

# Current and Future Use of the 42 GHz Band

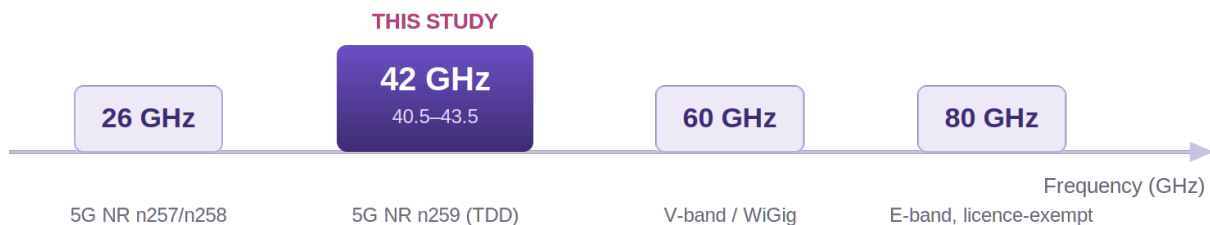


## STUDY 03 · MILLIMETRE-WAVE SPECTRUM

Technical, regulatory and market outlook for the 40.5–43.5 GHz band — a briefing for spectrum and telecom experts across the EU.

### AT A GLANCE

Study 03 examines how the 42 GHz band (40.5–43.5 GHz) is used today and how it could evolve. In the Czech Republic the band carries gigabit point-to-point fixed links, yet uptake stays modest next to the popular licence-exempt 70/80 GHz band. Globally, WRC-19 and CEPT decisions point toward future mobile/fixed (MFCN) use. The study sets out the band's physical limits, its standardisation status in ETSI and 3GPP, coexistence with satellite and radio-astronomy services, and recommendations for intensive, efficient use.



Millimetre-wave bands — the 42 GHz band sits between today's 26 GHz pioneer band and the popular licence-exempt 60/80 GHz bands.

## Why the band matters

Mobile data demand keeps rising while mid-band spectrum runs short. Millimetre-wave bands unlock very wide channels: the 42 GHz band offers up to 4 GHz of contiguous spectrum — enough to give every user a gigabit-class connection. Its narrow, highly directional beams almost eliminate mutual interference, which makes dense deployments practical. The band has already inspired confidence through proven mmWave technologies such as 60 GHz (V-band) and 80 GHz (E-band).

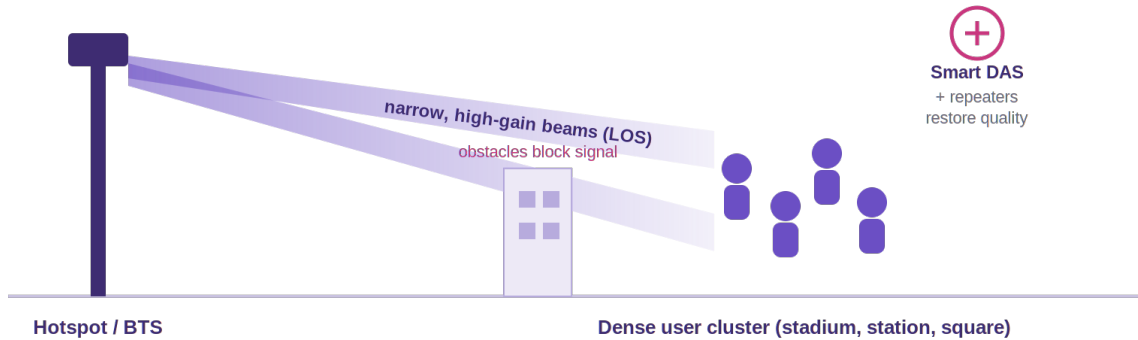
<b>40.5–43.5 GHz</b> band under study	<b>up to 4 GHz</b> contiguous spectrum	<b>50–400 MHz</b> channel blocks (n259, TDD)	<b>232 vs 13,649</b> 42 GHz vs 70/80 GHz fixed links, CZ Q2 2024
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## Inside the study — four chapters

<b>01</b> <b>Regulatory approaches</b> Current CZ use, WRC-19 outlook, coexistence and authorisation options.	<b>02</b> <b>Technical characteristics</b> Short range, propagation physics, deployment models and infrastructure.	<b>03</b> <b>Standardisation</b> ETSI and 3GPP work, the n259 channel and interoperability.	<b>04</b> <b>Innovation potential</b> Uses in telecoms and industry — FWA, backhaul, IIoT, VR/AR.
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## How the 42 GHz band behaves

Physics make 42 GHz a short-range technology. High antenna gain, narrow directivity and low tropospheric scattering suit dense urban and suburban hotspots — stadiums, stations, squares — and fixed access in line-of-sight; it is not suited to regional or nationwide coverage. In cities, buildings cause reflection and depolarisation losses (around 42 dB through walls at 39 GHz). Careful access-point placement, intelligent distributed antenna systems (DAS), smart repeaters and passive reflectors restore signal quality.



## Regulatory landscape at a glance

- **WRC-19** identified 37–43.5 GHz for future IMT; CEPT is harmonising 40.5–43.5 GHz for next-generation terrestrial systems.
- **ECC/DEC(22)06** sets MFCN conditions with 200 MHz blocks (multiples of 50 MHz), mirroring the 26 GHz approach.
- **Coexistence** with fixed-satellite (FSS), fixed (FS) and radio-astronomy (RAS) services relies on geographic separation plus coordination and exclusion zones.
- **Authorisation** is best handled through individual rights, with separate rules for high- and low-power or indoor hotspots.

## Where the innovation potential lies



### Industrial IoT

Fast, secure links for automated lines, robotics and real-time monitoring.



### VR / AR

High-quality streams for training, maintenance and engineering design.



### Surveillance

Real-time, high-resolution video at very low latency.



### Smart factories

Tighter machine-to-machine integration and process automation.

## RECOMMENDATIONS — FIVE PRIORITIES FOR EFFICIENT USE

1. Require active sector antennas that beam-form energy toward the client device (CPE).
2. Set minimum requirements that exploit massive MIMO and beamforming.
3. Provide a geolocation portal exposing shared-service usage for deployment planning.
4. Keep authorisation costs and barriers low to spark device demand and R&D.
5. Authorise via individual rights, distinguishing hotspot types and power levels.

## KEY TAKEAWAY

The 42 GHz band is a credible long-term candidate for high-capacity 5G and Industry 4.0 use, but today both demand and the regulatory frame still favour neighbouring mmWave bands. Low-cost authorisation, advanced antennas and clear coexistence rules will decide whether its 4 GHz of spectrum is put to work.