

Regulator address - 5G status and roadmap

*5G Test Network Finland result
seminar*

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5G



Agenda

- ▶ Current and Future spectrum for mobile broadband in Finland
- ▶ Local 4G/5G networks in Finland
- ▶ WLAN in 5 GHz and 6 GHz band
- ▶ New Finnish regulation on critical parts of communications networks
- ▶ Traficom's actions towards 6G



“Make it available”

Spectrum for mobile broadband in Finland

- ▶ Three operators with nationwide coverage
 - ▶ > 99% of population with 2G, 3G & 4G
 - ▶ ~70% of households with 5G
 - ▶ New spectrum quickly into use without fiscal goals: cheaper to build, easier to plan, less congestion, more capacity
 - ▶ Unlimited data, inexpensive prices, developed networks, good coverage
- ▶ Dedicated spectrum for local networks
 - ▶ 2300 – 2320 MHz (20 MHz)
 - ▶ 24.25 – 25.1 GHz (850 MHz)

Current spectrum



Future spectrum



ITU-R: Technical and operational characteristics of land-mobile service applications in the frequency range 275-450 GHz

Local 4G/5G networks in Finland

- ▶ 2300-2320 MHz and 24.25-25.1 GHz are allocated for local 4G/5G networks.
 - ▶ Radio licenses are granted by Traficom.
- ▶ The local bands can be used for
 - ▶ local private use: factories, power plants, ports, industry and university campuses
 - ▶ small-scale public networks: shopping centres, sports arenas, passenger harbors, etc.
 - ▶ Previously all public mobile networks required a network license issued by the Government.
 - ▶ Fixed wireless access: Subscriptions can only be used in the pre-defined operating location, primarily using a fixed outdoor antenna installed in the building.



Regulatory information on local 4G/5G networks

- ▶ Main webpage:

<https://www.traficom.fi/en/communications/communications-networks/local-4g5g-networks>

- ▶ List of granted licenses and frequency reservations

<https://www.traficom.fi/en/communications/communications-networks/existing-radio-licenses-frequency-bands-2300-2320-mhz-and>

WLAN in 5 GHz and 6 GHz band

▶ 5 GHz band

- ▶ 5600-5650 MHz: use in UAV prohibited to protect weather radars. Implementation ongoing in Finland.
- ▶ Limitations for use in trains in parts of band proposed.
- ▶ Finland proposes national flexibility of implementation of limitations if small or no interference risk is seen.

▶ 6 GHz band

- ▶ 5945-6425 MHz (200 mW indoor, 25 mW outdoor) implementation ongoing in Finland based on EC decision.
 - ▶ Protection of radio links is a national concern that lies on spectrum supervision.
- ▶ Finland: Upper 6 GHz band should be investigated for IMT in WRC 2023.



Traficom regulation on critical parts of communications network – legal basis and context

- ▶ New Section 244a of the Act on Electronic Communications Services
 - ▶ Prohibits the use of a communications network device, in a critical part of the network, that could endanger national security and national defense
- ▶ Complements existing obligations, regulations and Traficom's powers on information security and resilience of communications networks
 - ▶ Already before the new provision, legislation in general provided a good basis for ensuring the security of 5G and earlier networks, through risk-based requirements
 - ▶ The principal aim of the new legislation is to take better into account the risks to national security and national defense

Traficom regulation on critical parts of a communications network - content

- ▶ Identification and documentation of the critical parts of a communications network (duties of the operator)
- ▶ Critical parts of a communications network (technology neutral)
- ▶ Critical parts of 4G- and 5G-networks, functions supporting services at the edge of the network and IP-based mobile telephone services

3 Identification and documentation of the critical parts of a communications network

A telecommunications operator and a dedicated network operator shall identify the critical parts of its communications network and the components of a communications network or service used therein. A telecommunications operator and a dedicated network operator shall draw up and maintain up-to-date documentation on the critical parts of its communications network it has identified, the components of a communications network or service used therein and the grounds for its assessment.

A telecommunications operator and a dedicated network operator shall document the grounds for its assessment if, on the basis of section 7, it considers that a 4G or 5G network function or measure referred to in Table 1 or 2 below is not a critical part of its communications network. The documentation of these parts of a communications network and the components of a communications network or service used therein shall also be subject to the provisions of subsection 1 above.

A dedicated network operator shall assess in particular whether a base station in its dedicated network is a critical part of the communications network, taking into account especially the geographical coverage area of the dedicated network, an individual base station's share of the network traffic and the functions and measures carried out by the base station in the dedicated network. The dedicated network operator shall draw up and maintain documentation on its assessment.

Actions by Traficom towards 6G

▶ Spectrum & regulation

- ▶ International activities on new spectrum and terms & conditions, licencing regimes and dynamic spectrum use
 - ▶ better support for **shared use** and **resilience to in-band and adjacent band radio interference** (read: better receivers)
- ▶ Assign spectrum for national and local use, support technology neutrality and reuse of current mobile bands
- ▶ **Grant radio licenses for trials and to dedicated spectrum for research, development and educational purposes**
- ▶ Enabling regulation for local networks, infrastructure sharing, spectrum sharing and leasing
- ▶ Support building of fibre and passive infrastructure
- ▶ Regulation on critical parts of communications networks (security and reliability), 5G cyber security regulations and reference architecture

▶ Cross-sectoral co-operation

- ▶ **Supporting and participating in RDI-projects related to wireless communication for verticals**
- ▶ Supporting development of transport automation and its digital infrastructure
- ▶ Climate and Environmental Strategy for the ICT Sector
- ▶ **5G webinars and newsletters by 5G Momentum**
- ▶ Participation in 6G program work of European Space Agency
- ▶ Arranging and supporting hackathons
 - ▶ 5g Cyber Security Hacks 2019 & 2021, Galileo Innovation Challenge 2019, Drone Tournament 2021
- ▶ **Active dialogue with companies, research organisations and the public sector**

*We all share the drive to
move and communicate.
Your connections are close
to our heart.*

TRAFICOM

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5G



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