

**COMMENTS OF THE WIRELESS INNOVATION FORUM ON THE INNOVATION,
SCIENCE AND ECONOMIC DEVELOPMENT (ISED) CANADA CONSULTATION ON
REPURPOSING THE 3800 MHZ SPECTRUM BAND¹**

The Wireless Innovation Forum (WInnForum) is a U.S. based international non-profit organization driving technology innovation in commercial, civil, and defense communications around the world. Forum members bring a broad base of experience in Software Defined Radio (SDR), Cognitive Radio (CR) and Dynamic Spectrum Access (DSA) technologies in diverse markets and at all levels of the wireless value chain to address emerging wireless communications requirements through enhanced value, reduced total life cost of ownership, and accelerated deployment of standardized families of products, technologies, and services. In 2014, the WInnForum created a Spectrum Sharing Committee focused on implementing the U.S. Federal Communications Commission's regulations for three-tiered spectrum sharing in the 3550-3700 MHz (CBRS) band. The Committee presently has broad participation from over 65 organizational stakeholders in the new 3.5 GHz band, including wireless operators, Spectrum Access System developers, equipment manufacturers, satellite operators, Wireless Internet Service Providers (WISPs), utilities, Communications Research Centre Canada (CRC), The US National Institute of Standards and Technology (NIST), MITRE, The US NTIA Institute for Telecommunication Sciences, and others. Through this Committee, these members of the WInnForum collaborated with guest representatives from the US Defence Information Systems Agency, the DoD CIO, the US Navy and other government agencies to develop a suite of 10 baseline standards as follows:

- WINNF-TS-0112 CBRS Operational and Functional Requirements
- WINNF-TS-0065 CBRS Communications Security Technical Specification
- WINNF-TS-0071 CBRS Operational Security Technical Specification
- WINNF-TS-0016 SAS to CBSD Protocol Specification

¹ *Canada Gazette*, Part 1, August 2020, "Consultation on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band", SLPB-002-20

- WINNF-TS-0096 SAS to SAS Protocol Specification
- WINNF-TS-0061 SAS Test and Certification Specification
- WINNF-TS-0245 PAL Database Specification
- WINNF-TS-0022 CBRS PKI Certificate Policy
- WINNF-TS-0122 CBSD Test and Certification Specification
- WINNF-TS-0247 CPI Accreditation Standard

These standards are all publicly available and can be found here:

<https://cbrs.wirelessinnovation.org/winnforum-cbrs-knowledge-base>

WInnForum notes that ISED is seeking comments on its proposal to displace the existing Wireless Broadband Service (WBS) licensees from 3650-3700 MHz and designate 80 MHz of spectrum available for the development of a new shared licensing process in the 3900-3980 MHz band to allow use cases such as:

- fixed wireless access systems to provide faster Internet speeds in rural, remote, and northern communities, including indigenous communities
- private networks to support vertical industries such as industrial automation (e.g. farming, manufacturing, mining)
- private broadband networks on enterprise campuses (e.g. universities/colleges, stadiums, shopping centres, office buildings, etc.)

Specifically, ISED is seeking comments on the type of shared licensing process (e.g. database approach, licensee to licensee coordination) it should consider for that 3900-3980 MHz range.

While the WInnForum does not have detailed comments, we do offer the following general comments that apply to that range.

Technology and Service Neutrality

The WInnForum advocates for technology and service neutrality across the band to enable innovative and efficient use of spectrum. The WInnForum believes that increased neutrality with

respect to the specific uses of licensed spectrum results in increased innovation in wireless applications.

In addition, the WINNForum advocates allocating spectrum with licenses adapted towards a spectrum usage rights method that has the minimum necessary technical restrictions to provide adequate protection against harmful interference. Optimal use of radio spectrum is more likely to be secured if the market, and not the regulator, decides what technology or service should be provided in a particular frequency band. The increase in users' flexibility and ability to respond faster to changing market and deployment conditions will enhance the ability to increase spectrum usage efficiency. Licenses should not necessarily restrict the technology or application.

Spectrum Access Databases

The WINNForum advocates the unified active management of spectrum (terrestrial / air / space / maritime) to maximize spectrum utilization. The use of spectrum access databases is one important tool to enable increased sharing and thereby increase the dynamic nature of spectrum management.

The WINNForum strongly supports the use of networked and synchronized databases accessed with device location information. These databases have emerged as a critical technology for enabling and managing spectrum access.

Basing management and policy decisions in networked and synchronized databases allows regulations and services to adapt over time and vary by band while protecting incumbent users. Networked databases provide access to information beyond what is immediately observable by a radio, thereby mitigating hidden node problems in spectrum sharing scenarios. They provide a simpler mechanism for managing upgrades to spectrum management and dynamic access schemes by updating rules in a small set of databases rather than in millions of individual radios.

Furthermore, this approach has additional foreseeable benefits in that it starts the community down a path towards gathering real-time spectrum information and awareness from many distributed users, thereby helping to achieve the real-time spectrum dashboard vision endorsed by the Forum. It also simplifies the integration and application of non-spectrum domain information into spectrum management decisions, and such a solution should scale well over time. Databases could be made an integral part of a coexistence architecture given their visibility into the locations and operational states of many different radios from disparate wireless networks. Such a solution would need relatively rapid database responsiveness to account for changing environmental conditions. This could be helped by adopting a hierarchical architecture of databases with local caching.

However, the WINNForum notes that managing spectrum access in such a manner should account for the following considerations:

- The possibility of a catastrophic single-point of failure implies that the system should have redundancies built in.
- The possibility of disparate information leading to conflicting and potentially difficult to trace decisions means that these multiple redundant databases should be well-synchronized.
- Spectrum sharing systems leveraging networked databases have a greater need for secure communications and authentication due to the potential for impacting a large number of systems.
- Further, as with all databases, there exists the possibility of incomplete or erroneous information.

Thus, there is value to incorporating fail-safe mechanisms, such as spectrum sensing, which could provide a mechanism for assessing the presence of protected users independently of databases.

The WinnForum welcomes the opportunity to provide these inputs to ISED as they seek information on the technical and policy framework for the 3650-4200 MHz band to accommodate flexible use for fixed and mobile services and looks forward to continuing the discussion with ISED.

Respectfully submitted,

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