Cluster 1 and 3
Rural Spectrum Supply
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Agenda

- Rural Spectrum
- Types of spectrum
- Current use cases
- Summary

Rural Spectrum

Past

- Characteristic challenges
  - Distance
  - Terrain
  - Foliage
  - Weather (backhaul)
- Low mobility, speeds and density

Future

- High speed
- Clumps of density – eg villages plus corridors
- Fixed and mobile services, IoT

Types of Spectrum

- Lowband, <1GHz, in great demand, limited availability
- Midband, 1 <= 6GHz, previous little use, now in great demand, limited availability
- Highband – previously only for backhaul, now seen as viable for access (eg FWA)
- Rural offers chance of overlap, ie not contiguously used, can the N=x factor be increased or new models introduced for sharing

Current use cases

- Rural Mobility
  - Low or midband ideal, gives range and speed => 4G and 5G
- Rural Broadband - FWA
  - Midband, using mMIMO, >30 to 300Mbps fibre substitute
  - Highband, 26 or 28GHz using 5G FWA, eg US Cellular
    - Ericsson gNB, 7km and > 1Gbps
    - Nokia gNB, InSeego outdoor modem, >9km and ~ 1Gbps
- Radical shift in requirements
- Need to re-visit how rural spectrum is optimised to meet need

Summary

- Past – rural long distance, low speeds, islands
- Now – dense clusters and corridors, high speeds, fixed equivalent
- mMIMO and mmWave very applicable
- Spectrum sharing, dynamic allocation and high re-use needed to make more efficient use