
Hutchison Telephone Company Limited

**Response to the Consultation Paper dated 27 July 2017 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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Executive Summary

Proposed change in the Allocation of the 3.4 - 3.7 GHz Band from Fixed Satellite Service to Mobile Service

1. Hutchison makes this submission in response to the Consultation Paper issued by the CA. In this Consultation Paper, the CA proposed the vacation of the 3.4 – 3.7 GHz band (currently assigned for fixed satellite service (space-to-Earth)) with a view to re-allocating it for the provision of public mobile service in 2020.
2. Hutchison welcomes the CA’s proposal to re-allocate the 3.4 – 3.7 GHz band from fixed satellite service to mobile service in view of the industry demand for making available more spectrum for the provision of 5G services.
3. In addition, Hutchison urges the CA to release a long-term spectrum supply plan and provide the industry with a spectrum roadmap for 5G, which are urgently needed for telecommunications development in Hong Kong.

Mitigating Measures

4. On the implementation of the mitigating measures, we generally agree with the principle of protecting the non cable-based EFTNS and SPETS operating in the adjacent band of 3.7 – 4.2 GHz, but not the SMATV, mainly because the SMATV owners are not licensees under the TO. Hence, MNOs should not be held accountable for the rectification work to accommodate these unlicensed operators.

TT&C Station in Tai Po Industrial Estate

5. Due to technical and practicality reasons, Hutchison recommends that the current TT&C Station in Tai Po Industrial Estate shall be relocated to some other remote area in Hong Kong, whereas the one in Stanley may remain unchanged.

Use of 3.3 GHz Band for 5G Services

6. Considering that the Mainland China has conducted technical trials since 2016 for the use of frequency spectrum in the 3.3 – 3.6 GHz band for 5G services, we urge the CA to review the utilization of 3.3 GHz and study the feasibility of using the said frequency band for 5G services in Hong Kong.

I. Introduction

1. Hutchison Telephone Company Limited (“**Hutchison**”) makes this submission in response to the consultation paper on “Proposed Change in the Allocation of the 3.4 – 3.7 GHz Band from Fixed Satellite Service to Mobile Service” (“**Consultation Paper**”) issued by the Communications Authority (“**CA**”) on 27 July 2017.
2. In the Consultation Paper, the CA proposes to re-allocate 3.4 – 3.7 GHz band from fixed satellite service (space-to-Earth) to public mobile service in view of the industry demand for making available more spectrum for the provision of 5G services.
3. In Part II of this submission, we highlight and explain our views on the main issues in the Consultation Paper. Part III contains our answers to the specific questions raised in the Consultation Paper. Reference can be made to Part II of the submission for further explanations of these answers.

II. Response to Main Issues

1. Hutchison welcomes the CA’s proposal to re-allocate the 3.4 – 3.7 GHz band from fixed satellite service to mobile service in view of the industry demand for the provision of 5G services. However, we urge the CA to take a holistic approach to freeing up more frequency bands such as 700 MHz band and identifying other available bands, so as to provide the industry with a spectrum roadmap for 5G networks. To maintain Hong Kong as a commercial and communication hub, a long-term spectrum release plan is sorely needed.

Mitigating Measures

2. On the implementation of the mitigating measures, we generally agree with the principle of protecting the non cable-based external fixed telecommunications network services (“**EFTNS**”) / self-protected external telecommunications systems (“**SPETS**”) operating in the adjacent band of 3.7 – 4.2 GHz, but not the Satellite Master Antenna Television (“**SMATV**”). The owners and users of SMATV system, like television receive-only (“**TVRO**”) system, are not licensees under the Telecommunications Ordinance, Cap. 106 (the “**TO**”). Hence, SMATV should receive the same treatment as TVRO. By virtue of the foregoing, mobile network operators (“**MNOs**”) should not be held accountable for rectification work to accommodate these unlicensed operators.

TT&C Station in Tai Po Industrial Estate

3. We note that the satellite operators set up earth stations for telemetry, tracking and control (“**TT&C**”) of their satellite in orbit (“**TT&C Station**”) in Tai Po Industrial

Estate and Stanley. We share the view that the TT&C channels are pre-configured on board the satellites and hence it is not feasible to relocate the related frequency spectrum. Unlike the TT&C Station in Stanley which is located in a remote, restricted and isolated area, the TT&C Station in Tai Po Industrial Estate is located in an environment surrounded by offices and population. The 75-hectare Tai Po Industrial Estate is currently home to many famous local and international brands in the areas of food manufacturing, media services and lifestyle. Furthermore, it is located just 1.5 kilometers from the Tai Po Town Centre and a few hundred of meters from the nearest housing estates (Fu Shin Estate and surrounding villages), not to mention that the Tai Po Waterfront Park is located right next to the Industrial Estate.

4. In this respect, we have concerns over the TT&C Station located in the Tai Po Industrial Estate. It is stated in Paragraph 27 of the Consultation Paper that “restriction zones may need to be imposed for constraining the deployment of radio base stations of public mobile services in the 3.4 – 3.6 GHz band, in order to protect the reception of C-Band signals by existing TT&C Stations from harmful interference.” Should restriction zones be imposed and the amount of radiation power be regulated for the protection of C-Band signals by the existing TT&C Station in the Tai Po Industrial Estate, it would be technically infeasible for the MNOs to set up 5G-related radio base stations somewhere around the concerned areas abovementioned without over-spilling mobile signals towards the Industrial Estate. This would in turn unfairly deprive people of using 5G services there. In the premises, we recommend that the TT&C Station shall be relocated from Tai Po Industrial Estate to some other remote area in Hong Kong.

Use of 3.3 GHz Band for 5G Services

5. Regarding the use of frequency spectrum in the 3.3 – 3.6 GHz band for 5G services, we noted that technical trials have been conducted in the Mainland China since 2016. Despite it is not a 3GPP standard band, the 3.3 GHz band was identified, together with the 3.4 – 3.6 GHz band (3GPP Band 42), for 5G deployment in the Mainland. We believe that the ecosystem of 5G over the 3.3 GHz band shall be equally matured as the 3.4 – 3.6 GHz band owing to the strong demand driven by the mobile users and industry in the Mainland.

We learnt from OFCA’s website that currently the 3.3 GHz band is for radiolocation in Hong Kong. Please see below an excerpt of a table from OFCA’s website:

REGION 3 ALLOCATION	HONG KONG ALLOCATION	BAND PLAN AND EXISTING UTILISATION	REMARKS
3300 – 3400 RADIOLOCATION Amateur	3300 – 3400 RADIOLOCATION	3300 – 3400 (a) Radiolocation	(a) See note “B”

Note B: Frequency channels in this band can be re-used at different geographical locations or share-used by different users at the same geographical location. If vacant channels are available, the figure given in the corresponding “remarks” column indicates the percentage of the number of channels that are vacant. OFCA can assign the “assigned” frequency channels or “vacant” channels to new users.

In view of the above, we urge OFCA to make reference to the 5G deployment in the Mainland, particularly the utilization of the 3.3 GHz band for mobile services, and study the feasibility of using the said frequency band for 5G services in Hong Kong. An additional supply of 100 MHz radio frequency spectrum for 5G services would be significant to the telecommunications development in Hong Kong.

Long-term Spectrum Release Plan

6. As pointed out above, we urge the CA to speed up the process of freeing up more frequency bands and providing the industry with a spectrum roadmap for 5G, which is crucial for the long-term mobile network infrastructure planning in Hong Kong and achieving the Government’s goal of making Hong Kong a world leading smart city. We welcome that the CA issued a press release earlier in March 2017 on its work plan for making additional radio spectrum to meet the demand of public mobile services towards 2020¹. It would be desirable if the CA takes a more holistic approach to the review and development of 5G spectrum, like the telecommunication regulators in the UK and Australia².
7. Numerous papers and articles have reported on the emerging 5G networks and applications, which are expected to change the landscape of global communications. Referring to some public network benchmarking reports, Hong Kong is seen as lagging behind other neighboring countries like Singapore, Korea, Taiwan and Japan in terms of 4G network speed, while remaining competitiveness in 4G availability. Please refer to Appendix I and Appendix II for details³. The general observation is that the maximum speed achievable is directly proportional to the width of the aggregated spectrum assignable to each network. Hence, high speed countries tend to be those countries with smaller number of mobile operators as the average amount of spectrum assignable to each MNO is higher. These findings have illustrated the fact that the amount of spectrum (per MNO) in Hong Kong is inadequate for providing superb network speed and hence unable to deliver first-rate quality of experiences. In fact, the upcoming 5G technology demands for even more and wider frequency spectrum. A long-term spectrum roadmap is critical to facilitate MNOs to develop a competitive and advanced 5G network, which in turn enable more innovative services and applications such as Augmented Reality, Virtual Reality, Machine-to-Machine

¹ CA’s Website: “Work Plan for Making Available Additional Radio Spectrum to Meet the Demand of Public Mobile Services Towards 2020 and Beyond” on 21 March 2017.

² Australian Communications and Media Authority (ACMA) issued an occasional paper entitled “5G and mobile network developments – Emerging Issues” in February 2016 and UK’s regulator OFCOM published a paper entitled “Update on 5G Spectrum in the UK” in February 2017.

³ Source: <https://opensignal.com/reports/2017/06/state-of-lte>

applications like Internet of Things, etc. Network design and topology of a 5G network may vary significantly depending on what frequency bands the 5G spectrum be made available in and whether spectrum are made available at the same time or different phases. Hence it is utmost important to the industry that a certain and clear spectrum roadmap in Hong Kong is known as soon as possible.

III. Response to the Specific Questions in the Consultation Paper

Question 1: What are your views on the above Proposed Re-Allocation?

1. We generally support the assignment of 200 MHz of spectrum in the 3.4 – 3.6 GHz band for the provision of public mobile services; yet, we urge the CA to aggressively identify any other available frequency bands and free up more spectrum for 5G services. Regarding the partition of 100 MHz of spectrum in the 3.6 – 3.7 GHz band as a guard band, we are concerned whether the 100 MHz would be too much to serve the intended purpose. We would like to reserve our rights to comment at a later stage when we are provided with further technical details and hence in a better position to comment on the guard band.

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?

2. We support the principle of protecting the existing operators who are the licensees under the TO.

Please refer to Paragraph 2 of our submission above for further details.

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.

3. Please refer to Paragraphs 2 to 4 of our submission above.

In addition, we suggest that OFCA should arrange further meetings with the stakeholders from both the mobile and satellite industries to come up with a set of effective and feasible mitigating measures, as well as to address the details of the implementation of the mitigating measures, including the technical requirements and specifications of converter and filter, the feasibility study of restriction zones, and its related requirements, such as shielding structure to be installed by fixed satellite operators, the size of the restriction zones, etc.

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?

4. We generally agree with the proposed timeframe. Considering that Shenzhen has been selected by the Mainland authorities to carry out 5G technical trials with C-band since 2016, we suggest that OFCA closely monitor the status of 5G deployment in Shenzhen over the 3.4 – 3.6 GHz band, particularly the timeline, locations, scopes, and configuration requirements, as it is highly likely that Shenzhen will have C-band 5G network deployment earlier than 2020 and may cause undesirable interference to Hong Kong.

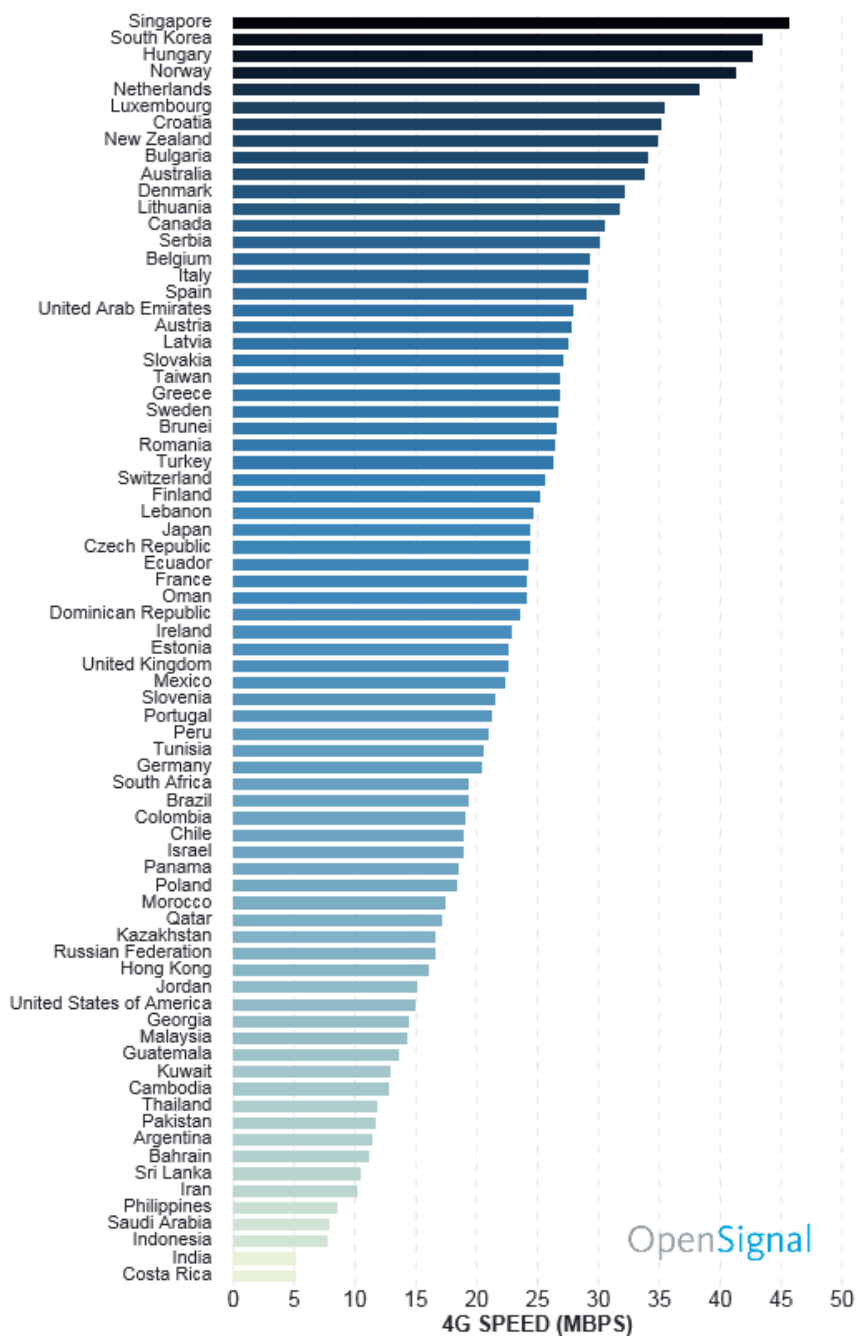
Question 5: What are your views on the need to protect the TT&C channels of the licensed satellite networks at their specific locations from any harmful interference to be caused by public mobile services?

5. Please refer to Paragraphs 3 and 4 of our submission above.

Question 6: Do you have any views on other aspects of or issues relevant to this consultation?

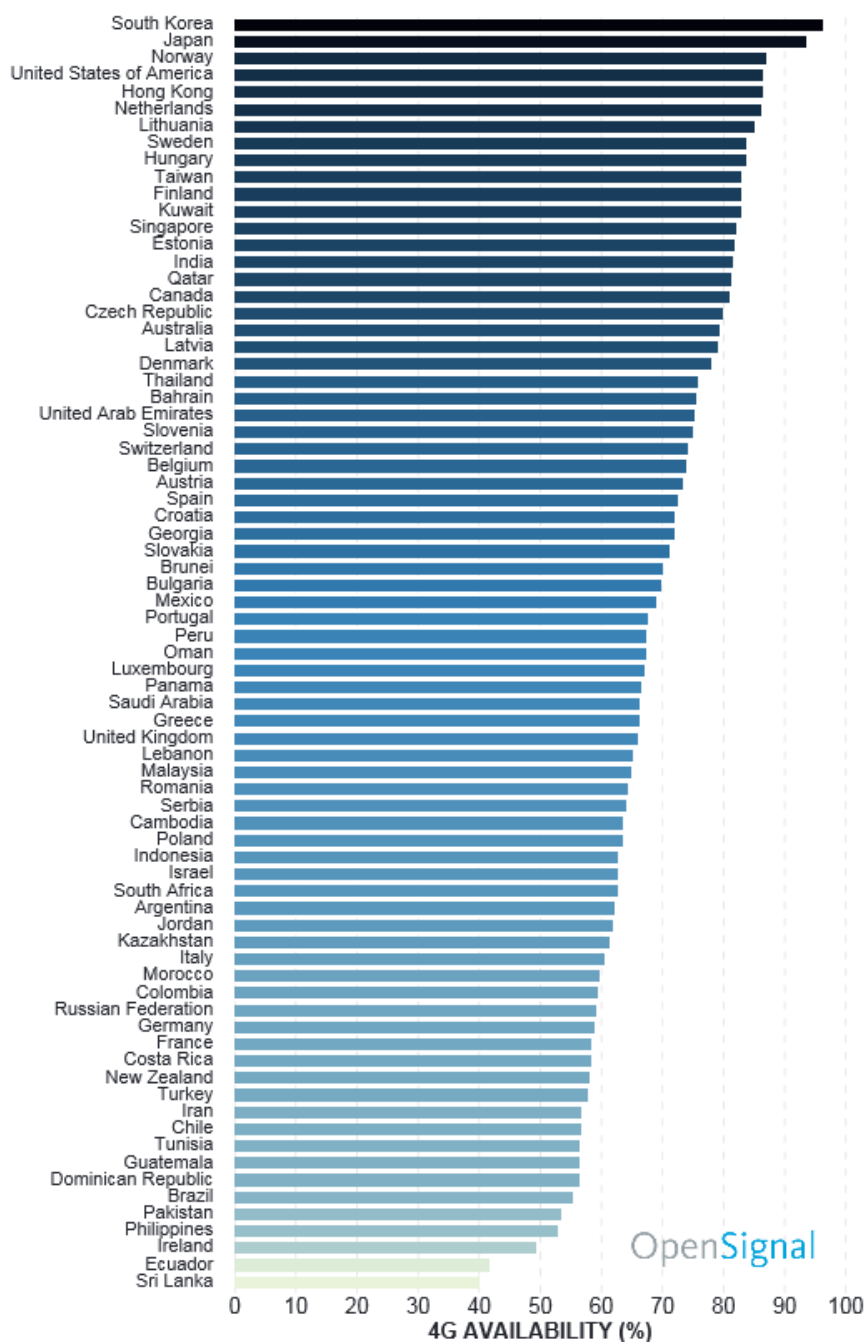
6. Please refer to Paragraphs 6 and 7 of our submission above.

APPENDIX I 4G Speed



OpenSignal Notes: This chart shows the average download connection speed that users in each country see when connecting to LTE networks. Though some operators sometimes refer to HSPA or other technologies as 4G, we only count LTE connections in our 4G speed tests. How fast a country's 4G speed is can depend on many factors: how much spectrum is devoted to LTE, whether it has adopted new 4G technologies like LTE Advanced, how densely networks are built and how much congestion is on those networks. In general, though, the countries with the fastest speeds tend to be the ones that have built LTE-Advanced networks and have a large proportion of LTE-Advanced capable devices.

APPENDIX II 4G Availability



OpenSignal Notes: This chart shows how consistently accessible 4G networks are in each country. Rather than measure geographic coverage, OpenSignal's availability metric tracks the proportion of time users have access to a particular network.

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