



Telecommunications
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TECH DEEP DIVE

TTDD 2026 CONFERENCE (9th EDITION)

**SHAPING NEXT DECADE OF TELECOMMUNICATIONS:
6G STANDARDS, SYSTEMS AND CROSS-SECTOR SYNERGIES**

 **Date:** 7-10 July 2026

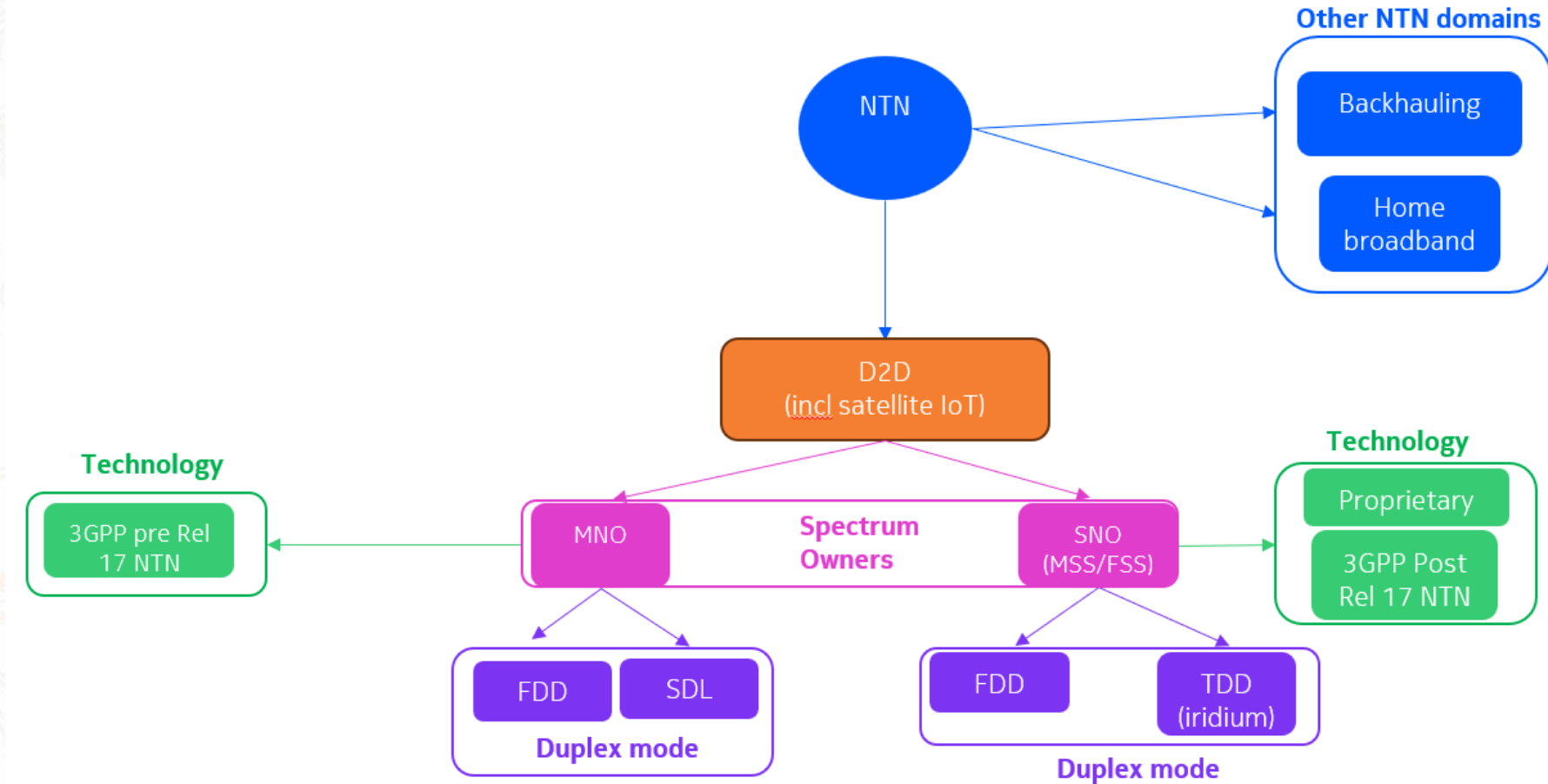
WRC-27 at Our Doorsteps: Perspectives on IMT Spectrum Priorities

Perspectives on the convergence between terrestrial and non-terrestrial networks in the evolution towards 6G

by

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Applications of Non-Terrestrial Networks



D2D based on TN 3GPP Pre Rel-17 standards, adopting satellite modifications (most of the current D2D implementations)



**3GPP
Rel-18/19/20
NTN standards**



6G

Benchmarking D2D capacity

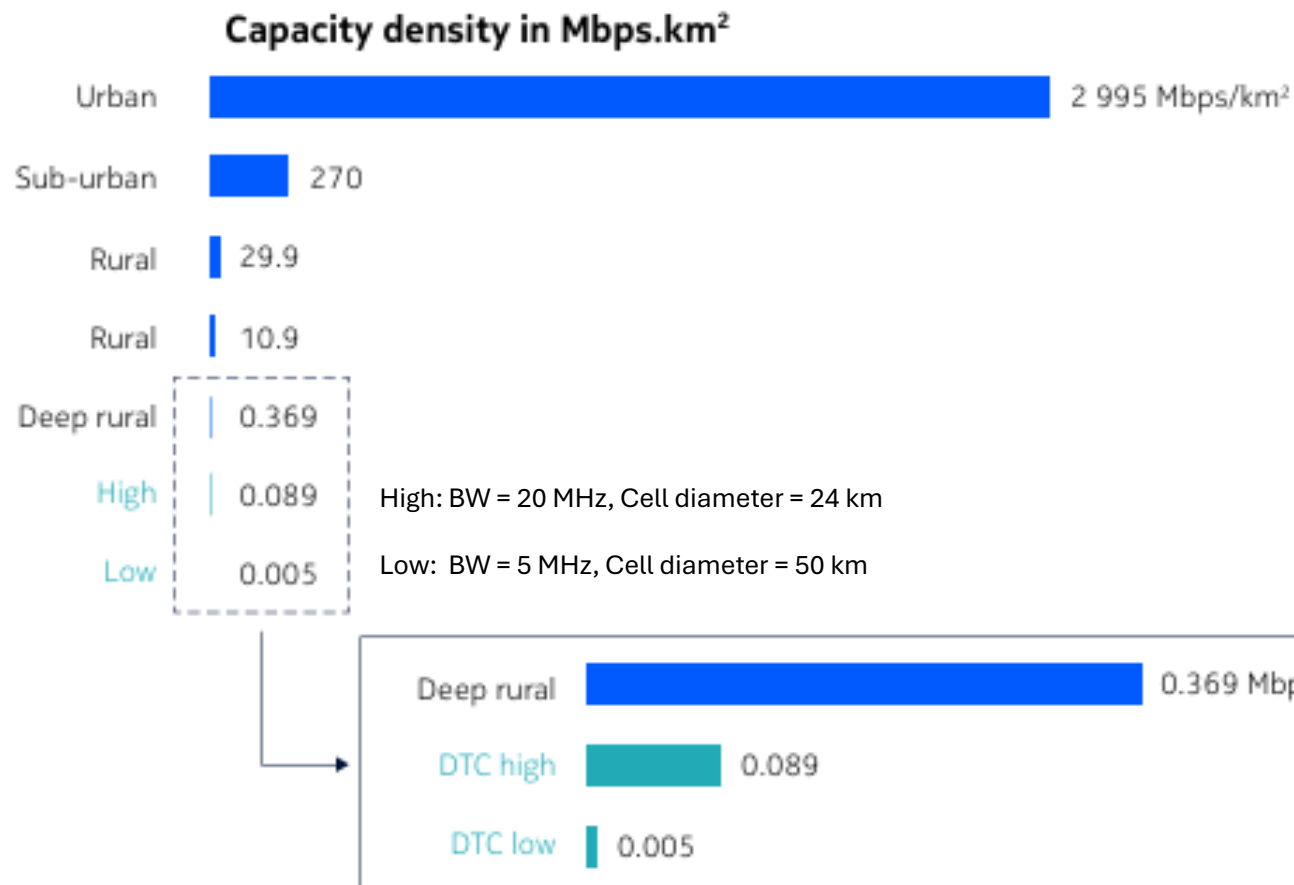
FWA: BW = 100 MHz

Terrestrial 5G
(100 MHz TDD)

BW = 80 MHz,
Rural : 3km inter-site
Deep rural: 10km inter-site

Terrestrial 5G
(80 MHz FDD)

Satellite DTC

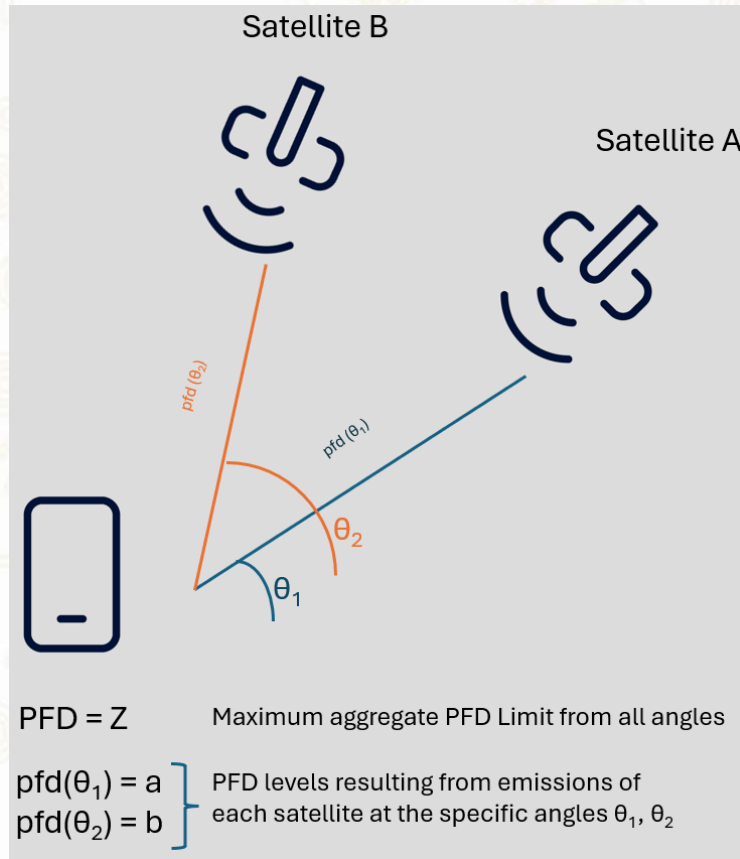


Source: [Satellite Communication Benchmarking with Terrestrial 5G Networks](#) (Nokia, 2025)

- D2D **VS** terrestrial 5G efficiency between 4 - 73 times **lower** (high to low scenario)²
- TN & NTN convergence to **complement** terrestrial network coverage, and close the 4% “coverage gap” ([GSMA, 2025](#))
- To act as an **additional layer of resilience** for improved disaster recovery in the case terrestrial networks are impacted e.g. due to natural disasters.

Regulatory priorities

WRC-27 Agenda Item 1.13 (D2D in mobile bands below 2.7 GHz)



Appropriate limits for the protection of IMT UEs (Agg. PFD) and IMT BSs (EPFD)



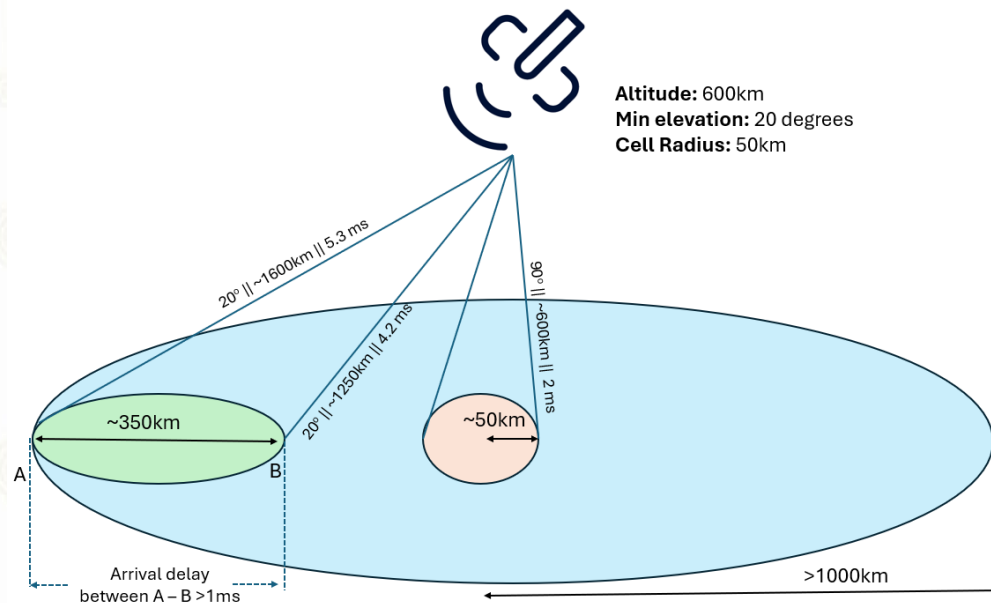
Tri-border co-frequency scenario
Multi-system aggregation up to 3dB

Other requirements

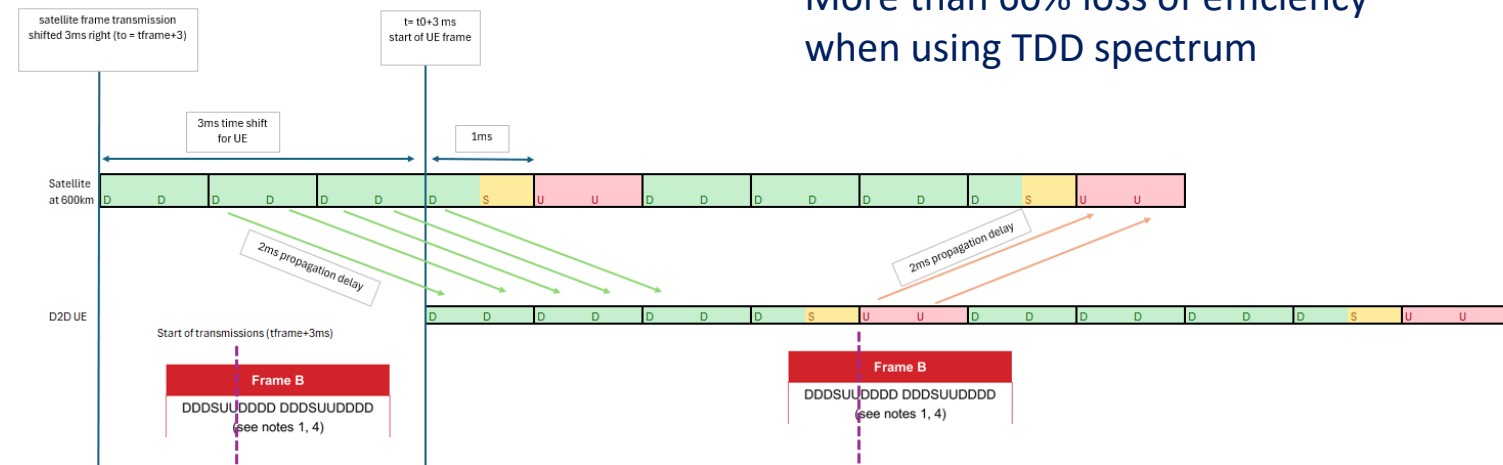
- D2D Authorisation under existing MNO licence (requiring SNO-MNO agreement)
- Compliance verification methodology
- Authorisation only of the frequency ranges that match the directionality of TN in that Region/Country

Frequency spectrum for D2D

- FDD bands provide the highest potential and flexibility for D2D as long as they align with the FDD directionality of terrestrial networks.
- TDD bands introduce significant challenges for D2D
 - Synchronisation with terrestrial networks
 - Serving multiple users within the satellite footprint (or within the satellite cell)
 - Reduced spectral efficiency
 - No existing or planned standardisation (e.g. in 3GPP)



More than 60% loss of efficiency when using TDD spectrum



Summary

D2D offers the potential to close the “coverage gap” (~4% of population) complementing the terrestrial network coverage. To achieve complementary use, the D2D authorisations should be tied to the existing MNO licences

Regulatory measures to protect terrestrial networks should be deterministic, well defined and provide confidence to mobile network operators that their networks will be protected

Not all frequency bands provide the same opportunities for an efficient D2D operation

- In some bands, the candidate D2D directionality may not align with the directionality by which the terrestrial mobile networks operate in some countries or regions.
- TDD bands for D2D provide significant challenges and lack operational spectral efficiency

Thank You

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