

# Public consultation on the perspectives for the use of the 3800-4200 MHz radio frequency range - RTT Lithuania

Nokia response

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# Introduction

[Nokia](#) welcomes the opportunity to respond to the Communications Regulatory Authority of the Republic of Lithuania (RTT) public consultation on the perspectives of the use of the 3800-4200 MHz radio frequency range and provide our view on how the band can be used for mobile connectivity for enterprises and private networks, with a view that includes the broader context of the European discussions.

Nokia, being a B2B technology innovation leader in networking, we bring together the world's people, machines and devices to realize the potential of digital in every industry. Nokia has been involved in the technical and regulatory discussions for the 3.8-4.2 GHz band in the CEPT PT1 working group providing studies and insights to evaluate the potential of the band to be used for low and medium power 5G local deployments. The work that continues in the FM60 group, in which Nokia is also actively contributing, is aimed at providing the regulatory toolboxes that will offer guidance and flexibility at national level for administrations to develop frameworks for use of this band while adapting to the local market structure and demand.

From this perspective Nokia encourages RTT to allocate the entire 3.8-4.2 GHz band at national level for local area use for enterprises and private networks, with a flexible approach in the short and medium term. Consistent with the upcoming EC Decision for the band, we are of view that the assignment in this band should be done in a coordinated manner with the other Member States to avoid inefficiencies in licensing and allow for a potential reorganisation of the band as suggested by the Commission's draft version of the decision.

Below we provide our inputs to the relevant questions based on our experience as a network equipment provider in the 3.8-4.2 GHz band.

What would be the demand for the 3800-4200 MHz band for private low- and medium-power terrestrial networks in Lithuania and when this demand could arise?

1. What is the current demand for private networks?

**Nokia:** Nokia as network equipment vendor supports Industry 4.0 in planning and developing private networks and enterprise solutions but cannot forecast with certainty the actual market demand at national level.

2. How relevant is the use of the 3800-4200 MHz band for private networks deployment now and in the future?

**Nokia:** The 3.8-4.2 GHz band is significantly relevant for private network deployments as it lays within the wider 3GPP band n77 (3.3-4.2 GHz). The global 5G ecosystem support has grown significantly over the last years across band n77 and one of the reasons is the fact that it lays adjacent to the 5G public mobile band 3.4-3.8 GHz. Furthermore, the 400 MHz of spectrum available in this range, combined with the fact that in Lithuania there are no FSS earth stations and no fixed links in the band, increases further the attractiveness and the opportunities that the band can offer to deploy local networks to accommodate a variety of use cases.

3. In which area would there be such a need (e.g. cities, suburbs, factories, ports, etc.)? What should be the area of the site (e.g. in square kilometres)?

**Nokia:** From our global experience, networks using the 3.8-4.2 GHz band can be deployed in all types of environments from urban areas to ports and airports, to local communities, industrial zones and agriculture land areas, depending on the use case they expect to address. The footprint of the network depends on the type of use. While low power networks are generally more localized in terms of covered area, medium power networks can serve greater areas, including the provision of rural broadband through FWA. Therefore, the framework and the licence conditions for this band should provide flexibility and granularity, to avoid limiting networks to predetermined coverage areas and negatively impact the cost of the business case, and thus the attractiveness for the prospective licensees. The coverage area depends on the use case, the number of serving users, the environment where the network is deployed and thus additional limitations in coverage would further artificially decrease the flexibility of the business case.

4. How many such networks do you plan to deploy (including specific locations)? Would there be a need for roaming between networks?

**Nokia:** Nokia is a network equipment vendor supporting prospective licensees to plan, manage, deploy and maintain their private/enterprise networks offering solutions that can support their needs. From our experience in deploying private/enterprise networks in the 3.8-4.2 GHz band, we see the predominant use case being a localised network which does not require roaming. However, depending on the use case and the size of the planned deployment, the possibility of roaming among networks could be desired/requested by the user.

5. What would be the use (e.g. indoors and/or outdoors)?

**Nokia:** The regulatory framework covers both types of usage allowing for different and wider use cases to be implemented.

6. What services would you provide through such networks and what kind of activities would you carry out?

**Nokia:** Nokia has experience in deploying local networks in the 3.8-4.2 GHz band that address various use cases. Some of the enabled use cases include:

1. Industrial/Manufacturing automation: Robotics and machine control, predictive maintenance, digital twin applications in car manufacturing plants
2. Ports/Logistics: Remote crane operation, container handling, vehicle and asset tracking and monitoring in ports
3. Energy/Utilities: smart grid monitoring, automation, safety and video surveillance in the energy sector
4. Mining/Oil & gas: Heavy machinery remote operation and environmental monitoring in mining operations
5. Healthcare: secure operations, telemetry, real-time asset tracking in hospitals
6. Academia/Universities: 5G testbeds and campus applications for research

While these are some examples of how Nokia's networks have enabled use cases in various enterprise environments, the possibilities can be further leveraged and be tailored to address the needs of enterprises in various sectors.

7. What type of network architecture would you use (e.g. interconnected with public mobile radio networks, independent)?

**Nokia:** The type of network architecture depends on the use case. While we are aware of network deployments in the 3.8-4.2 GHz band which are interconnected to the public networks, Nokia's private/enterprise networks in the 3.8-4.2 GHz band have been predominantly deployed to address "independent" and localised use cases.

8. What are the specific requirements for private network radio communications?

**Nokia:** Our experience in deploying private networks in this band shows that the principal requirements include relative bandwidth availability of e.g. at least 40/50 MHz for sufficient QoS and QoE (however this of course depends on each use case requirements) and flexibility in deploying different UL/DL ratios to address more UL hungry use cases. In addition, while we understand that the purpose of the EIRP and antenna height limitations are to enable better coexistence with other private networks, we have identified the need for licence frameworks to enable the possibility of exceptions from those EIRP limitations in justified circumstances. For example, deploying private networks with higher powers and higher antenna heights in environments where coexistence is not an issue (e.g. large land areas with no neighbouring incumbents) can reduce the cost of the overall deployment cost, which can be a decisive factor for the viability of the business case.

#### 9. What is the width of the strip?

**Nokia:** Nokia utilises 3GPP technology in the private/enterprise network solutions. As such, all the bandwidth options offered by 3GPP (e.g. from 10 MHz up to 100 MHz) which are also included in the ECC Decision (24)01, are necessary to ensure both ecosystem availability as well as the support of the different use cases.

#### 10. Would you choose synchronisation with public mobile radio (5G) networks?

**Nokia:** The choice of frame structure depends on the use case that needs to be addressed. Nokia provides equipment based on the 3GPP technology in the 3.8-4.2 GHz band, including those for private/enterprise solutions.

Our expertise shows that the local networks in this band are predominantly synchronised or semi-synchronised with the public ones. The semi-synchronised operation, with its specific case of converting only DL frames to UL frames, offers the unique benefit of enabling flexibility in the UL/DL ratio, while maintaining a minimal risk of potential interference to public networks. However, in certain scenarios and for a limited number of specific use cases, the unsynchronised operation may better respond to the needs of the access seeker.

Additionally, considering the draft EC Decision on the 3.8-4.2 GHz band, we note the interest of the Commission to further evaluate the use of the band in the medium-term<sup>1</sup>. With that in mind, and to further smoothen the allocation of licences in the 3.8-4.2 GHz band from an administration perspective, we recommend starting authorising private/enterprise licences in a top-down approach, starting from 4.2 GHz downwards, e.g., within the 4.1-4.2 GHz portion of the band.

#### 11. Would you seek synchronisation with adjacent private networks?

**Nokia:** The potential synchronisation of adjacent private/local networks depends on the use cases addressed by the respective networks and the chosen UL/DL frame structure that better serve each use case. In principle, coexistence with adjacent 3GPP low/medium power networks in a semi-synchronised operation is not considered problematic, especially in the case when only the DL frames are used for UL. From a high-level perspective, under 3GPP technology, the synchronisation between neighbouring private networks (with different UL/DL ratios) would be necessary in the case of interference being caused and not necessarily by default, and in advance of deploying the network. Licencing frameworks that offer the freedom for communication and coordination among neighbouring networks to resolve any potential issues that might occur is welcomed. By doing so, they enable flexibility in the network deployment and in the cases of interference when direct coordination cannot reach, the regulator should, through enforcement action, to solve contentious situations.

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<sup>1</sup> <https://circabc.europa.eu/ui/group/af096568-9b95-4bb2-84db-45b307b06a22/library/796922b7-2a2e-4d3e-a47e-47899923bdd7/details>

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