

mmWave solutions and opportunities

An aerial night view of a city, likely Singapore, with a large stadium in the center. The city is overlaid with a dense network of colorful, glowing lines in shades of green, blue, and purple, representing mmWave signals. The lines flow across the city, connecting various buildings and areas. In the background, a large body of water is visible with several ships and cranes along the waterfront.

Christopher Price

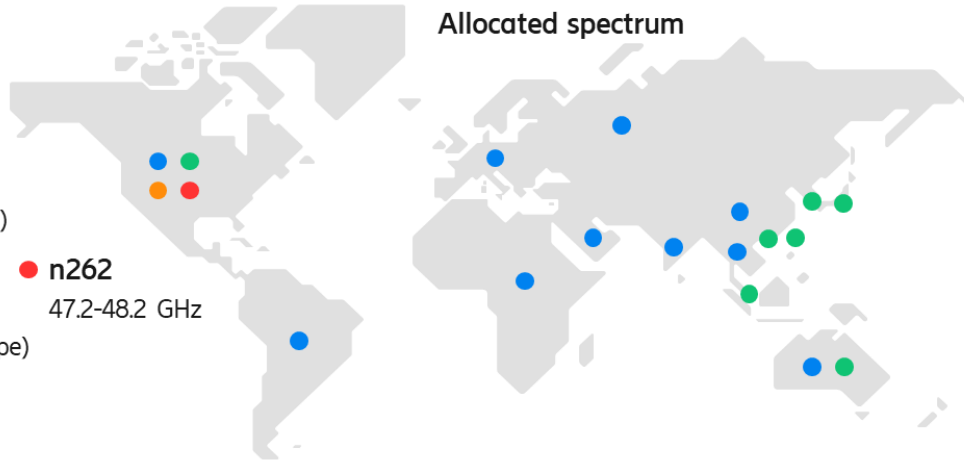
Ericsson
CTO Office, APAC Advanced Technologies

mmWave spectrum



June 2023 status

- **n258**
24.25-27.5 GHz
- **n257**
26.5-29.5 GHz
(n261 is a subset)
- **n260**
37.0-40.0 GHz
- **n259**
39.5-43.5 GHz
(planned in Europe)
- **n262**
47.2-48.2 GHz



Local spectrum

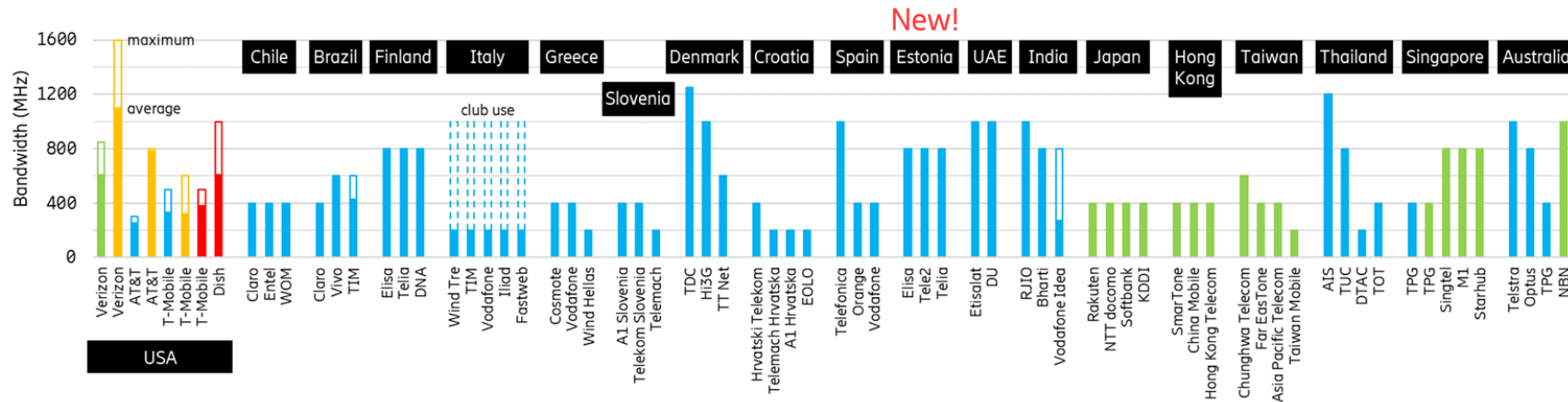
- Russia 24.25-24.65 GHz
 - UK 24.25-26.5 GHz**
 - Finland 24.25-25.1 GHz
 - Germany 24.25-27.5 GHz*
 - Denmark 24.25-24.65 GHz
 - Japan 28.2-29.1 GHz
 - Hong Kong 27.95-28.35 GHz
 - Australia 24.7-29.5 GHz*
 - Korea 28.9-29.5 GHz
 - Sweden 24.25-25.1 GHz**
 - Spain 24.25-24.7 GHz
- *Shared **Indoor

26 or 28 GHz
Global pioneering bands

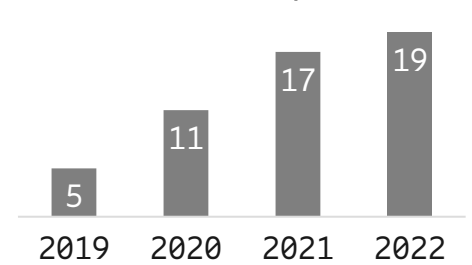
400-1000 MHz
Typical per operator

Local spectrum
Quite common

Operator spectrum licenses



Countries with awarded 5G mmWave spectrum



5G Fixed Wireless Access

An early commercial use of mmWave



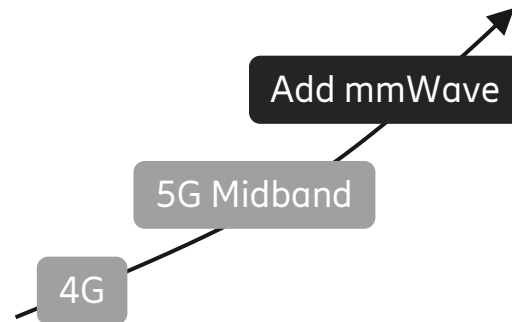
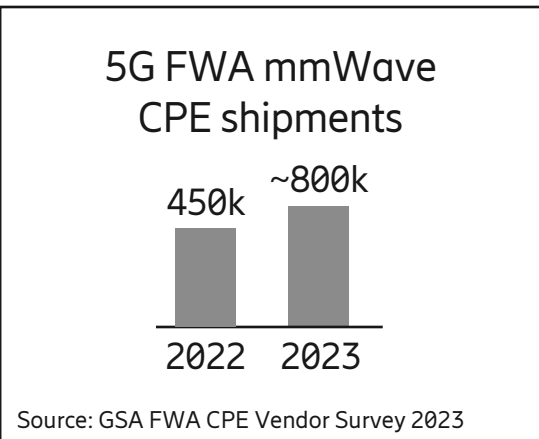
By 2028, FWA connections is forecasted to reach over 300 million

300M

Source: Ericsson Mobility Report (Jun. 2023)

mmWave for 5G FWA

wireless fiber capacity and speed in selected areas



5G FWA mmWave deployments

	2021	2022	2023	2024+
Verizon	[Deployment bar]			
Fastweb (Italy)	[Deployment bar]			
USCC	[Deployment bar]			
NBN (Australia)	[Deployment bar]			
Global interest	Explored for early mmWave use [Deployment bar]			

Verizon	5G Home Plus	Up to 1Gbps		
Complement to Midband 5G FWA (launched 2022)				
Fastweb	Casa FWA	Up to 1Gbps		
Fixed broadband provider				
USCC	Home Internet+	Up to 300Mbps		
Complement to Midband 5G FWA (to be launched 2023)				
NBN	Plan to add mmWave			
Large scale wholesale FWA provider				

Best prepared for new services and business



Early Adoption Industrial & Enterprise

- Reliable and secure replacement for wire and Wi-Fi
- Robotics and cloud control demands very high reliability at very low latency
- Flexible factory floor layout that allows mobile use with no interruptions
- Enhanced VR experience
- Uplink heavy traffic for video streams from multiple 8k 360 cameras during crowded events



URLLC capability for advanced automation
[Optus News](#)



Exploration in production indoor and outdoor



5G mmWave in our own production

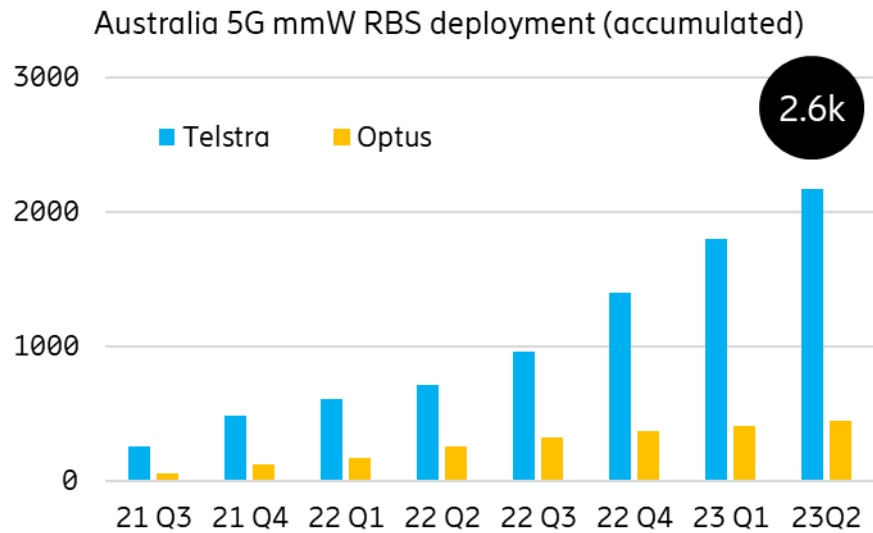


Enhanced VR experience in entertainment



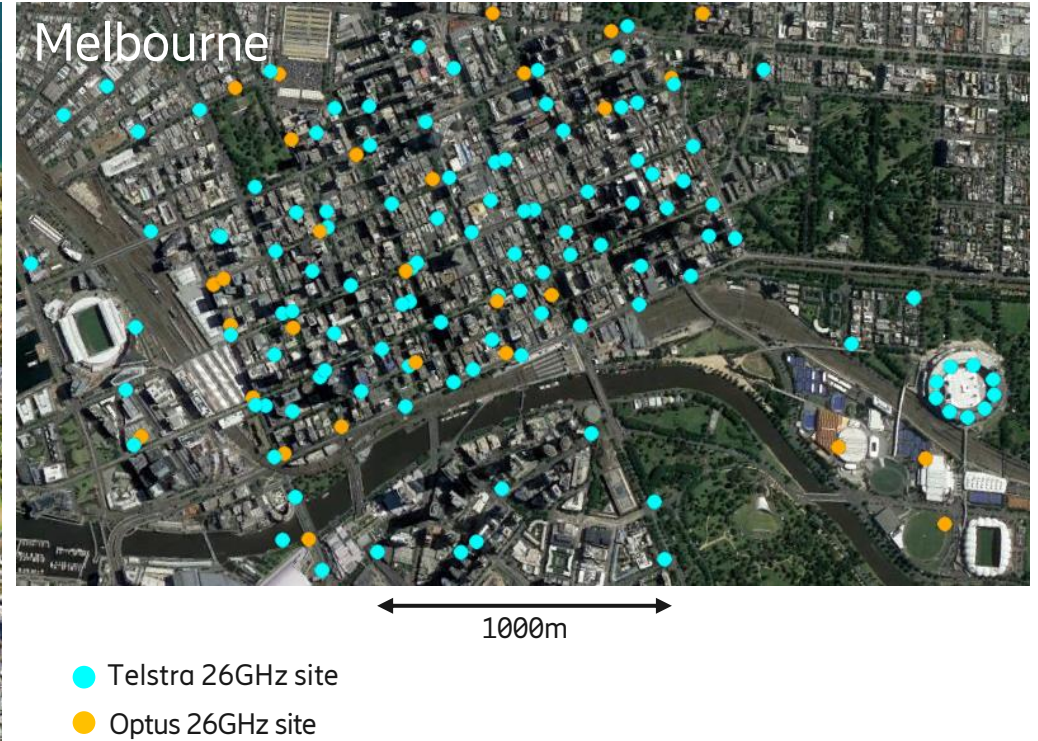
Media production 8k 360 degree

Australia



Source: Data from ACMA register of radiocommunications licenses

n258 aka 26GHz
Telstra 1000MHz
Optus 800MHz

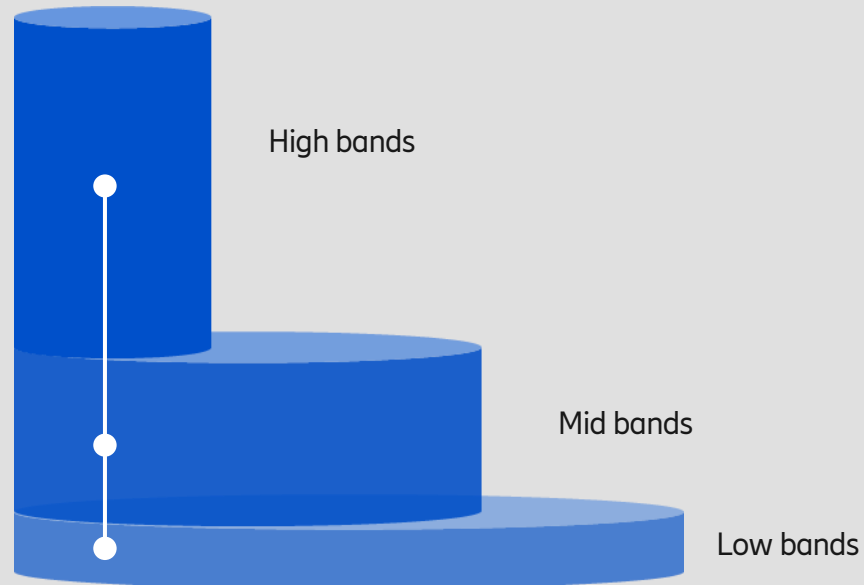


Source: Data from ACMA register of radiocommunications licenses

Aggregate bands, optimize performance



Higher throughput, higher reach, system and user level

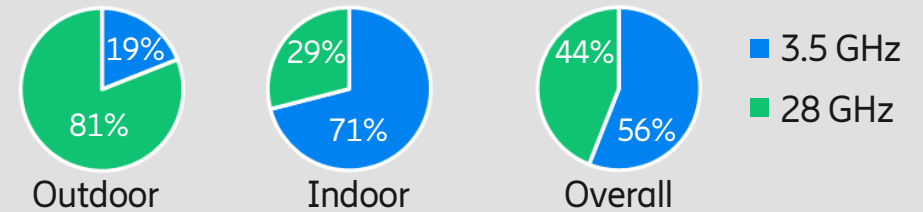


System simulation, 3.5 & 28 GHz, real NW data

150 m site-to-site distance,
21 m antenna height
3.5 & 28 GHz on all macro sites

100 MHz BW @ 3.5 GHz
800 MHz BW @ 28 GHz
70% of traffic indoors

Traffic distribution per band



Outdoor median speed

3.5 GHz only:	0.7 Gbps
3.5+28 GHz:	4.3 Gbps

Indoor speed @ 60%-tile

3.5 GHz only:	0.6 Gbps
3.5+28 GHz:	1.2 Gbps

High bands add significant throughput & capacity to 5G

