



Upcoming Spectrum Releases in Canada

DSA Global Summit June 2021

Spectrum Outlook 2018-22

Subset of priority 1 bands in the <u>Spectrum Outlook</u>

	3500 MHz	26 GHz
600 MHz auction completed	3800 MHz	28 GHz
	6 GHz	37-40 GHz

Low Band Mid Band High Band

TVWS in Canada-timeline

Consultation

ISED **held a consultation** to propose the introduction of white space technology as a new application of wireless telecommunications in Canada.

TVWS Rules

Since 2015, rules have been in place for white space systems, allowing for opportunistic use of over-the-air TV broadcast spectrum to enable services such as rural broadband.

Decision on Updates

A decision on the updates to the technical and policy framework for white space devices

Active TWWS Ecosystem

RED Technologies is <u>designated by</u>
<u>ISED</u> to operate a white space database in Canada. ISED has certified TVWS devices interoperable with this database.

Updating technical rules, which includes the operation of Mobile White Space Devices (WSDs) within geo-fenced areas, the operation of Narrowband WSDs, Fixed WSDs operating with an e.i.r.p. level of 16 W have been permitted in less congested areas.

2012

The white space regulatory framework was established

(allowed white space devices to operate on a licence-exempt basis in specific portions of the broadcasting frequency bands, namely 54-60 MHz, 76-88 MHz and 174-216 MHz, 470- 608 and 614-698 MHz)

Regulatory Framework

ISED designated a WSDBA in Nov 2017 November 2017: Consultation to update the regulatory framework

In the Consultation, ISED proposed updating the framework for white space devices to allow additional access to spectrum in the TV portions of the spectrum while eliminating access to the repurposed commercial mobile spectrum in the 600 MHz band

Updating the Framework

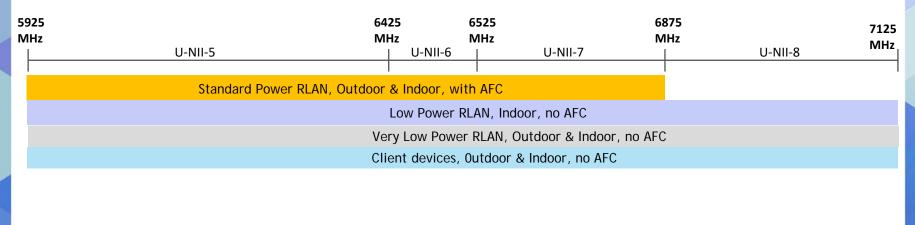
2020

In January 2020, ISED updated the technical rules to reflect the decisions made in 2019. The revisions includes changes that reflect ongoing improvement in the characteristics of white space technology, while also ensuring appropriate protection for licensed systems.

Updating Technical Rules

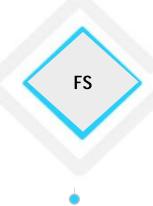
6 GHz (5925-7125 MHz) for LE RLANs

- Consultation Nov 2020
- <u>Decision</u> May 19, 2021



- Standard Power AP (36 dBm EIRP, PSD of 23 dBm/MHz)
- Low Power AP (30 dBm EIRP, PSD of 5 dBm/MHz)
- Very Low Power AP (14 dBm EIRP, PSD of -8 dBm/MHz)
- Client Devices Under AP Control (Power limited to 6 dB below limit of its associated AP)
- Technical rules: <u>Consultation</u> underway for low-power devices, rest to follow

Standard Power RLANs: Protecting incumbents



Fixed Service

Use AFC system
Exclusion zones to protect
fixed links
AFC determines
permissible frequencies
and power for operation of
license-exempt devices



Fixed-Satellite Service

Restrict antenna elevation angles from pointing upward for outdoor devices, including power limit of 125 mW e.i.r.p. above 30 degrees (vertical elevation mask).



Broadcast Auxiliary Service

Standard power outdoor not allowed on overlapping frequencies



Radio Astronomy

Exclusion zone managed by the AFC

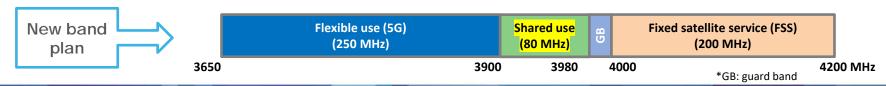
3800 MHz Band

On May 21, 2021, ISED released the **Decision on the Technical and Policy Framework for the 3650-4200 MHz Band and Changes to the Frequency Allocation of the 3500-3650 MHz Band** (the 3800 MHz Decision)

- Current uses include:
 - Wireless Broadband Services (WBS)
 - Downlink earth stations for FSS in C-band, both licensed and licence-exempt

Key Decisions

- Make a total of 330 MHz of spectrum available for 5G services with 20 MHz guard band
- Move satellite services from 3700-4200 MHz to 4000-4200 MHz, except in "satellite-dependent areas" where satellite services will be able to continue using full 500 MHz in remote and northern communities
- Displace WBS from 3650-3700 MHz and make 3900-3980 MHz available for shared use
- Transition Timing:
 - FSS to transition by March 2025
 - WBS to transition by March 2025 in urban areas, and March 2027 in rural areas on Tier 5 basis



Shared Use in 3900 MHz band

- The 3800 MHz Decision designated 80 MHz for shared use in 3900 MHz band (3900-3980 MHz)
- Response to current WBS licensees like rural WISPS needs for more spectrum to meet demands of their customers
 - WBS licensed on all-come, all-served basis
 - Coordination required among licensees in given licence area (i.e. Tier 4 area)
 - In highly congested areas, licensees cannot use full 50 MHz of WBS spectrum (3650-3700)
 - Current WBS licensees mainly using older technologies (e.g. WiMAX)
- New 3900 MHz band will provide 30 MHz of additional spectrum for rural WISPS for total of 80 MHz (up from 50 MHz)
- Allow users to provide services using 5G equipment
- Intended for private networks, vertical industries, industrial users like mines, utilities and factories, rural WISPs and other new 5G uses
- ISED will consult on new licensing process in future
 - Including licensing approach, licence area, conditions of licence, etc.

Foundational Work - Spectrum Sharing

Foundational requirements for spectrum sharing and evolving needs	Activity
Access to high quality incumbent data	 Examining new datasets and improvements to existing incumbent data required to support spectrum sharing
Regulatory technology and processes are current	 Enhancing regulatory processes and technology - cloud computing, spectrum monitoring, etc to support new and emerging needs of spectrum users
Ensuring legal and regulatory framework can support current and future forms of spectrum sharing	 Reviewing the legal and regulatory framework to ensure it is DSA-ready and future-proof
Right business case for all stakeholders	 Considering the potential business case for database operators and equipment vendors, and potentially new spectrum users in Canada

REVIEWING OUR REGULATORY ENVIRONMENT TO IDENTIFY ANY IMPROVEMENTS/TWEAKS, IF NEEDED, FOR ENABLING DYNAMIC SPECTRUM SHARING

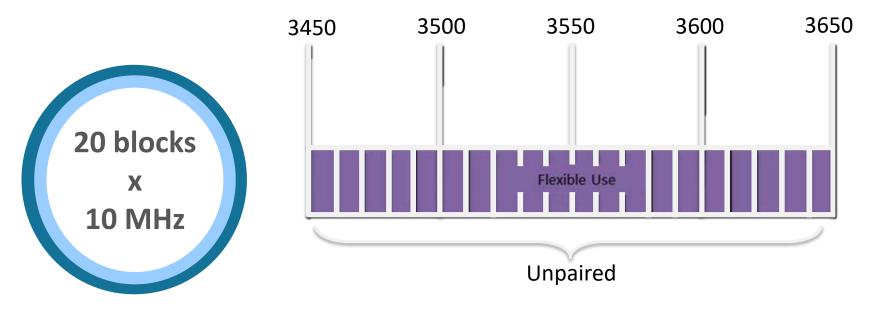
Recommendations related to spectrum sharing in the broadcasting and telecom legislative review to improve the related legislative tools

Examining opportunities for automated spectrum management for ensuring high data quality and leveraging complementary datasets to support DSA and local licensing mechanisms

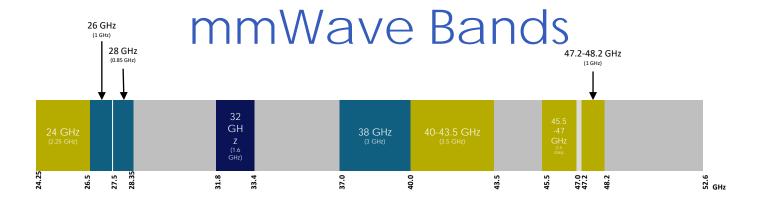
LEGAL FRAMEWORK

SOFTWARE REQUIREMENTS

3500 MHz Auction for 5G Flexible Use



The auction will begin on **June 15**th, **2021**.





- mmWave 1 64-71 GHz available now for LE and 2024 for auction bands
- Potential mmWave 2 likely after 2024
- Backhaul available now
- Other use

Timing based on Outlook and amounts of mmWave 2 based on WRC-19

Summary

- Spectrum Outlook 2018-22 that addresses priorities for low band, mid band and high band spectrum
- Database-driven spectrum sharing introduced in two bands to allow licence-exempt shared use with incumbents
 - Active TVWS ecosystem in Canada as of April 2021
 - 6 GHz band decision May 2021
- 3900-3980 MHz shared use of the band mechanism to be determined
- Reviewing our regulatory environment to identify any improvements, if needed, for enabling dynamic spectrum sharing and automated spectrum management
- 3500 MHz, 3800 MHz, 26 GHz, 28 GHz and 37 GHz bands via auction

