Dynamic Spectrum Alliance Limited
http://www.dynamicspectrumalliance.org

December 1, 2025

Hrvatska regulatorna agencija za mrežne djelatnosti (HAKOM)
Ulica Roberta Frangeša-Mihanovića 9
10110 Zagreb

Re: DSA response on Draft Strategic Activity Plan for Radio Frequency Spectrum Management

Dear Sir/Madam,

The Dynamic Spectrum Alliance (DSA)[1] welcomes the opportunity to contribute to the public consultation launched by the *Hrvatska regulatorna agencija za mrežne djelatnosti* (HAKOM) on the Strategic Plan for Radio Frequency Spectrum Management. The DSA commends HAKOM for publishing this Strategic Plan for the first time, as it provides valuable information and establishes a comprehensive regulatory framework for Croatia.

Our comments are particularly focused on Sections 6.2 and 6.3, which address spectrum sharing and the future of the upper 6 GHz band in Croatia.

The DSA stands ready to support HAKOM by providing global technical expertise, regulatory best practices, and analytical insights to ensure that the full potential of spectrum sharing and licence-exempt access to the 6 GHz band is realised for the benefit of Croatia's citizens and businesses

Sincerely,

Dr. Martha Suárez
President
Dynamic Spectrum Alliance

[1] The Dynamic Spectrum Alliance (the Alliance) is a global, cross-industry, not for profit organization advocating for laws, regulations, and economic best practices that will lead to more efficient utilization of spectrum, fostering innovation and affordable connectivity for all. Our membership spans multinationals, small-and medium-sized enterprises, as well as academic, research and other organizations from around the world all working to create innovative solutions that will benefit consumers and businesses alike by making spectrum abundant through dynamic spectrum sharing. A full list of Dynamic Spectrum Alliance members is available on the Dynamic Spectrum Alliance's website at www.dynamicspectrumalliance.org/members.

1. Comments to section 6.2. Spectrum Sharing

The Dynamic Spectrum Alliance (DSA) and its members collaborate with regulatory authorities worldwide to promote better broadband connectivity through innovative approaches to spectrum management. These approaches include adopting licensing frameworks that integrate licensed, unlicensed, and license-by-rule access options.

To maximize spectrum efficiency and provide diverse access options, the DSA recommends that HAKOM consider implementing automated Dynamic Spectrum Management System (DSMS) solutions alongside modern licensing frameworks.[2] Regulatory authorities globally will increasingly need automated DSMS tools to manage growing wireless demand by sharing underutilized frequency bands. Advances in computational power now enable rapid, sophisticated propagation analysis, facilitating near real-time coordination of devices and users. Furthermore, artificial intelligence techniques—such as machine learning for spectrum sensing and signal classification—can significantly enhance spectrum management.

In addition, more agile wireless equipment is being developed to interact directly with DSMS tools, creating opportunities for greater efficiency and scalability.

The DSA supports the Strategic Plan's proposals for spectrum sharing to make more spectrum available for new users and use cases. In particular, we strongly endorse a use-it-or-share-it policy approach.
Regarding other bands proposed in the Strategic Plan, the DSA encourages HAKOM to develop a coordinated spectrum access framework that incorporates advanced tools such as DSMS. This is especially relevant for the 3800–4200 MHz band.

Finally, HAKOM should consider including the 5925 – 6425 MHz band for spectrum sharing. Extensive studies conducted by CEPT,[3] FCC,[4] ISED[5], as well as real-world experience confirm that Low Power Indoors (LPI) and Very Low Power (VLP) Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operations can safely coexist with fixed and satellite incumbents across the 6 GHz band without any type of harmful interference to 6 GHz incumbents. Furthermore, licence-exempt access in the 6 GHz band could be expanded to outdoor applications using Automated Frequency Coordination (AFC) Systems.[6]

At the European level, the SE-45 group is working on an ECC report on Higher power WAS/RLAN with up to 4 W e.i.r.p. in the 5945−6425 MHz frequency band to enable dynamic spectrum access coordination. The scope of this work is to study technical conditions to enable the possible implementation of a dynamic spectrum access coordination function for WAS/RLANs in the 5945-6425 MHz frequency band, beyond what is permitted under ECC Decision (20)01. The DSA respectfully recommends HAKOM to include this band and opportunity in the Spectrum Sharing activities.

AFC is an advanced, database-driven coordination system that enables Standard Power devices to operate safely in the 6 GHz band while ensuring robust protection of incumbent fixed and satellite services. The AFC system determines spectrum availability in real time by validating the location and technical characteristics of each SP access point and authorizing channels and transmit power levels accordingly.

By adopting AFC, Croatia can:

- ✓ **Expand Last-Mile Broadband Availability:** Enable high-capacity service delivery in rural and peri-urban areas where traditional network deployments may be cost-prohibitive, thereby

---

[2] We recommend reading this report: https://www.dynamicspectrumalliance.org/solving-the-spectrum-crunch.pdf
[3] ECC Report 366: https://docdb.cept.org/document/28650
[4] https://docs.fcc.gov/public/attachments/FCC-20-51A1.pdf
[5] https://ised-isde.canada.ca/site/spectrum-management-telecommunications/en/spectrum-allocation/radio-local-area-network-rlan-6-ghz-band/decision-technical-and-policy-framework-licence-exempt-use-6-ghz-band
[6] https://eccwp.cept.org/default.aspx?groupid=66

supporting inclusive digital access across all regions.

- ✓ **Accelerate Smart City and Public Service Innovations:** Support deployment of outdoor, high-performance Wi-Fi essential for municipal connectivity needs, intelligent transportation systems, public safety operations, environmental monitoring, and large-scale IoT infrastructure.

- ✓ **Stimulate Private Sector Investment and Market Growth:** Provide regulatory certainty, interference safeguards, and spectrum access mechanisms needed to encourage investment from internet service providers, enterprises, and equipment manufacturers. This fosters innovation and enables diverse, large-scale deployments across public and private networks.

Moreover, AFC's dynamic coordination mechanism mitigates interference and optimizes spectrum utilization, enabling denser deployments and higher user capacities to support emerging industry verticals and advanced applications.

In summary, enabling SP operations governed by AFC positions Croatia to deploy widespread, resilient, and scalable 6 GHz connectivity. This approach supports socioeconomic development, enhances digital equity, and accelerates innovation across all sectors of the Croatian economy.

2. Comments to section 6.3. 6 GHz Band

The 6 GHz band represents a unique and strategically important opportunity to advance Croatia's digital transformation and is exceptionally well-suited to meeting the rapidly growing demand for high-capacity broadband across residential, enterprise, educational, healthcare, industrial, and public-sector environments.

Globally, many forward-looking administrations—including the United States, Canada, Saudi Arabia, and South Korea—have already authorised licence-exempt access across the entire 6 GHz band. These decisions have enabled the deployment of next-generation Wi-Fi technologies such as Wi-Fi 6E and Wi-Fi 7, accelerated innovation, and delivered significant socio-economic benefits through improved indoor connectivity, enhanced competition, and lower consumer costs.

The DSA strongly encourages HAKOM to adopt a similarly comprehensive approach by enabling full licence-exempt access to the entire 6 GHz range. Such a framework would unlock substantial economic, social, and technological value by supporting a competitive device ecosystem, enabling innovative digital services, expanding enterprise and industrial automation capabilities, and improving the affordability and quality of broadband for Croatian citizens.

Importance of the Full 6 GHz Band (5925–7125 MHz)

More than 75 countries[7] have already adopted licence-exempt policies for the 6 GHz band, contributing to a harmonised international market for devices, equipment, and services. This global momentum has catalysed a thriving ecosystem of Wi-Fi 6E and Wi-Fi 7 products, resulting in lower device costs, increased innovation, and faster adoption. For these reasons, the DSA supports licence-exempt access to the full 6 GHz band.

- **Gigabit Wi-Fi with Ultra-Low Latency**

  Enabling licence-exempt access to the full 6 GHz band allows Wi-Fi systems to operate using ultra-wide 160 MHz and 320 MHz channels, delivering multi-gigabit-per-second throughput with exceptionally low latency. This enhanced performance is essential for supporting bandwidth-

[7] Please see www.6GHz.info for more details

intensive and mission-critical applications, including seamless 4K/8K remote learning and entertainment, real-time telemedicine with high-resolution imaging, and next-generation augmented and virtual reality (AR/VR) experiences used for training, simulation, and collaborative work.

In addition, full-band access provides the reliability and responsiveness required for latency-sensitive services such as cloud gaming, advanced automation, robotics, and precision industrial operations. These capabilities are also foundational for smart-city deployments—including intelligent transportation systems, public-safety communications, environmental monitoring, and large-scale IoT sensor networks—delivering performance levels that are simply not achievable using legacy Wi-Fi or narrower-band spectrum allocations.

- **Long-Term Spectrum Efficiency and Policy Stability**

  Allocating the full 6 GHz band on a licence-exempt basis ensures long-term spectrum efficiency by reducing the risk of early congestion and enabling flexible use of wide channels. Full-band access allows regulators and operators to take advantage of dynamic channel selection, bonding, and interference-management techniques, supporting optimal network performance across diverse deployment environments and geographic conditions.

  Equally important, a comprehensive, full-band approach provides regulatory certainty and policy stability. By avoiding fragmented or incremental reallocations in the future, regulators minimise market uncertainty and prevent disruptive transitions that could delay commercial deployment. Clear and predictable long-term policy is essential for industry stakeholders, who must commit substantial investments to develop, deploy, and maintain the high-capacity public and private broadband networks that underpin national digital infrastructure.

- **Economic and Consumer Benefits**

  Full access to the complete 6 GHz band enables Wi-Fi networks to operate with ultra-wide channels and deliver multi-gigabit speeds, ultra-low latency, and high reliability in dense, multi-user environments. These capabilities are essential for supporting modern and emerging applications such as immersive AR/VR for remote training and education, real-time telemedicine with high-resolution imaging, and resilient smart-city platforms that integrate transportation systems, public safety services, and large-scale IoT deployments.

  Widespread availability of high-performance Wi-Fi additionally accelerates digital entrepreneurship by empowering small and medium-sized enterprises (SMEs) to innovate in service delivery, content production, and specialized digital applications. By lowering barriers to high-quality connectivity, the expanded Wi-Fi ecosystem stimulates competition, enhances consumer choice, and contributes directly to economic diversification and sustainable, broad-based growth.

- **For the case of Prioritised Band Split**

  If Croatia would consider a possible band split, the DSA recommends designating at least 320 MHz of contiguous spectrum at the bottom of the Upper 6 GHz band for licence-exempt use with the same access conditions for LPI and VLP use as the Lower 6 GHz band. This would preserve capacity for a variety of local broadband use cases, while avoiding spectrum fragmentation that could diminish spectral efficiency and reduce both consumer and enterprise benefits. For example, access to additional Upper 6 GHz spectrum is of critical importance for indoor enterprise deployments to avoid co-channel interference among densely spaced Wi-Fi access points,[8] which will be essential for reducing latency and enabling the capabilities of Wi-Fi 7 and Wi-Fi 8 to support mission-critical applications.

[8] The Wi-Fi industry notes that 10–12 independent, non-overlapping 80 MHz channels are needed for interference-free channel plans in enterprise-grade networks.

Socio-Economic Impact

- **Economic Growth and Competitiveness**: Enabling full access to the 6 GHz band—particularly with Standard Power operations managed through AFC—is not merely a technical decision but a strategic economic policy choice. Globally, Wi-Fi contributes over USD 5 trillion in annual economic value,[9] with the greatest benefits accruing to small and medium-sized enterprises (SMEs), local innovators, and digital service providers.
  License-exempt spectrum substantially lowers the cost of deploying high-performance broadband, allowing Croatian SMEs to expand their participation in e-commerce, digital content creation, cloud-based services, and advanced industrial applications. These dynamics directly support national goals for economic diversification, productivity growth, and job creation, particularly in high-value digital sectors.

- **Advancing Digital Inclusion and Public Service Delivery**: Full-band Wi-Fi access also carries significant social benefits. Affordable, high-capacity networks enable public institutions—schools, universities, hospitals, libraries, and community centres—to expand service delivery and bridge existing connectivity gaps.
  For underserved or rural communities, reliable high-performance Wi-Fi ensures:

  ✓ equitable access to online learning and digital educational resources,

  ✓ improved telemedicine capabilities, including remote diagnostics and specialist consultations,

  ✓ broader participation in e-government platforms and essential digital services. These outcomes directly reinforce Croatia's national priorities in digital inclusion, equal opportunity, and regional cohesion.

- **Strengthening Croatia's Innovation Capacity and Industry 4.0 Transformation**: Full utilization of the 6 GHz band also positions Croatia to lead in next-generation digital innovation. The high throughput and low latency enabled by 6 GHz Wi-Fi support a broad range of advanced applications, including immersive AR/VR training environments, real-time telemedicine with enhanced imaging, smart manufacturing and robotics, and intelligent transportation and urban infrastructure systems.
  These capabilities are foundational to Croatia's Industry 4.0, smart city, and digital transformation agendas.

Conclusion

The 6 GHz band presents Croatia with a unique and forward-looking opportunity to accelerate its digital transformation, enhance national economic resilience, and position itself as a leader in progressive, innovation-driven spectrum policy within Europe. By enabling licence-exempt access to the entire 1200 MHz, authorizing AFC-controlled SP operations, and preserving flexible use for LPI and VLP devices, Croatia can establish a spectrum framework that is both technologically future-proof and socially inclusive.

This comprehensive approach will deliver substantial and measurable benefits. It will support multi-gigabit connectivity for homes, enterprises, and public institutions; extend affordable broadband to rural and underserved areas; and enable advanced use cases such as smart-city systems, Industry 4.0 applications, next-generation public services, and high-capacity digital infrastructure for education and healthcare. These gains will reinforce Croatia's competitiveness, attract investment, and stimulate a dynamic domestic innovation ecosystem.

[9] https://www.wi-fi.org/system/files/Economic_Value_of_Wi-Fi_Highlights_202305.pdf