

## **COMMENTS OF TELESAT**

In response to “*The Second Consultation on 5G Mobile Services and Networks*”, 7 May 2019

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## **Introduction**

Telesat is grateful for the opportunity to provide its comments on the “*Second Consultation on 5G Mobile Services and Networks*”. These comments provide a brief introduction to Telesat followed by Telesat’s reply to Question 4i in the Consultation Document.

## **Telesat**

Telesat is headquartered in Ottawa, Canada and the regional office for Asia is in Singapore.

Telesat was established in 1969 with an initial mandate to provide satellite services to all parts of Canada. Telesat launched the world's first domestic commercial geostationary satellite in 1972 and, since that time, has evolved into an international, diversified, and end-to-end satellite services company, with an unparalleled reputation for innovation, technical and operational expertise and customer service.

In 2007, Telesat’s operations were combined with the satellite operations of Loral Skynet, a U.S. company with a strong technical background tied to the achievements of AT&T Skynet, Bell Labs and the Telstar program. As a result, Telesat greatly expanded its coverage and transitioned to a truly global operator. Presently, Telesat, is one of the largest and most successful satellite operators in the world and a leading provider of voice, data, video and IP networking services to the private sector and governments. The company’s advanced communications are delivered through its global fleet of 17 satellites. Telesat also operates a teleport and terrestrial infrastructure that is seamlessly integrated with its fleet. Through this combination of space and ground assets, Telesat’s communications solutions support the demanding requirements of customers throughout the world.

Telesat is now launching Telesat LEO, a revolutionary satellite constellation of highly advanced satellites in low-earth-orbit (~1,000 km from earth; ~35 times closer than traditional satellites) that will seamlessly integrate with terrestrial networks. The satellite system will operate in Ka-band, including the 28 GHz band, as further clarified in the section below. The global network will deliver fiber quality throughput (Gbps links; low latency) anywhere on earth. This is a highly flexible system that dynamically allocates capacity where there's demand, thus maximizing system efficiency. This is also a future-proof solution for backhaul cellular/5G traffic, including to rural and remote areas, and will provide high-speed broadband access to planes, ships, remote enterprise and government users.

As a highly advanced and efficient system with unparalleled economies of scale (multiple Tbps of usable capacity with global coverage), Telesat LEO will deliver to target markets a lower cost solution compared to any other satellite system. Telesat's Phase 1 LEO launched successfully on January 12, 2018. Project plans are moving forward aggressively and start of global service is targeted for 2022.

Telesat has a fifty-year history of successful innovations that have reshaped global communications. With the LEO constellation, Telesat will enable economical fiber quality broadband anywhere and, once again, transform global communications.

**Reply to Question 4i: “*Whether the industry agrees with the timelines on the expected availability of the next wave of 5G spectrum*”;**

Telesat would like to express its concerns in relation to the intended use of the 28GHz band, as described in the Consultation Document. It is Telesat's understanding that the Consultation

Document proposes that satellite use will not be allowed in the 27.5-28.5GHz portion of the band and will, in practice, be secondary to Mobile use in the 28.5-29.5GHz portion of the band.

Telesat wishes to add to the strong interest already expressed by other satellite operators in relation to the 28GHz band, by providing some details of its imminent use of the band by its novel Telesat LEO system and urges IMDA to consider an adequate balance between 5G deployment in Singapore and the global requirements of the satellite community

Telesat LEO will use the 27.5 – 29.1 GHz and 29.5 – 30.0 GHz bands in the Earth-to-space direction for both user terminals and gateway earth stations. As already mentioned, Telesat plans to start commercial service with its LEO Constellation in 2022, with South East Asia being a top priority region for both service provision and gateway deployment. In other words, availability of the 28GHz band is key to the provision of Telesat LEO services in Singapore and neighbouring Malaysia and Indonesia.

Use of the 28GHz band by terrestrial 5G will disrupt the global harmonised framework for FSS and will be incompatible with RR 5.516B, which identifies the following portions of the 28GHz band for high-density applications in the Fixed Satellite Service (FSS) in Region 3: 28.45-28.94 GHz, 28.94-29.1 GHz and 29.46-29.5 GHz. A requirement to protect terrestrial 5G services in the 28.5-29.5GHz portion of the band will severely restrict, if not prohibit, ubiquitous FSS use of the band, as the current studies under WRC-19 AI 1.5 clearly show. Given that usage of aeronautical and maritime Earth Stations in Motion (ESIMS) is more and more widespread and that Singapore is a major maritime and aeronautical hub in the region, terrestrial 5G deployment on a primary basis in the 28 GHz band will limit, if not preclude, fulfillment of growing consumer and enterprise demand for ESIMs. Satellite service provision to vessels will be in practice not be allowed in and

around Singaporean waters, while gate-to-gate aeronautical service, now demanded by most airlines, will also be impossible. Further to this, given the geographical position of Singapore, the decision will inevitably impact also neighbouring Malaysia and Indonesia.

The 27.5-29.5GHz band is also essential for feeder link earth stations for a large number of satellite systems with payloads in Ka and other frequency bands, including Telesat LEO. While sharing between terrestrial fixed services and fixed FSS earth stations is feasible, use of the 28GHz band for 5G will preclude feeder link earth station deployment in a country the size of Singapore.

The clearest evidence of the value of the 28 GHz band to the satellite community is the very large number of current and future satellite systems designed to operate in the band of which the IMDA has already been informed, including Telesat LEO. Investments of billions of dollars have been committed to new and innovative satellite systems which are providing and will continue to provide tremendous social and economic value, by connecting the unconnected on land, at sea and in the air, and providing essential connectivity services, such a cellular and 5G backhaul, in an efficient and economic manner.

As a final remark, Telesat is of the opinion that terrestrial 5G would be well accommodated in the 26GHz band. Also, WRC-19 AI 1.13 is studying more than 30GHz of spectrum to accommodate 5G in microwave frequencies.

Should IMDA proceed with terrestrial 5G deployment in the lower part of the 28GHz band, Telesat respectfully asks IMDA to: (i) reconsider the priority given to terrestrial 5G in the 28.5-29.5GHz portion of the band; and (ii) permit FSS use of the 27.5-28.5GHz portion of the band on, at least a non interference basis. This is also in order to establish a fairer and more balanced spectrum environment and provide critical regulatory stability for all services concerned.