


# NR Narrowband Channel Bandwidth ( $<5\text{MHz}$ ) Railway Use Case

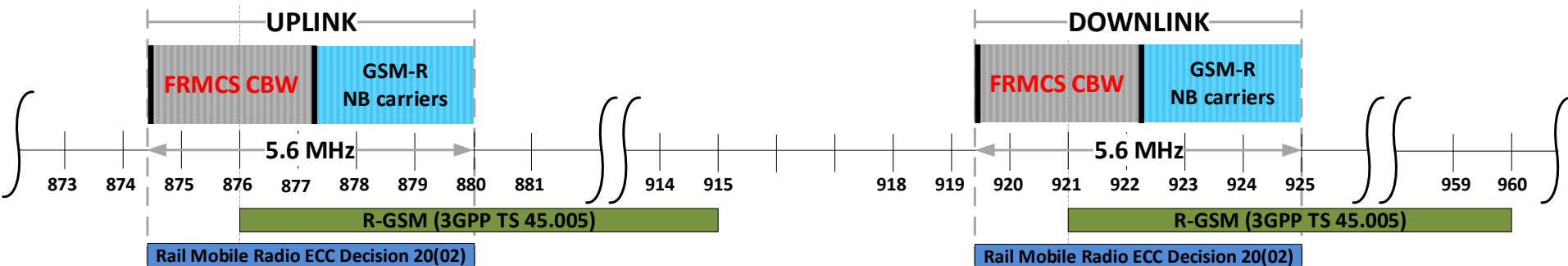



RAN Rel-18 WS



# Context

-  Limited spectrum in 900 MHz FDD and a need for lasting coexistence
  - Coexistence of GSM-R and FRMCS (5G NR) in an adjacent situation
  - CEPT-harmonized band of 2x 5.6 MHz (874.4-880/919.4-925 MHz);
  - FRMCS and GSM-R will co-exist for around 10 years starting from 2025;
  - The use of 1900 MHz is not necessarily planned by all European countries due to regulatory and economic constraints (i.e., theoretically doubles the number of sites required).



-  GSM-R is in operation & will remain operational alongside FRMCS
  - Railway's constraint imply to preserve at least 10-14 GSM-R carriers dependent on the traffic demands in specific railway environments.
  - Use case envisions co-location of GSM-R & FRMCS at similar power.

# Study Item Objectives

- 📶 To identify the range of channel bandwidths less than 5 MHz to meet regulatory spectrum block allocations (with limitation to FDD);
- 📶 Identify limitations to NR physical layer to support narrowband channel bandwidth (i.e., channel design synchronisation, train speed);



# Summary



- 📶 FRMCS deployments in Europe will start in 2025.
- 📶 The use of FRMCS, as opposed to the use of GSM-R, will increase significantly because it will also go hand in hand with the digitization and automation of rail traffic. The challenge is to coordinate the different roadmaps of the European countries in the rail eco system through technological adjustments (e.g., use of 5G NR).
- 📶 The provision of the CBW <5MHz is a global initiative together with partners like Anterix, Qualcomm and Nokia.
- 📶 Study proposal is an opportunity to design the 3GPP 5GS eco system for an even broader user community.



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