

BECOMING 5G-ADVANCED:

the 3GPP 2025 Roadmap



Presentation Slides

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The work done by 3GPP in Release 17 improved 5G New Radio (NR) by adding support for new services, reduced-capability user equipment, non-terrestrial networks, frequency bands beyond 52GHz, and the multicast and broadcast service (MBS).

He further added, “The next few years will see initial work on Release18, the 5G-Advanced standard, which will offer a boost to network performance and create even more opportunities.”

Chris Pearson, President, 5G Americas



3GPP Rel-18 sets off the 5G Advanced Evolution.



Release 18

3GPP Release 18 sets off the 5G Advanced Evolution

Approved package has a wide range of projects – nominal work to start in Q2 2022

Strengthen the end-to-end 5G system foundation



Advanced DL/UL MIMO



Enhanced mobility



Mobile IAB, smart repeater



Evolved duplexing



AI/ML data-driven designs



Green networks

Proliferate 5G to virtually all devices and use cases



Boundless extended reality



NR-Light (RedCap) evolution



Expanded sidelink



Expanded positioning



Drones & expanded satellites comm.



Multicast & other enhancements

Ongoing Release timelines (March 2022)

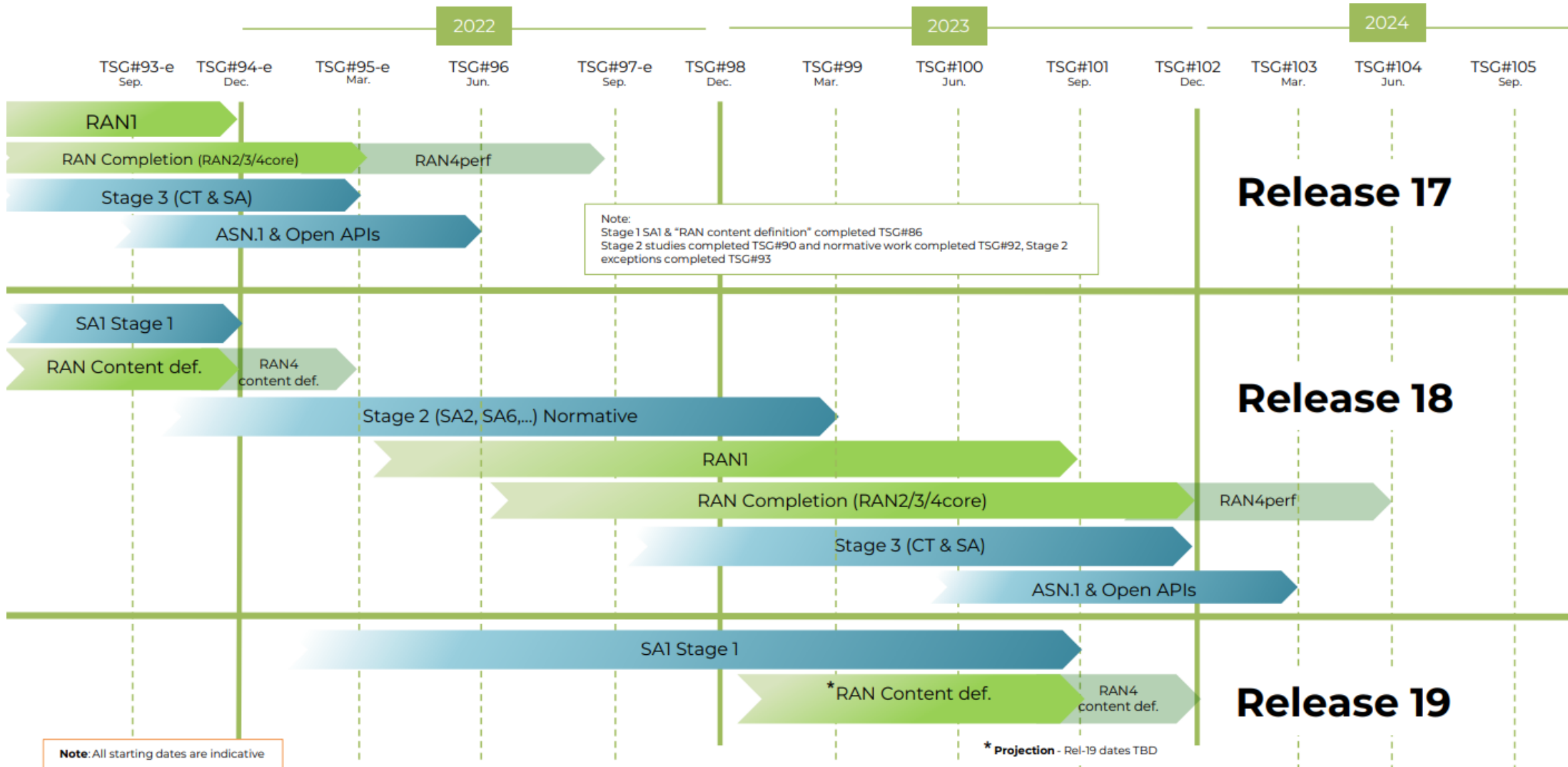
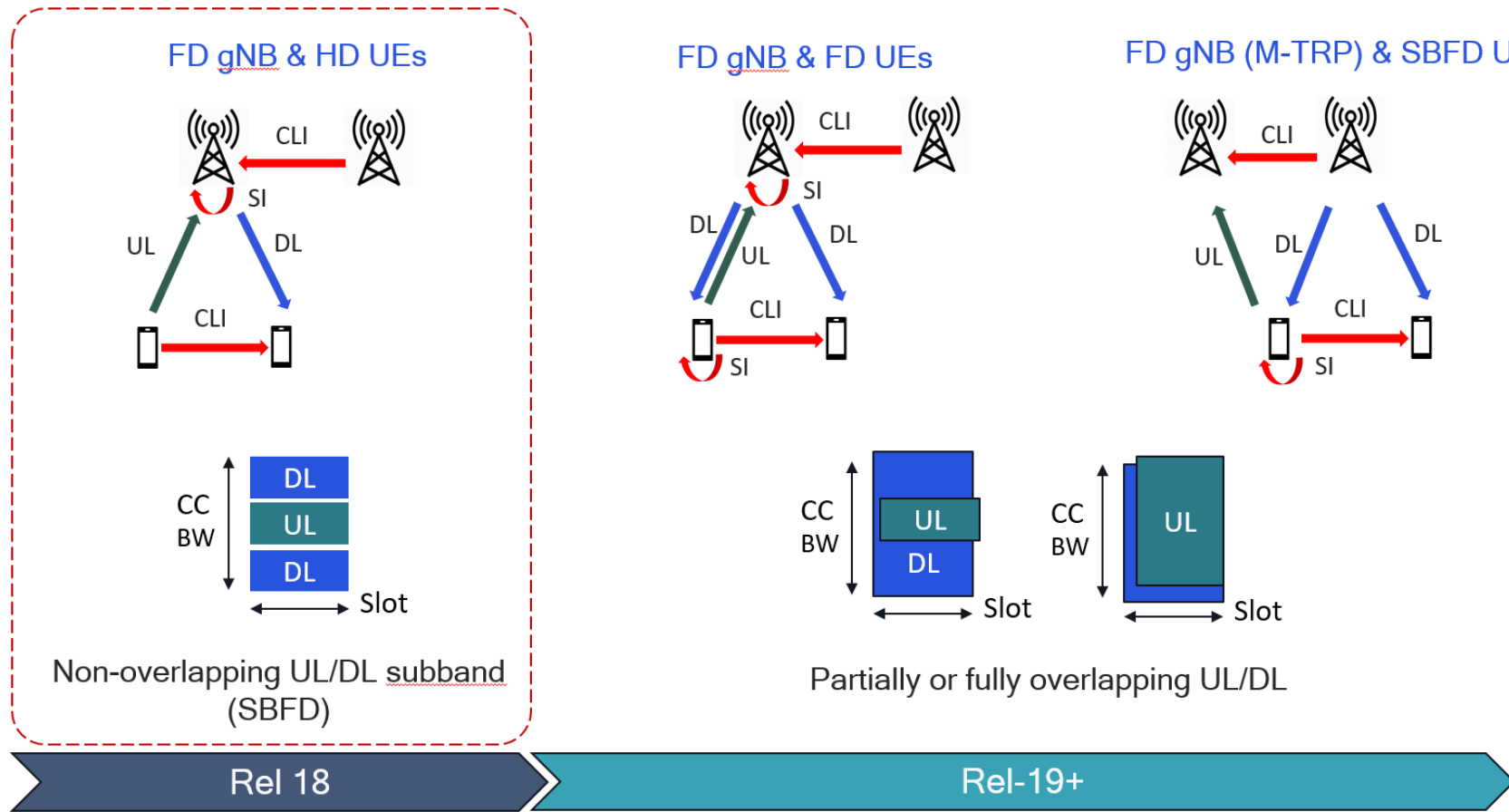


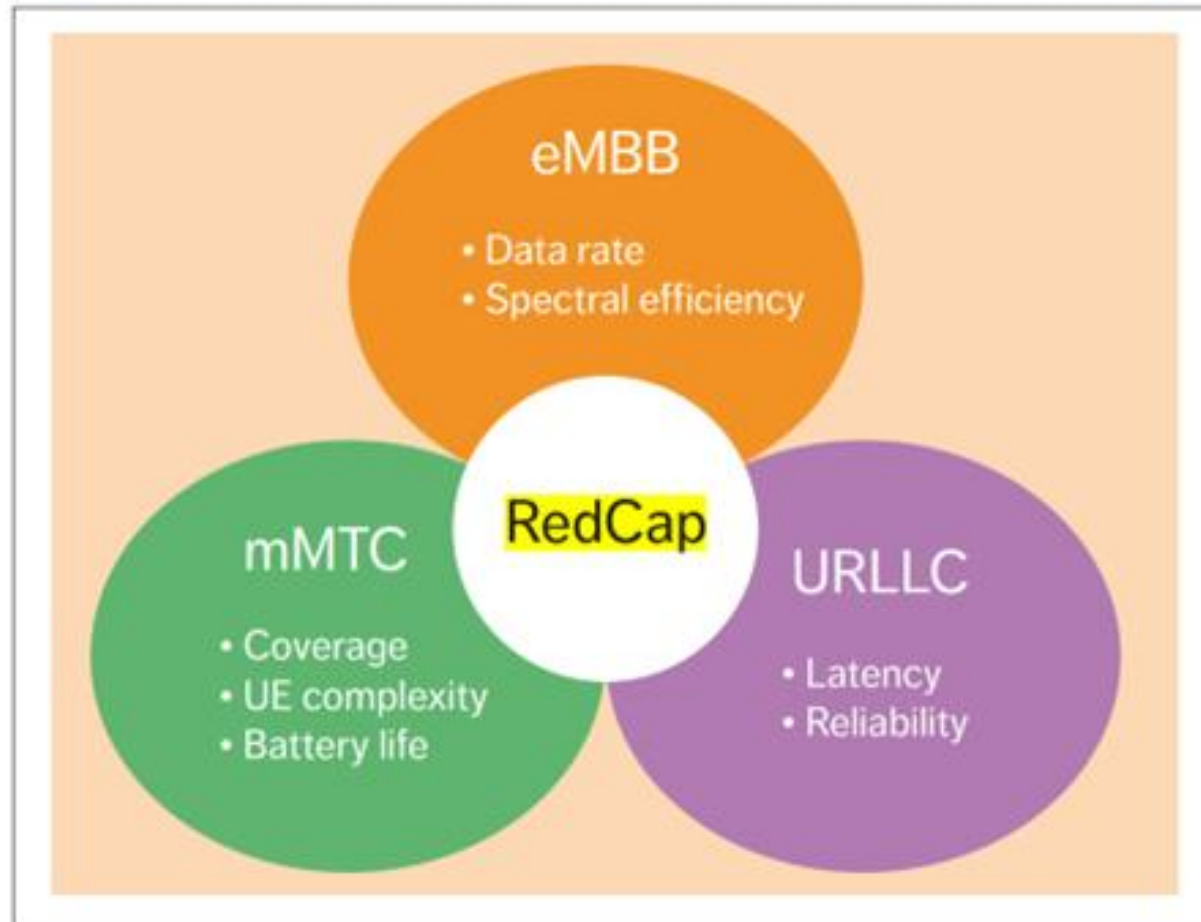
Illustration of the concept of SBFD comparing with FDD/TDD

Road map to evolution of full duplex technologies



Scenarios for UE-to-Network Relay

Release 17 RedCap targets the requirement space between eMBB, URLLC and mMTC



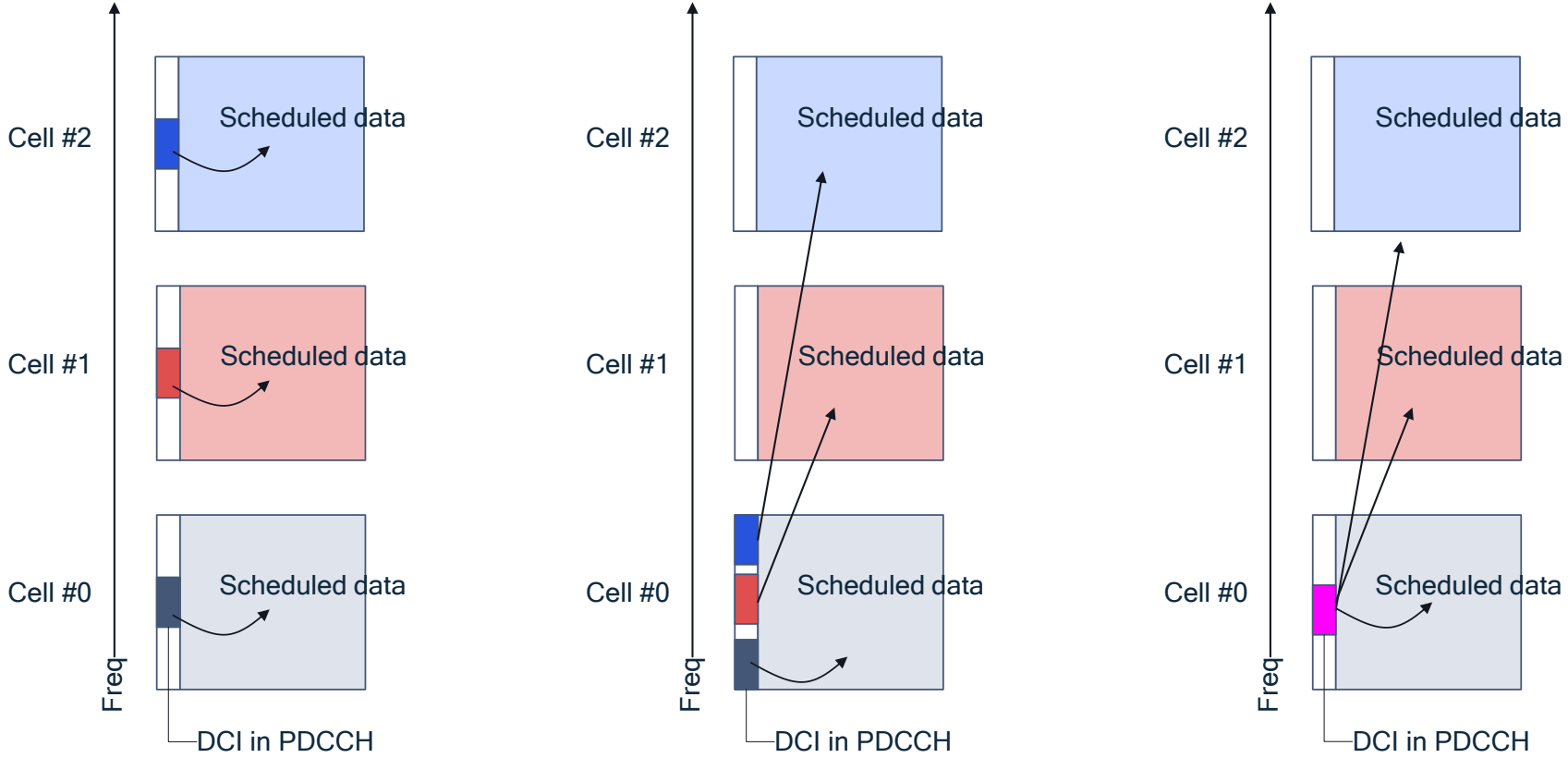
Requirements of wearables, industrial wireless sensors, and video surveillance use cases

	Data rate	Latency	Availability/ reliability	Battery lifetime	Device size
Wearables	5-50Mbps DL, 2-5 Mbps UL	Relaxed	N/A	up to 1-2 weeks	Compact form factor
Industrial wireless sensors	< 2Mbps	<100ms	99.99%	At least a few years	N/A
Video surveillance	2-4 Mbps for economic video, 7.5-25 Mbps for high- end video	<500ms	99% - 99.9%	N/A	N/A

Comparison of device capabilities

	R15/16 NR EMBB	R17 NR REDCAP	R18 NR REDCAP (EXPECTED)	LTE-M (CAT M1)	NB-IOT (CAT NB1)
UE BW	100MHz (FR1), 200MHz (FR2)	20MHz (FR1), 100MHz (FR2)	20MHz or 5MHz (FR1 only)	1.4 MHz	180 KHz
Duplex	FD-FDD, TDD	FD/HD-FDD, TDD	FD/HD-FDD, TDD	FD/HD-FDD, TDD	HD-FDD, TDD
UE Antenna	1T2R(FDD)/1T4R(TDD)	1T1R/1T2R	1T1R/1T2R	1T1R	1T1R
Max Modulation Order	256QAM for DL, 64QAM for UL	64QAM (256QAM optional)	64QAM (256QAM optional)	16QAM	QPSK
Peak Data Rate – DL	2.3 Gbps	220Mbps	10 Mbps	588 kbps	26 Kbps
Peak Data Rate – UL	468 Mbps	120Mbps	10 Mbps	1119 kbps	66 Kbps

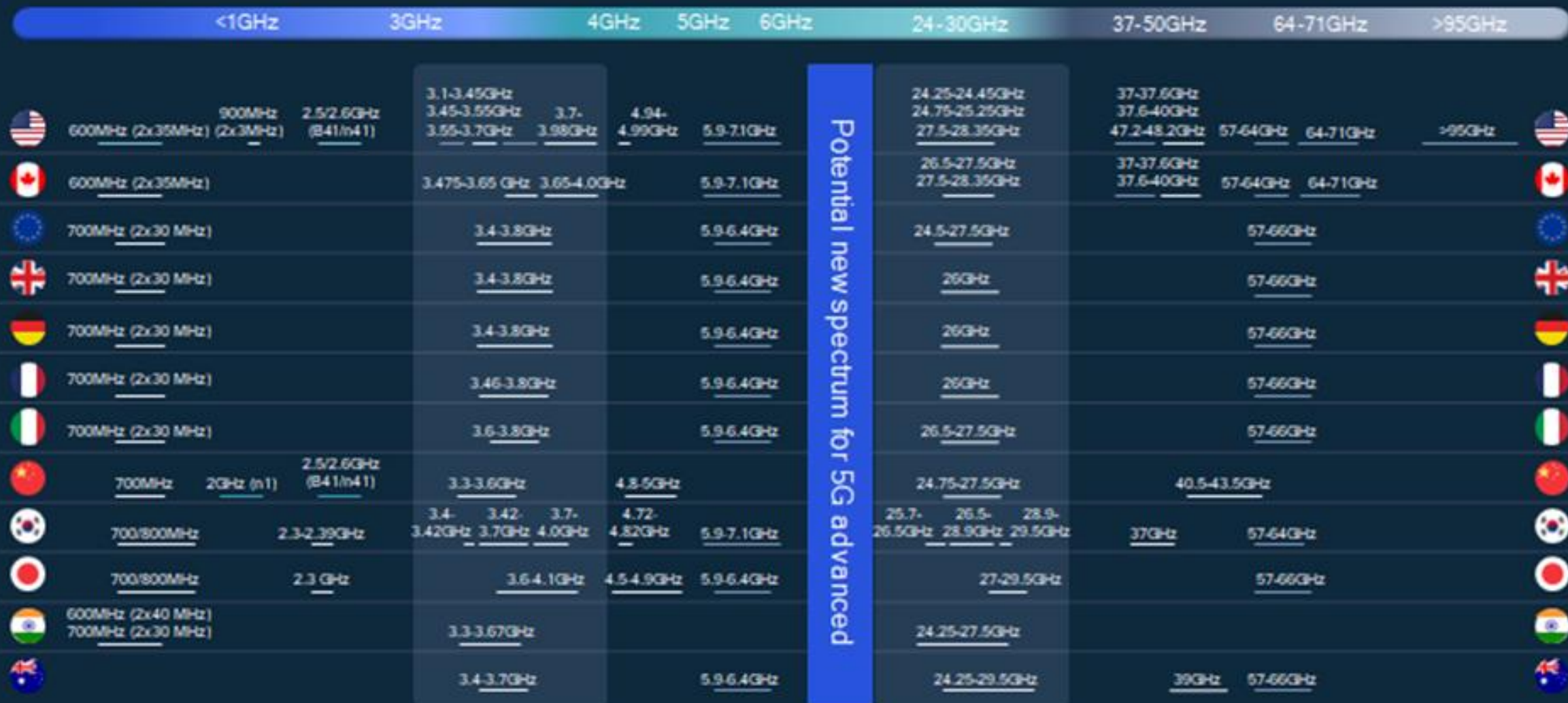
Self-scheduling, cross-carrier scheduling, and multi-cell scheduling



(a) Self-scheduling

(b) Cross-carrier scheduling

(c) Multi-cell scheduling



Potential new spectrum for 5G advanced

Global snapshot of allocated/targeted 5G spectrum

5G is being designed for diverse spectrum types/bands

- 5G band
- Licensed
- Unlicensed/shared
- Existing band

Note for Japan: All cellular bands are available for 5G; 5.9-6.4 GHz is in the final stage of regulatory process for the update expected in August 2022

