

# SPECTRUM

THE FUNDAMENTAL ELEMENT OF MOBILE



5G Trials and Launches

Mats Ohman

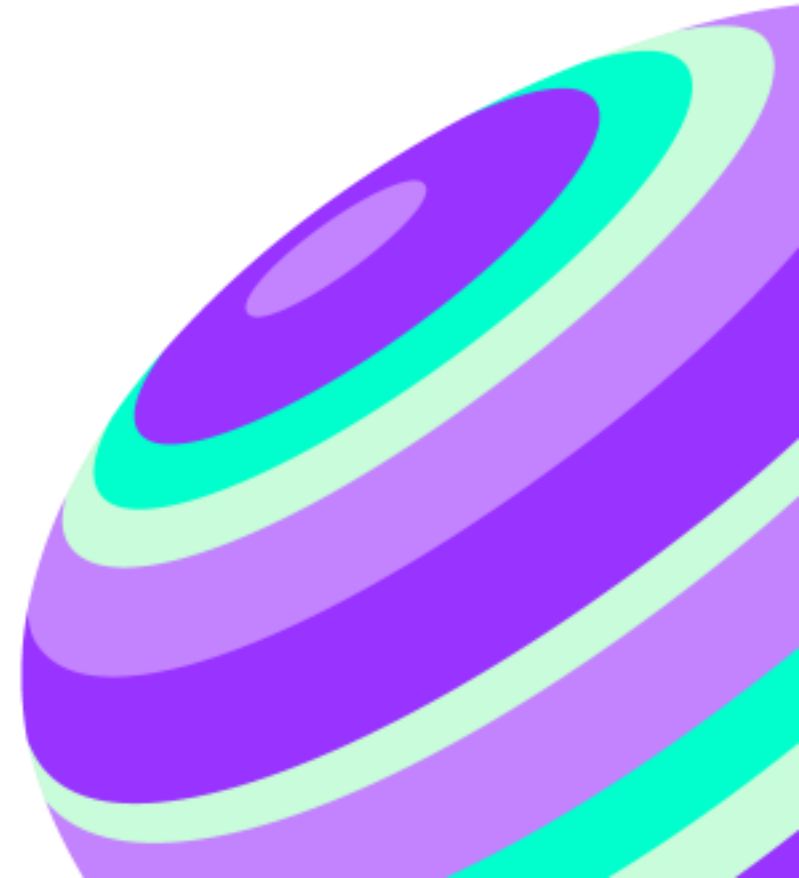




# 5G AND SPECTRUM NEEDS

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GSMA Seminar for CEPT  
WRC-19 Sharm el-Sheik

November 4, 2019





# BACKBONE STRUCTURE OF 5G



5G Success is not only about spectrum  
but it plays a key role



# ROLES OF DIFFERENT SPECTRUM RANGES

Unlicensed +  
5G licensed High & Mid-bands

~60% traffic

Ultra Experience Layer

5G licensed Mid-bands

~30% traffic

Capacity/Coverage Layer

5G licensed Low & Mid-bands

~10% traffic

Basic Coverage Layer



Frequency

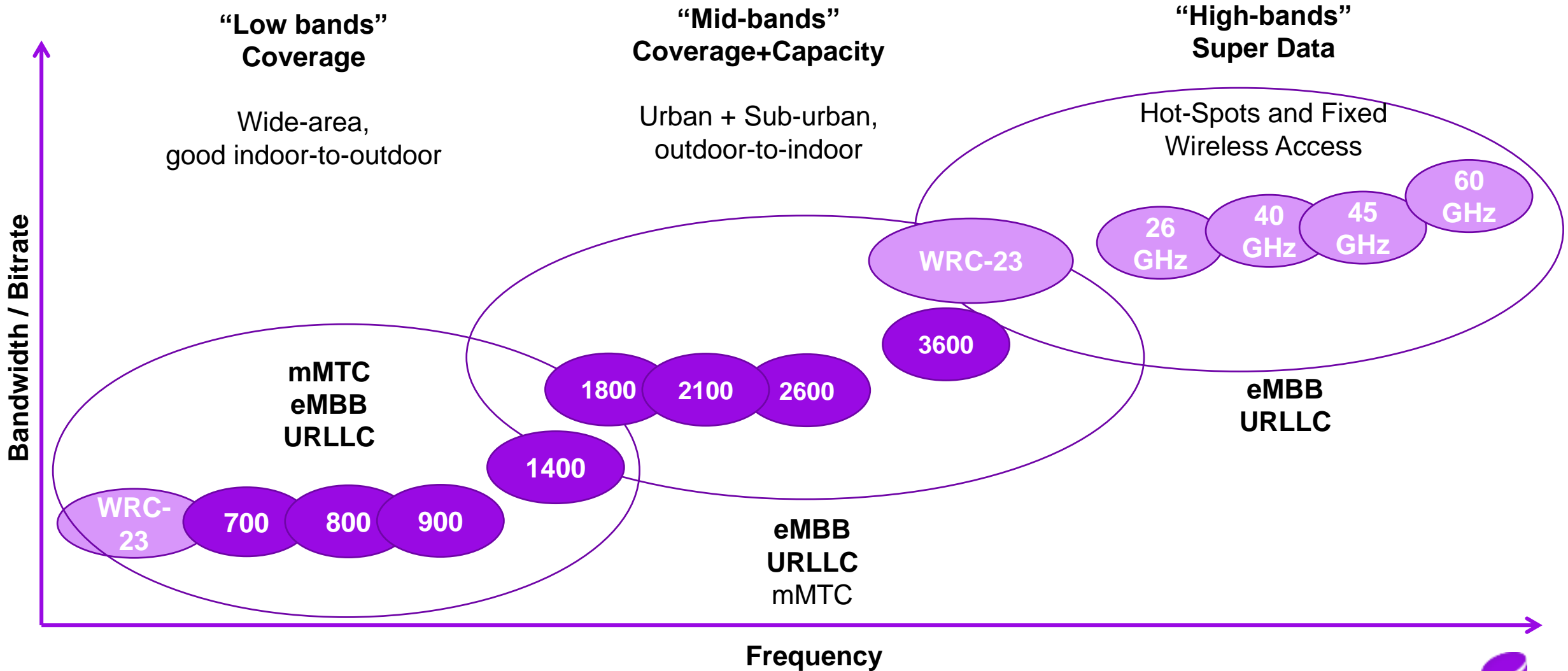
High-bands >24GHz  
Mid-Bands 2-8GHz

Mid-bands 2-8 GHz

Mid-bands 2-8 GHz  
Low-bands sub 2GHz



# SUFFICIENT SPECTRUM NEEDED IN ALL RANGES



- WHAT HAS TELIA DONE WITH 5G?

SEVERAL TRIALS IN MMWAVES AND MID-BANDS  
WITH VARIOUS PARTNERS

TELIA COMPANY PARTNERSHIP PROGRAM

COMMERCIAL LAUNCH IN FINLAND AND PLANS IN  
OTHER COUNTRIES PENDING ON SPECTRUM  
AVAILABILITY





# ABB ASSEMBLY LINE: 5G + AI + CLOUD



Real time quality assurance, low latency 5G connection, machine vision analytics running in datacenter





# VOLVO CONSTRUCTION EQUIPMENT FACILITY

## REMOTE-CONTROLLED MACHINES AND AUTONOMOUS SOLUTIONS



Public





# BOLIDEN MINE - 5G UNDERGROUND NETWORK



Sustainable mining -  
better safety and productivity  
with less CO2



# FACIAL PAYMENT OVER 5G

Fancy a top-quality ice-cream just showing your face for payment ?





# AND MANY MORE ...



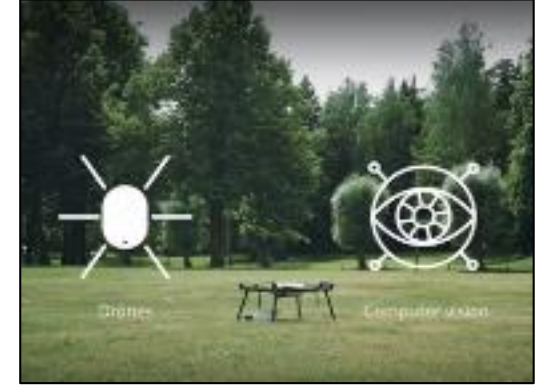
Airport robot



eSports



Forrest industry mill



Drone+video analytics



Movie theater



Virtual reality collaboration



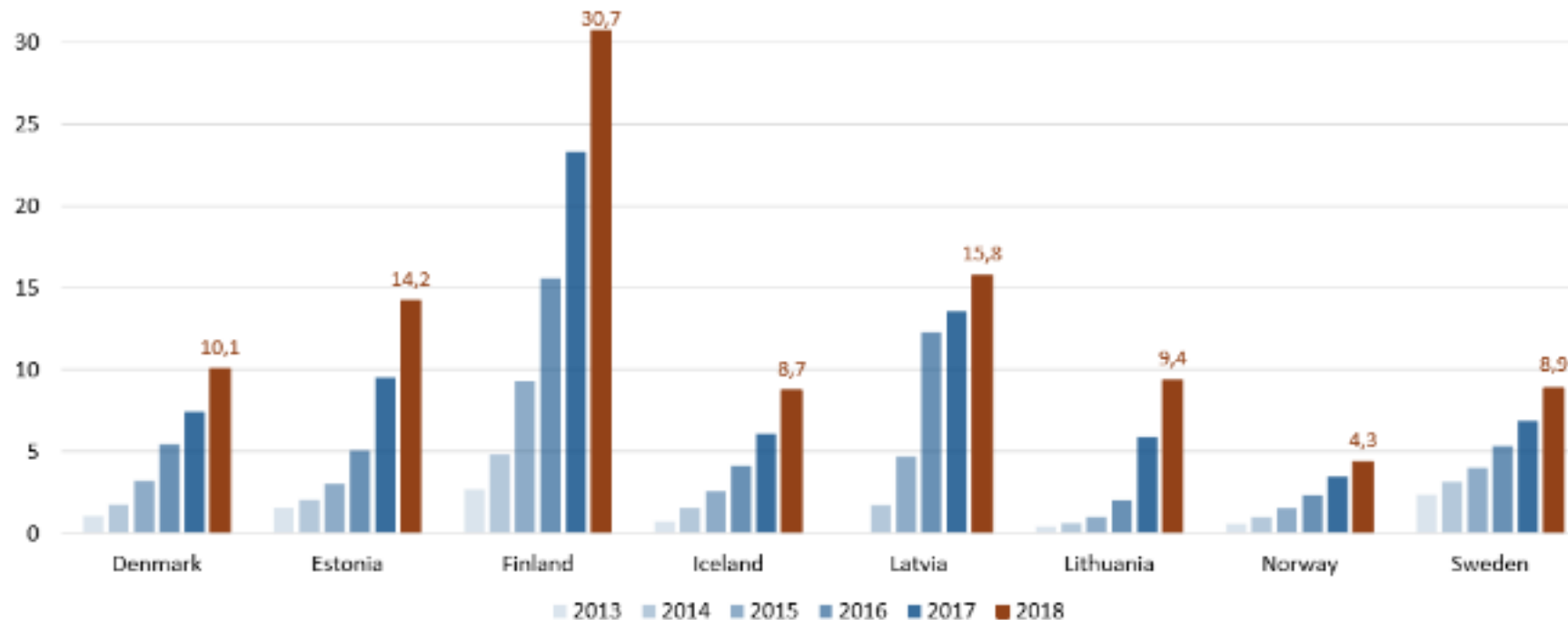
Cruise ship





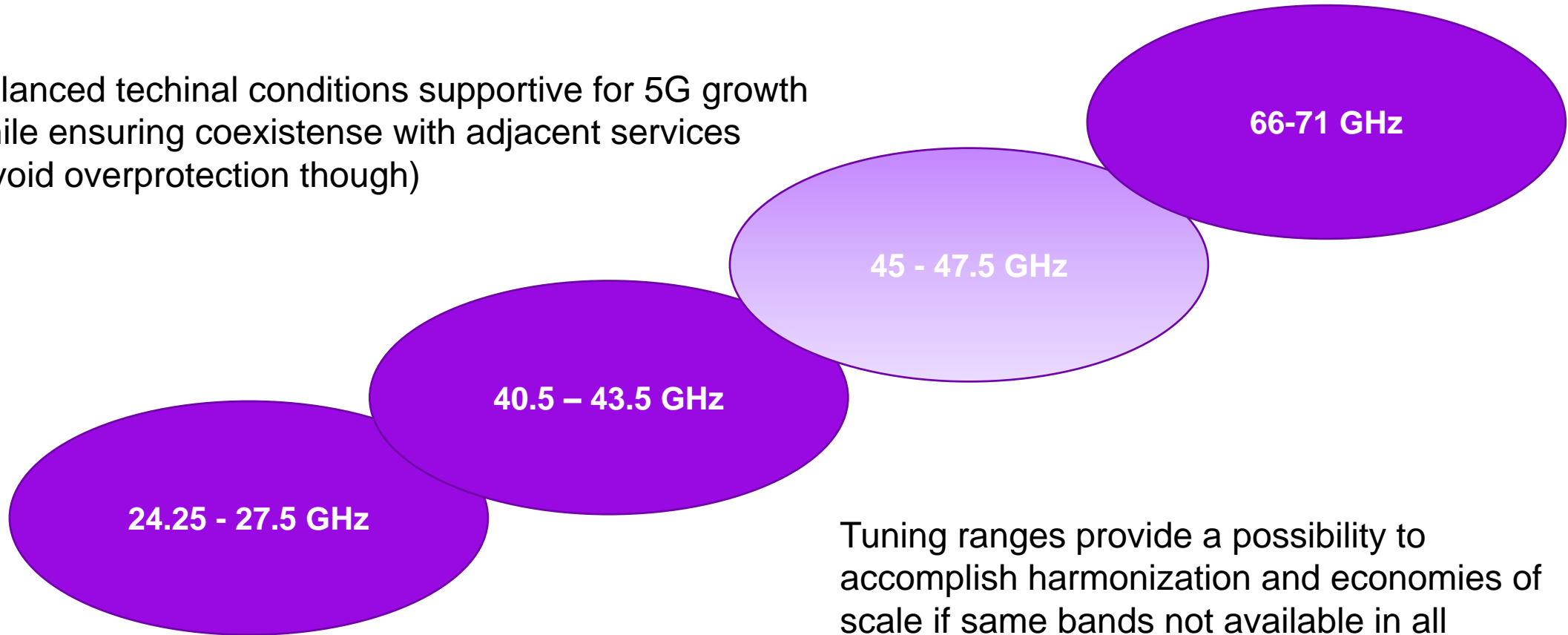
# DATA USAGE IN TELIA-COUNTRIES?

- Development of data transferred over mobile networks per capita in a month (Gbytes) in Nordic and Baltic countries in 2013-2018. - Up to 160% annual increase.
- 5G services expected to drive high demand, e.g.
  - HD video 90min/day => 84 GB monthly
  - VR/AR 10 min/day => 110 GB monthly
  - Very fast increase experienced already in Asian countries with early 5G-launch



# TELIA WISHLIST FOR WRC-19 MM-WAVES

Balanced technical conditions supportive for 5G growth while ensuring coexistence with adjacent services (avoid overprotection though)



Tuning ranges provide a possibility to accomplish harmonization and economies of scale if same bands not available in all regions

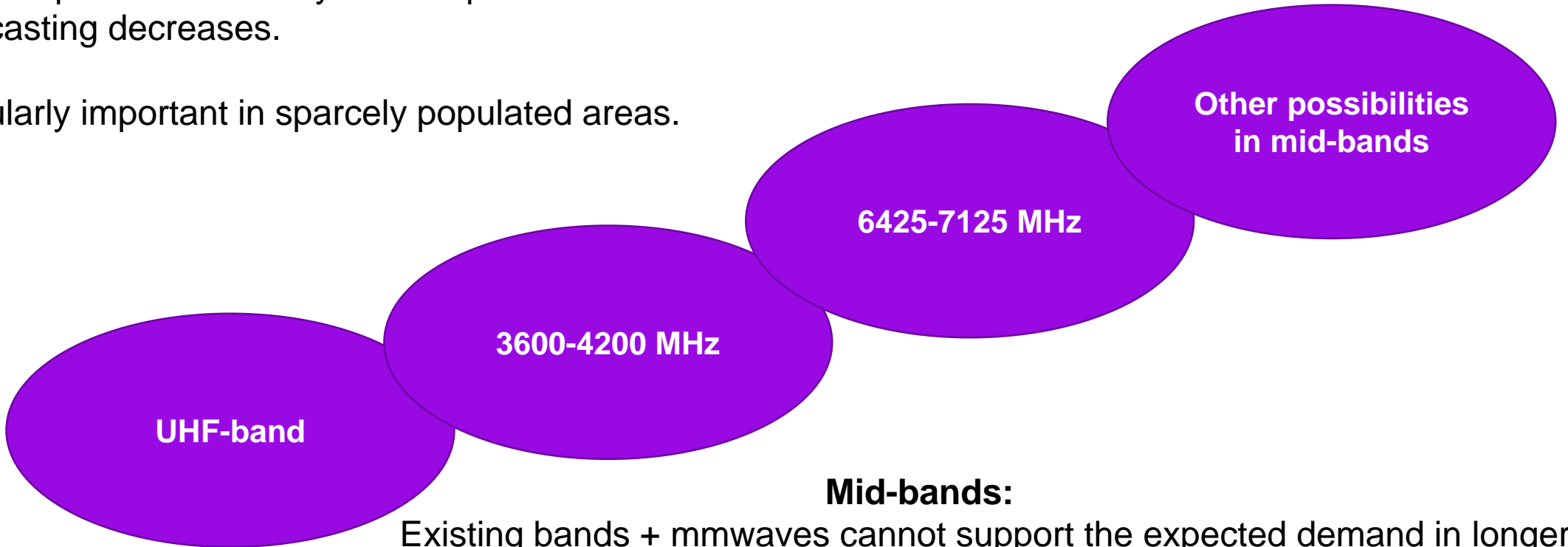


# TELIA WISHLIST FOR WRC-23 AGENDA

## UHF-band review:

Mobile data increase is driven by media consumption. Co-primary mobile allocation provides flexibility to use spectrum for mobile when use of terrestrial broadcasting decreases.

Particularly important in sparsely populated areas.



## Mid-bands:

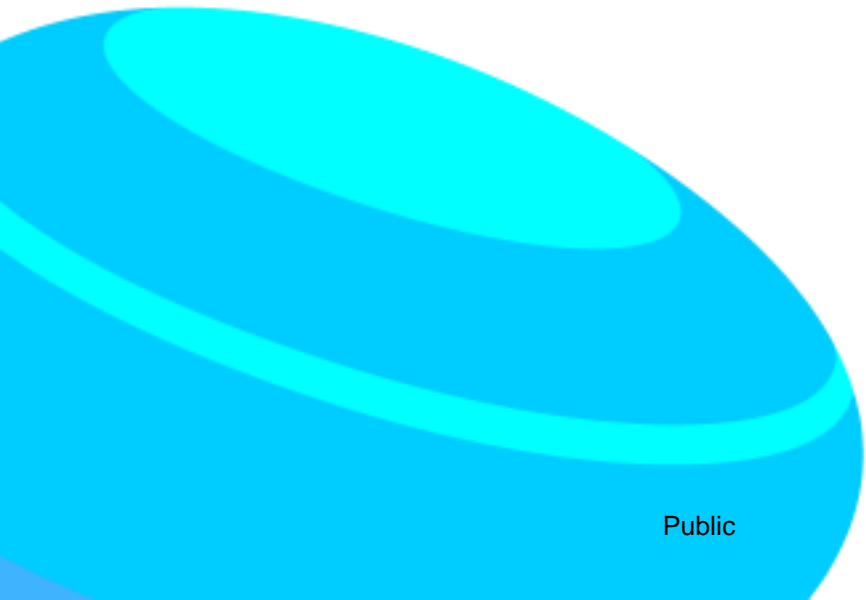
Existing bands + mmwaves cannot support the expected demand in longer term.

Spectrum enabling high capacity and sufficient propagation (incl. outdoor-indoor) is needed especially in urban and suburban areas in mid-long term.





# THANK YOU!



Public

