# Ericsson's Responses to OFCA's consultation on Proposed Change in the Allocation of the 3.4 – 3.7 GHz Band from Fixed Satellite Service to Mobile Service

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# 1 Distribution and contact details

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# 2 About Ericsson

Over the past 140 years, Ericsson has been at the forefront of communications technology. Today, we are committed to maximizing customer value by continuously evolving our business portfolio and leading the ICT industry.

We are a global leader in delivering ICT solutions. In fact, 40% of the world's mobile traffic is carried over Ericsson networks. We have customers in over 180 countries and comprehensive industry solutions ranging from Cloud services and Mobile Broadband to Network Design and Optimization.

Our services, software and infrastructure - especially in mobility, broadband and the cloud - are enabling the communications industry and other sectors to do better business, increase efficiency, improve user experience and capture new opportunities.

Ericsson has one of the industry's strongest patent portfolios with a total count of over 42,000 granted patents. R&D is at the heart of our business and approximately 23,700 employees are dedicated to our R&D activities. This commitment to R&D allows us to drive forward our vision for a Networked Society - one where everyone and everything is connected in real time - enabling new ways to collaborate, share and get informed.

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# 3 Ericsson favours efficient use of spectrum

Ericsson favours an efficient use of spectrum. This means licensed and unlicensed as well as multimedia distribution spectrum. Ericsson wants to see enough spectrum secured to meet the consumer driven growth of mobile broadband usage for 4G and for next generation 5G networks, alongside the needs of other spectrum users like the broadcast industry.

All radio-based services are indeed important. However, society is continuously changing, and the success of mobile broadband has proven to be unmatched in terms of consumer demand and penetration. The terrestrial cellular services are also clearly empowering people and enriching their lives, stimulating progress for citizens in all countries of the world.

Ericsson believes this is about satisfying the coverage needs in both under-served and metropolitan areas, as well as bridging the digital divides between regions and people. There are many benefits to be gained from finding solutions to the issues faced regarding radio spectrum – for both individuals and society at large.

Access to sufficient spectrum is of paramount importance in terms of providing affordable mobile broadband and meeting the tremendous growth in mobile data traffic. Ericsson feel confident in our journey towards 5G and with right allocated efficient spectrum usage we will soon experience a fully developed Networked Society.

The C-band, i.e. 3300-4200 MHz and 4400-4990 MHz, offers the unique opportunity for largest amount of spectrum below 6 GHz. The amount of contiguous spectrum in this band offers tremendous opportunity for the exploitation of the latest IMT technologies, particularly regarding to the 5G New Radio air interface which will deliver increased capacity and connectivity.

Ericsson welcomes the opportunity to provide response to OFCA's consultation on Proposed Change in the Allocation of the 3.4 – 3.7 GHz Band from Fixed Satellite Service to Mobile Service. We appreciate the effort of OFCA to enable a timely deployment of 5G in Hong Kong by ensuring availability of the proposed spectrum.

Ericsson would like to provide the following views on the Questions 1) to 6).


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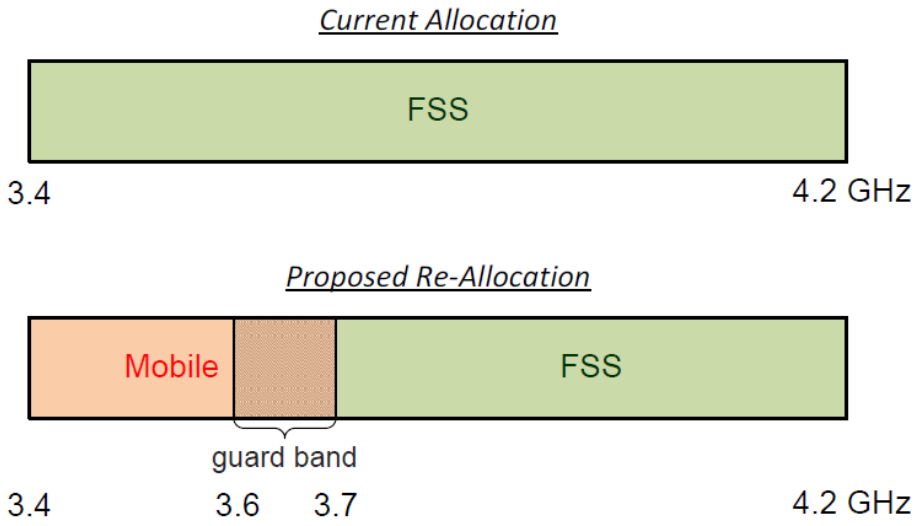
# 4 Ericsson's Responses

## 4.1 Question 1




*What are your views on the above Proposed Re-Allocation?*

***Ericsson's Response:***

The 3300-4200 MHz range offers an optimal balance between coverage and capacity, which will support a broad range of 5G applications. Applications such as augmented and virtual reality, the Internet of Things (IoT), connected transport and smart cities will increase the spectrum need in our industry and the 3300-4200 MHz spectrum range will be important to deliver the feature rich services that are being demanded by the citizen in Hong Kong.

Ericsson supports the availability of the largest possible contiguous frequency range for IMT within the 3300-4200 MHz range. The CA proposed allocation of 3400-3600 MHz to IMT serves as an important first step towards the wanted position of designing spectrum auctions to allow each mobile operator access to contiguous unpaired spectrum assignment in the order of 100 MHz.

The available lower frequencies (e.g. 2100, 1800, 900, 850 MHz) may be used in combination with 3300-4200 MHz 5G-NR connectivity to provide additional coverage improvement, facilitating the reuse of existing sites.

Ericsson suggest FSS to migrate to higher frequencies. The full band 3300-4200 MHz will be used in different parts of the world for 5G and doing a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migration in Hong Kong to the upper part of the C-band may lead in future to a second migration step to yet higher frequencies. The band 3400-3800 MHz will be "pioneer band" for 5G in EU. The band 3600-4200 MHz is of interest for 5G in Japan and 3800-4200 MHz under discussion for Europe while 3700-4200 MHz in USA. This band will also be of interest for those countries that have satellite only in the lower part, i.e. 3400-3700 MHz. Therefore, it should be avoided to use the range 3300-4200 MHz for new satellite implementations but rather consider how to migrate current satellite users to higher frequencies to allow for mobile use in a long-term plan.

Regarding to CA proposed guard band of 100 MHz, Ericsson is in view of that choosing realistic assumptions on parameters and modelling of either system including selection of protection criteria are essential input for the recommendation of a suitable guard between IMT and FSS or IMT spectrum emission mask. There are detailed international studies on the coexistence of IMT and FSS which are useful to support further investigation by CA in Hong Kong. References include:

- Report ITU-R M.2368
- GSMA paper, "Considerations for the 3.5 GHz IMT range: getting ready for use"
- GSMA paper, "Fair FSS Sharing - Safeguarding mobile growth"
- CEPT ECC report, "Operational guidelines for spectrum sharing to support the implementation of the current ECC framework in the 3600-3800 MHz range"

Ericsson encourages CA to conduct further technical studies in order to minimize the guard band allocation below 100 MHz, based on realistic assumptions on system parameters and protection criteria.

## 4.2 Question 2

*Do you agree with the principle of protecting existing SMATV/EFTNS/SPETS systems operating in the adjacent band of 3.7 – 4.2 GHz with the implementation of the mitigating measures?*

***Ericsson's Response:***

Ericsson agrees with the principle of protecting existing SMATV/EFTNS/SPETS systems operating in the adjacent band of 3.7 – 4.2 GHz. However, the required mitigating measures and estimation of implied implementation works should be made known to mobile operators by CA prior to the spectrum auction stage.


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## 4.3 Question 3

*For implementation of the Proposed Re-Allocation, please suggest or give your views about any mitigating measures to be implemented for the existing systems and services as well as any precautions to be taken for the operation of the new mobile base stations to be operating in the 3.4 – 3.6 GHz band.*

***Ericsson's Response:***

Ericsson recommends an alignment between satellite and mobile network operators in Hong Kong to agree on protection criteria and field test cases to ascertain EMC between FSS and mobile services, as to verify the effectiveness of mitigating measures to be implemented.

## 4.4 Question 4

*What are your views on effecting the Proposed Re-Allocation in the early 2020, giving an advance notice period of two years if the relevant decision of the CA is made in early 2018?*

***Ericsson's Response:***

Ericsson agrees to the proposed re-allocation of 3400 – 3600 MHz no later than early 2020, giving an advance notice period of two years.

## 4.5 Question 5

*What are your views on the need to protect the TT&C channels of the licensed satellite networks at their specific locations from any harmful interference to be caused by public mobile services?*

***Ericsson's Response:***

Apart from restriction zones, shielding and antenna discrimination (smart antenna) mitigation techniques should be studied to enhance the co-existence between mobile and FSS services by reducing the separation distance.


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## 4.6 Question 6

*Do you have any views on other aspects of or issues relevant to this consultation?*

***Ericsson's Response:***

The band 3300 - 3400 MHz has an IMT identification in 45 countries from WRC-15 in the Radio Regulations from all three ITU Regions and will be part of an early band for 5G in markets like India and China. Ericsson recommends CA to re-consider inclusion of 3300 – 3400 MHz band range as well as the 3700 – 4200 MHz in the future plan of spectrum allocation for mobile services.

In addition, Ericsson encourages CA to also consider a 5G spectrum release plan above 20 GHz, i.e. the mmWave bands, which would bring Hong Kong to the frontline of mobile services innovation and will enhance its leadership position in defining the direction of 5G development.


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