Public consultation on the assignment of radio frequencies in the 3800-4200 MHz radio spectrum band for local area networks of low and medium power operations – AKOS Slovenia

Nokia response

29 August 2025

1. Do you agree that according to Article 47 of the ZEK-2 we take as a criterion: frequencies from 3800 – 4110 MHz are assigned per application, while there will be a public tender for the last 90 MHz, i.e. 4110 to 4200 MHz?

Nokia: Nokia would like to highlight that the EC Decision as validated by RSCOM, in its recital 20, states that:

> *"Without prejudice to the right of Member States to authorise the use of spectrum in their territory,* ***future review of the spectrum use under this Decision would be facilitated through convergent use of consistent portions of spectrum across the EU, such as starting from the upper part of the band.****"*

The above paragraph of the EC Decision suggests that Member States should start authorising portions of the 3.8-4.2 GHz band to licensees adopting a top-to-bottom approach, starting from 4.2 GHz downwards.

The proposed authorisation approach by AKOS i.e. that *"the Agency will start allocating frequencies in the lower part of the frequency band, from 3800 to 4110 MHz"* is, therefore, in contradiction with the recommendation of the Recital 20 of the EC Decision. Such an approach in Slovenia could introduce additional challenges in the medium-long term, when the future revision of the band across the EU will occur, potentially leading to associated costs to relocate the users of the band. Equally, a misalignment with the European recommendations may increase uncertainty when applying for licences.

Regarding the reservation of 90 MHz for a potential future auction – if demand is exceeded in certain geographies – we would like to highlight some observations from the UK Shared Access Licencing framework, which has been established for about 5 years already. The UK – that is ~12 times larger than Slovenia in terms of geographical landmass and ~32 times larger in terms of population – is having a total of 563 (either low or medium power) licences actively deployed across the whole country covering the local needs of connectivity, with 70% of those concentrated within 200MHz of the 3800-4200 MHz band.

The following figures detail the current situation in the UK:

- Overall, the UK counts for 563 active licences (either low or medium power) across the country. The spread of geographic locations of those licences can be seen in Figure 1 below.

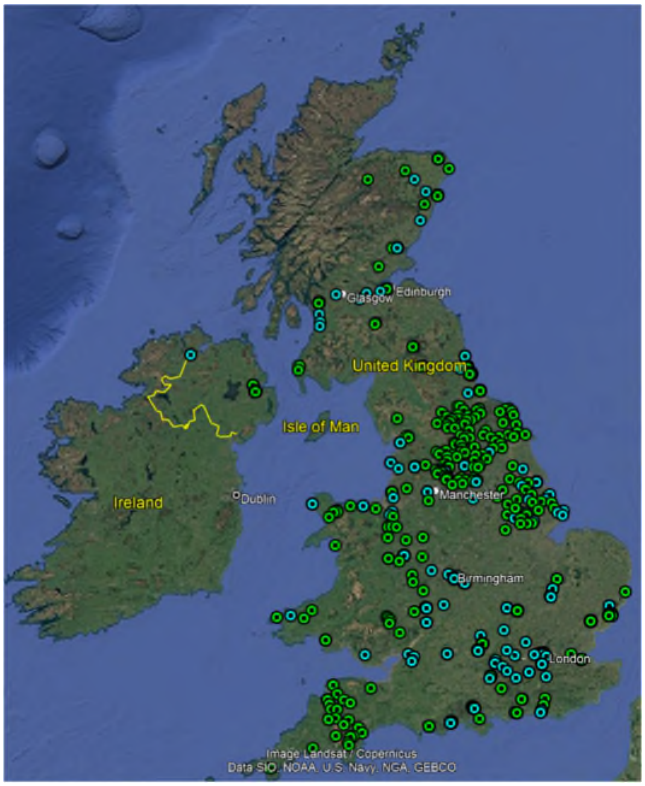

Figure 1: Low and medium power licences in UK (Low – blue, medium – green)

- The medium power licences seem to be concentrated in the North-East of the UK and the typical separation distance between them is approximately 8 km, as shown in the Figure 2.

Figure 2: Typical separation distances of medium power licences

- An additional statistic indicates that are currently approximately 219 medium power licences of 100 MHz bandwidth across the whole country.

- Regarding the low power licences, as shown in Figure 3, London – that has a weekday daytime population of 9-10 million people – has only a few low power licences that coexist in the 3.8-4.2 GHz band.

Figure 3: Low Power BS in London

- The Figure 4 below indicates that approximately 70% of all the current UK low and medium power licences are concentrated within almost 200 MHz in the 3.8-4.2 GHz band.

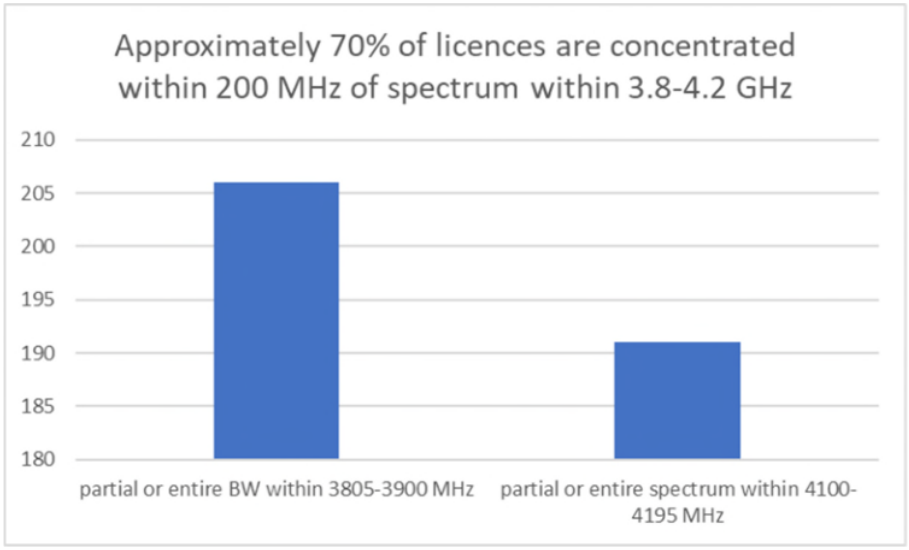

Figure 4: Frequency spectrum in the UK where 70% of licences are deployed

Considering the above, we are of view that in the case of Slovenia, reservation of 90 MHz of spectrum as back-up in case local demand exceeds availability seems unnecessary and may lead to inefficient management of the spectrum resource. Moreover, reserving the upper 90 MHz of spectrum for potential second stage of licensing is in contradiction with the recommendation in the Recital 20 of the EC Decision for the band.

2. If you answered NO to the first question, please state the reason and suggest a frequency limit between the award of the application and the call for tenders.

Nokia: The analysis above sourcing insights and comparisons of the UK's SAL framework and the fact that Slovenia already made available other frequency bands for local networks, suggest that 200 MHz of spectrum in the 3.8-4.2 GHz band would likely be sufficient to address the requirements of low/medium power local connectivity. Following a top-to-bottom authorisation approach as suggested in EC Decision, the 4.0-4.2 GHz could be used for low/medium local area licences. The lower 3.8-4.0 GHz portion of the band could be reserved and upon the future revision of the band in the EU, potentially open either for expanding the mobile public networks, or a mixed use between mobile public networks and local low/medium power networks in the event that the initial 200 MHz reserved for this scope are extensively used and demand exceed the existing offer.

3. Do you think it is necessary to reserve the 3800-3860 MHz frequency sub-band with synchronized mode for municipalities until 31.12.2027?

Nokia: In addition, our recommendation to follow the provisions in the EC Decision, we would highlight that the ECC Report 358 has shown that some frequency separation could be possibly required to ensure that unsynchronised WBB LMP networks do not interfere with public mobile networks below 3.8 GHz.

A top-to-bottom authorisation approach could avoid the potential risk of unsynchronised WBB LMP networks interfering with public mobile networks. It is worth highlighting however, that the semi-synchronised approach (with DL to UL modifications) has not proven to be problematic in its coexistence with mobile networks.

However, it remains unclear what role municipalities have in local area networks. If, reserving spectrum for municipalities implies that those entities would replace the coverage of mobile operators' high power networks with local low/medium power networks, then in our view this does not have any meaningful or justified purpose. Finally, we could not find in AKOS's consultation any relevance or justification why the end of 2027 has been chosen as a deadline for such approach.

4. If you answered YES to the third question and you are a municipality and you are planning to build a local network, when do you plan to start using reserved spectrum?

Nokia: N/A

5. Should the municipal agency reserve 200 MHz in the 28.0-28.4 GHz/29.0-29.4 GHz band instead of the 3800-3860 MHz frequency sub-band?

Nokia: Our understanding is that the discussions at CEPT and in AKOS's consultation regarding the 60 MHz above 3.8 GHz, aims to indicate a frequency separation that provides sufficient margin for unsynchronised WBB LMP networks to coexist with MFCN below 3.8 GHz. This question, as we understand it, implies that 60 MHz would be reserved for municipalities, for which a comparison between a bandwidth of 60 MHz in 3.8-3.86 GHz or 200 MHz in mmWave bands is questioned. If our understanding is correct, we

believe that there should be no spectrum reservation for such use case. Mobile broadband in the geographical areas of municipalities should be achieved through the coverage of the networks of mobile operators, rather than reserving spectrum and setting the expectation for municipalities to provide mobile broadband coverage. The low/medium power local area licencing framework intended for this band is to support the needs for enterprises and vertical industries, or the connectivity needs for certain remote and rural areas for which medium power licences can deploy FWA applications to provide coverage. As such, in our view, reserving spectrum for providing mobile coverage in municipalities, does not demonstrate an efficient spectrum management approach. Instead, spectrum in the lower part of the band could be preserved for enhancing the mobile broadband capacity of the public mobile networks in locations where additional capacity is needed. Reserving the lower part of the 3.8-4.2 GHz band for future use by mobile operators who have the expertise and the existing network infrastructure for addressing the growing 5G data needs in the coming years appears to be a more efficient use of this valuable spectrum leading to increased mobile capacity at a lower cost per bit.

6. Please provide any other suggestions for improvement.

Nokia: A final point we would like to highlight regards AKOS's proposal for the duration of those licences ranging from one month to 20 years.

In our view, 20 years licenses are suitable for public mobile networks, contrary to enterprises whose requirements could be more dynamic and flexible. While longer licence duration provides guarantees for investments in national networks, they can constrain enterprises with localised needs for which such long-term engagements can be excessive. Licenses of one month duration, while likely suitable for specific short-term use cases, stay also as of an exception rather than regular. We note that various licensing schemes are considered/adopted in different countries across Europe to strike a reasonable balance between the license conditions including duration and price in order to encourage enterprises to adopt mobile solutions. As such, flexibility is expected, with typical initial licensing duration of a shorter length - few years (e.g. two or three), and the possibility for renewal. However, licensing conditions should include some minimal obligations for deployment to avoid spectrum hoarding and ensure that the spectrum is used. Shorter license durations would allow enterprises to flexibly plan their networks in line with their development plans, while also enabling higher efficiency in a potential future revision of the band in the EU.

Additionally, noting the methodology described in the consultation document to determine pricing of spectrum in this band, the timelines and the associated coverage obligation for those licences, we see some misalignment of the expected "short-term" purpose of use of the 3.8-4.2 GHz band. The licence obligations refer to timelines associated with certain percentages of geographical coverage within the licence area. Enterprise networks e.g. using low power licences may not necessarily need to cover the entire area of their licence. Factories may require providing coverage only in certain areas within their wider campus for specific applications such as machinery and process

automation. Obligations to cover the entire area of operation under “use it or lose it” will impose significant and unnecessary burden for the licensees. Equally, medium power licences used for example for Fixed Wireless Access (P-P); even if the licensees are municipalities, the concept of coverage or population may not be very relevant. Such coverage obligations may disadvantage and discourage applications, as the nature of the low/medium power operation of this band is local, rather than universal.

Consequently, we would like to urge AKOS to review the proposed framework for low/medium power operations in the 3.8-4.2 GHz band, enabling adequate licences duration for the scope of the band licences with shorter duration and an option of renewal rather than tying enterprises in long inflexible spectrum licences. Such approach would help AKOS and reduce challenges in the event of a future revision of the band.

Lastly, we would like to recommend that an alternative “use it or lose it” requirement and pricing methodology should be developed by AKOS that review down the coverage obligations which most of the times may not serve the enterprise purpose for local licences.

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