather, enhances customer experience and prepares our network for future demands. It’s a clear example of how strategic technology choices safeguard performance and boost resilience.”

Bricio Valera López
Mobile Access Network Engineering Director
MasOrange

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MasOrange is a dominant force in the Spanish telecommunications landscape. The company provides a full suite of services including mobile voice and data, fixed-line connectivity, broadband internet and television packages. MasOrange positions itself as an innovative leader through investments in next-generation technologies, and its commitment to digital progress is evident in its 5G deployments, expansion of digital entertainment offerings and exploration of smart home integrations.

The company’s robust network infrastructure covers major cities, smaller towns and remote rural regions, reflecting its dedication to national connectivity. With ongoing investments in capacity and reliability, MasOrange is not only future-proofing its network but also pushing boundaries in customer experience. Whether it’s through high-speed 5G rollout or delivering immersive streaming services, MasOrange is establishing itself as a cornerstone of Spain’s digital ecosystem. This constant evolution demands cutting-edge technology, particularly in microwave transport solutions that can meet growing capacity and stability requirements—especially in geographically and environmentally demanding locations.

OBJECTIVE

Enhance long-distance network capacity and reliability in challenging weather conditions

Faced with the challenge of increasing capacity over an existing 18GHz microwave transport link, MasOrange sought a next-generation solution that could meet the growing bandwidth needs of its users without sacrificing reliability. The targeted deployment was a long-distance link spanning over 5 kilometers and exposed to intense weather variation. To reinforce this mission-critical span, MasOrange needed a high-performing E-Band solution capable of delivering significantly greater throughput and operational resilience.

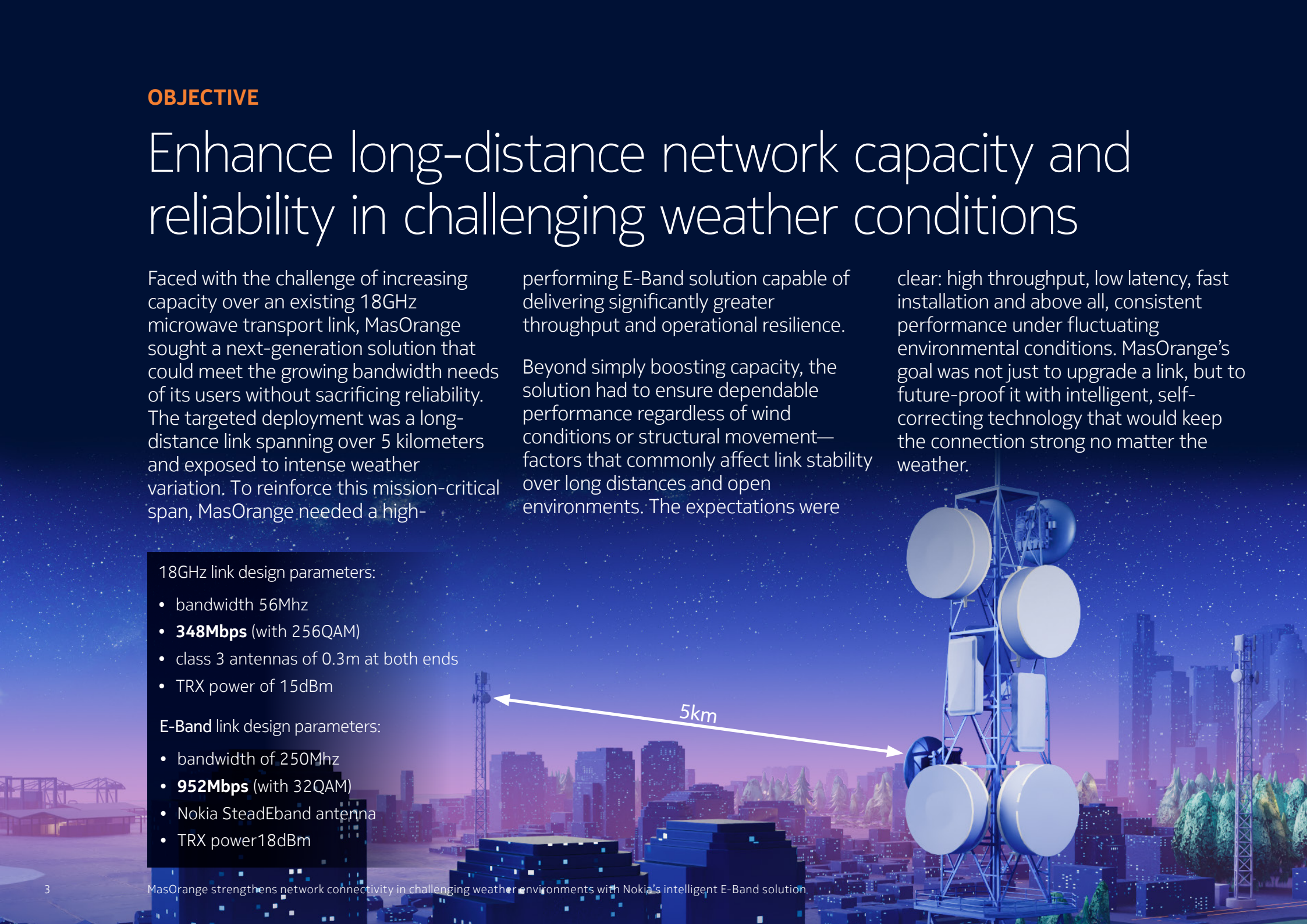
Beyond simply boosting capacity, the solution had to ensure dependable performance regardless of wind conditions or structural movement—factors that commonly affect link stability over long distances and open environments. The expectations were clear: high throughput, low latency, fast installation and above all, consistent performance under fluctuating environmental conditions. MasOrange's goal was not just to upgrade a link, but to future-proof it with intelligent, self-correcting technology that would keep the connection strong no matter the weather.

18GHz link design parameters:

- bandwidth 56Mhz
- **348Mbps** (with 256QAM)
- class 3 antennas of 0.3m at both ends
- TRX power of 15dBm

E-Band link design parameters:

- bandwidth of 250Mhz
- **952Mbps** (with 32QAM)
- Nokia SteadEband antenna
- TRX power18dBm



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SOLUTION

Smarter microwave transport with Nokia's UBT-m XP radio and SteadEband antenna

To meet MasOrange's demanding technical and environmental criteria, we deployed a combination of two cutting-edge technologies: the Wavence UBT-m XP E-Band radio and the SteadEband self-adjusting antenna. The UBT-m XP delivers ultra-high +24dBm transmit power, high-capacity 10Gbps throughput and low-latency performance at the 80GHz frequency band, ideal for urban boost and short-haul applications. With its all-in-one outdoor unit that integrates the modem and diplexer, our radio ensures simplified installation, easier maintenance and efficient spare parts management.

Complementing the radio is our SteadEband antenna—an intelligent stabilization system that maintains signal alignment by correcting both fast and gradual environmental disruptions. Whether responding instantly to wind gusts or slowly adjusting for solar-induced shifts, SteadEband corrects deviations up to ±4° in both elevation and azimuth. Specifically, it mitigates the impact of vibrations caused by wind and corrects misalignment resulting from solar bending, ensuring the link stays precisely aligned in real time. In practical terms, this means the link remains stable even in high wind and shifting structural conditions.

The E-Band link was set up over a 5.03km span in a streamlined configuration, designed to deliver 952Mbps—nearly triple the capacity of the older 18GHz link, which reached only 348Mbps. Thanks to advanced hardware and adaptive antenna technology, MasOrange achieved the strong, high-speed performance needed to support growing network demands.

RESULTS

Resilient network connectivity and throughput, regardless of weather conditions

The impact of our solution became immediately evident through both real-world stress testing and operational metrics. During the evaluation period, the region experienced extreme weather, including wind gusts reaching 52km/h. Despite these harsh conditions, the link with the SteadEband antenna maintained high modulation and never dropped below design capacity. On the receiving side, signal behavior was symmetrical, proving the link's consistency even when weather disrupted propagation.

One of the most striking outcomes was an average 30dB improvement in received signal level (RSL) after stabilization via SteadEband was activated. Compared to the legacy configuration or SteadEband without stabilization, this represented a dramatic reduction in signal variability and frame loss. Notably, the segment with the SteadEband unit experienced no loss of data packets or service unavailability—showing complete operational continuity.

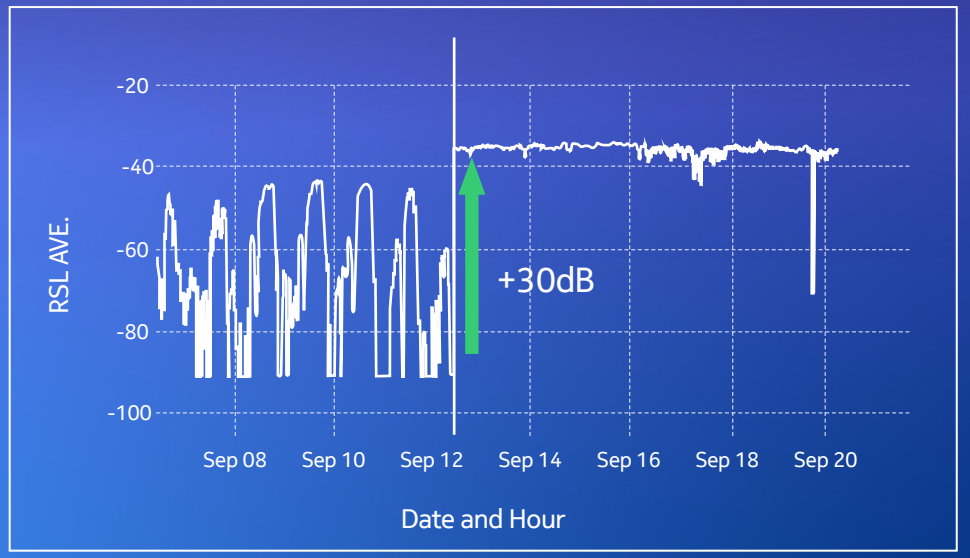
Additionally, the system corrected daily torsion effects on the tower, an issue that had previously caused frequent performance degradations due to solar heat-induced tower bending. Even under fluctuating solar radiation, the antenna alignment held steady. This reliable modulation at maximum capacity allowed the network to deliver seamless service to end-users and reinforced the business case for SteadEband as a critical enabler for high-performance E-Band spans.

Strong wind

36km/h

Wind gust

Up to 52km/h



GLOBAL PERSPECTIVE

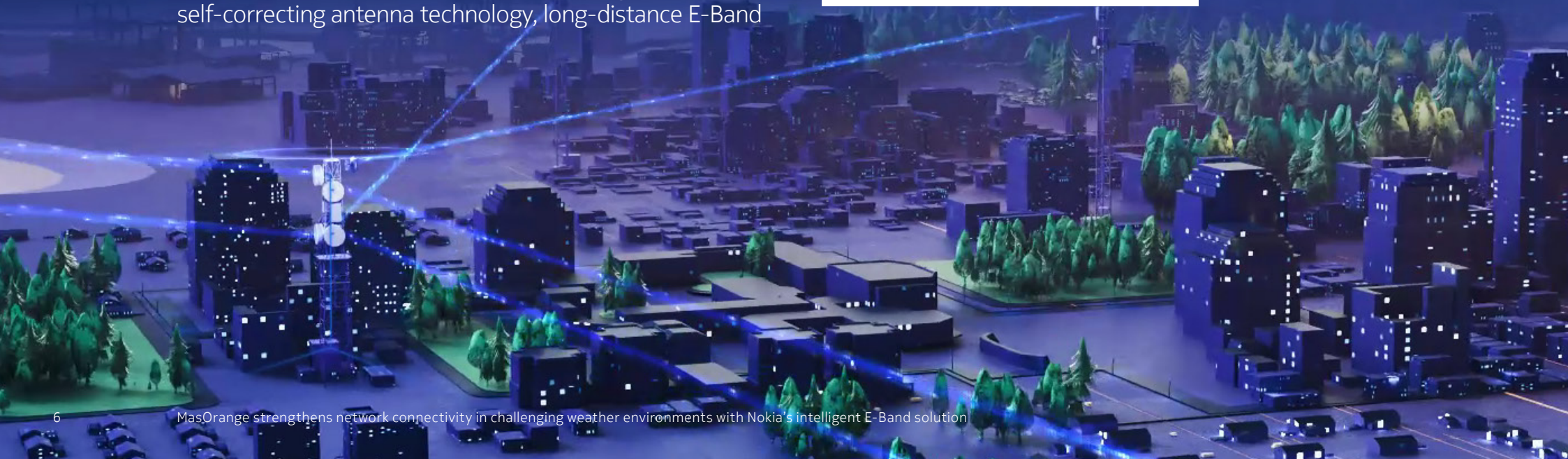
A scalable blueprint for high-performance E-Band networks

The success of this deployment in Spain showcases not only the strength of Nokia's microwave transport portfolio but also the broader applicability of adaptive antenna technology in E-Band use cases worldwide. As network operators face increasing demands for high-capacity backhaul and robust connectivity across geographically diverse terrains, the combination of UBT-m XP and SteadEband presents a compelling answer.

From urban rooftops to offshore links and mountainous regions, the need for intelligent stabilization is universal. This use case demonstrates that with the right hardware and self-correcting antenna technology, long-distance E-Band links can perform consistently, even under conditions that would typically challenge stability.

By delivering resilience, capacity gains and simplified operations, our solutions set a new standard for operators and regions seeking reliable, high-capacity wireless transport in challenging environments.

For more information, take a look at our Microwave transport webpage.



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At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.