



WWRF Huddle

Session 7: Spectrum Allocation and Regulatory Challenges A Canadian Perspective

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Spectrum landscape for licensed flex use



Many frequency bands are flexible use - allow mobile, fixed, and fixed wireless access (FWA)

1168 MHz of spectrum over 11 frequency bands currently available. New 5G deployment underway in multiple bands (e.g. 600 MHz, 2500 MHz, 3500 MHz, 3800 MHz and 3900 MHz)

ISED rules are generally technology neutral; flex use bands can use LTE, 5G or any technology that meets technical rules

Traditionally auctioned, but now alternate models (e.g. Non-Competitive Local Licensing (NCLL); Access Licensing)

Demand for private networks has increased since many Canadian industries (e.g. mines, transportation, oil & gas) are seeing benefits for productivity, safety and security

Licence exempt spectrum equally meaningful



Dynamic Spectrum Access

- TV Whitespace with 2 database administrators
- 6 GHz with 4 recognized AFC database administrators and 2000+ certified devices

Other licence exempt bands include 902-928 MHz, 2.4 GHz, 5 GHz, 60 GHz, Above 95 GHz

- Licence exempt devices (e.g. Bluetooth, Wi-Fi, IoT, wearables (e.g. smart watches, smart glasses, VR headsets, etc.)) account for the vast share of product certification for the Canadian market

**Complement
to licensed
networks**

Technology and network changes

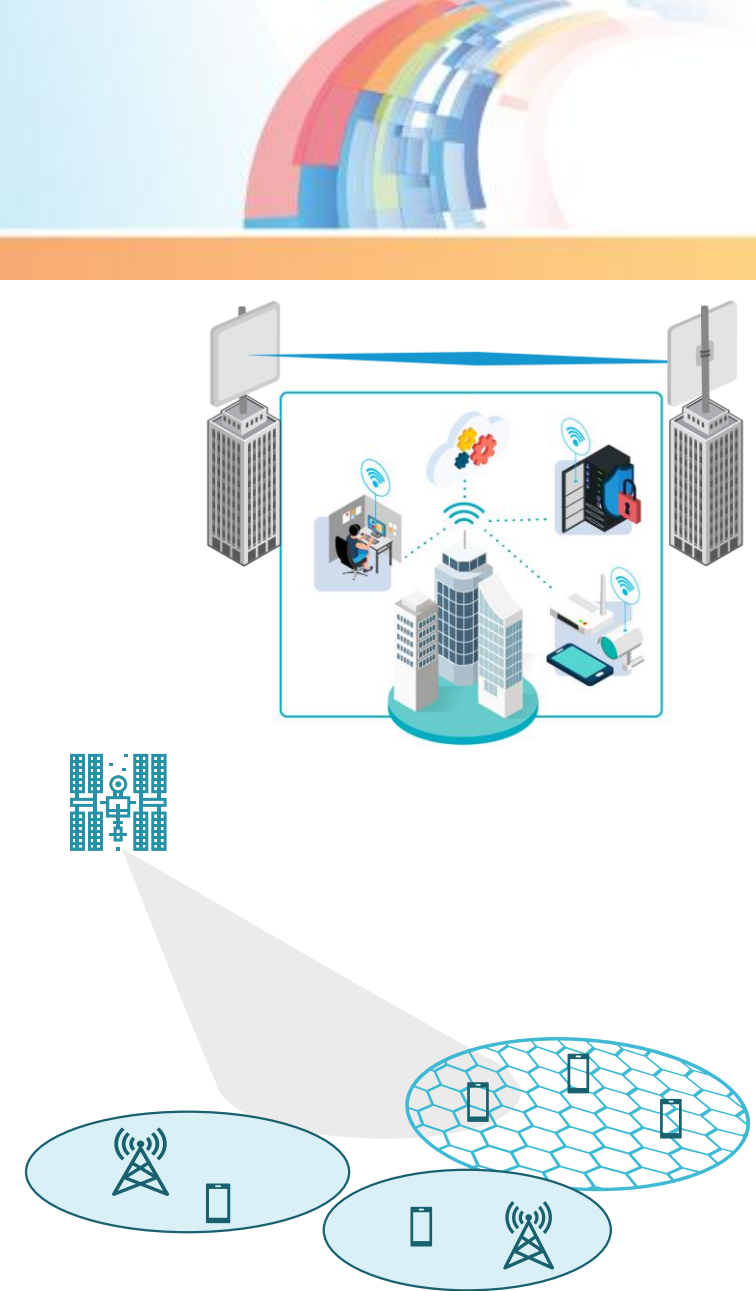
- Most equipment is multi-band and operators are taking advantage of it, including carrier aggregation

Example:

- WISPs using a combination of 5 and 6 GHz Licence-Exempt, with 60 GHz Fixed Links with 3.9 GHz local licensed and other mid or low band licensed spectrum to provide the various services to rural communities
- Opportunities for multiple services in one network

Example: Recent decision on Supplemental Mobile Coverage by Satellite (SMCS)

 - Satellite coverage is great for Canada given its challenging topography
 - Unlike the U.S. or Europe, we don't have many bands where our operators have national licences
 - In the past we may have just said “no”



ISED's Regulatory Role and Spectrum Sharing



To balance efficient use of spectrum for all services and users, for social and economic benefit of citizens, including public safety/security

- Sharing has been around forever, but need to rethink how we manage sharing and what is possible where
- Clearing bands is very difficult politically, and costly for stakeholders even when technologies are ramping down
- No more “greenfield” spectrum
- New technologies, applications, business models, and players
- We are revisiting some of legacy approaches where it makes the most sense

What does this mean for international allocations and regulation?



National regulators can be more nimble on sharing studies and coexistence rules, implementing innovative authorization models, or adopting licence-exempt spectrum to accommodate new use cases and players



ITU-R and WRCs have been following the same game plan for IMT identification from the beginning, to great success for innovation and services, but we need to adjust



- Sharing should be built into the thinking
- Getting timing right - Some bands identified too early or have such tight restrictions that value is questionable
- Greater transparency in identification of bands for study under future AI's
- How we define a successful WRC



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Canada



THANK YOU



List of flexible use bands in Canada

Low Band



Band	Frequency range		Amount of spectrum	Licensing type - Date
600 MHz	617-652 MHz	663-698 MHz	70 MHz	Auctioned - 2019
700 MHz	698-716 MHz	728-746 MHz	68 MHz	Auctioned - 2015
	777- 787 MHz	746-756 MHz		
	716-728 MHz			
800 MHz cellular	824-849 MHz	869-894 MHz	50 MHz	Licenced - 1983
900 MHz (new)	897.5-900.5 MHz	936.5-939.5 MHz	6 MHz	Site-based licensing in rural - 2023

Mid Band



Band	Frequency range		Amount of spectrum	Licensing type - Date
Advanced wireless services (AWS)-1	1710-1755 MHz	2110-2155 MHz	90 MHz	Auctioned - 2008
AWS-3	1755-1780 MHz	2155-2180 MHz	50 MHz	Auctioned - 2015
AWS-4	2000-2020 MHz	2180-2200 MHz	40 MHz	Licensed - 2015
Personal communication systems (PCS)	1850-1915 MHz	1930-1995 MHz	130 MHz	Auctioned - 2001
Wireless communication services (WCS)	2305-2320 MHz	2345-2360 MHz	30 MHz	Auctioned - 2004
2500 MHz	2500-2570 MHz	2620-2690 MHz	140 MHz	Auctioned - 2015
	2570-2620 MHz		50 MHz	Auctioned - 2015
3500 MHz TDD (new)	3450-3650 MHz		200 MHz	Auctioned - 2021
3800 MHz TDD (new)	3650-3900 MHz		250 MHz	Auctioned – 2023
3900 MHz TDD (new)	3900-3980 MHz		80 MHz	Local licensing - 2025

High Band



Band	Frequency range	Amount of spectrum	Licensing type - Date
Lower 26 GHz (proposed)	24.25-25.1 GHz	0.85 GHz	Local licensing - TBD
Upper 26 GHz (proposed)	25.1-27.5 GHz	2.4 GHz	Auction - TBD
28 GHz (new)	27.5-28.35 GHz	0.85 GHz	Local licensing
38 GHz (proposed)	37.6-40 GHz	2.4 GHz	Auction - TBD