



26 February 2024

Federal Office of Communications (OFCOM)
Zukunftstrasse 44
P.O. Box 256
2501 Biel

RE: Public consultation regarding the allocation of mobile radio frequencies available from 2029 for the provision of telecommunication services in Switzerland

Starlink Internet Services Limited (“SpaceX”) appreciates the opportunity to share its comments to the Federal Office of Communications (“OFCOM”) regarding the allocation of mobile radio frequencies available from 2029 for the provision of telecommunication services in Switzerland. SpaceX offers these comments with an eye toward increasing the availability of communication services wherever and whenever they are needed. OFCOM has an opportunity in this allocation process to consider future trends in convergence and cooperation and suggests that future frameworks for traditional mobile (“IMT”) bands are flexible enough to encompass new services like satellite direct-to-handset to allow service to unmodified mobile handsets to connect to satellite in locations where terrestrial mobile coverage is unavailable. Further, SpaceX offers its perspective on appropriate protections of spectrum bands that are critically important for the provision of satellite services.

SpaceX Overview

SpaceX is a privately-held company that is revolutionizing space technologies, with the ultimate goal of enabling humanity to become a multi-planetary species. As the world's leading provider of launch services and the only provider with an orbital class reusable rocket – SpaceX has deep experience with both spacecraft and on-orbit operations and has now deployed Starlink - the world's most advanced high-speed, low latency broadband network in space.

Starlink is the world's first Low Earth Orbit satellite constellation that leverages both ground-to-satellite and satellite-to-satellite communications via optical Intersatellite links to provide truly global coverage anywhere on Earth. SpaceX has now launched over 5,000 Starlink satellites into low earth orbit. Since launching commercial services in October 2020, Starlink now has over two million broadband subscribers. SpaceX began Starlink operations in Switzerland in August 2021 and continues to serve Swiss households and businesses with high-speed, low latency broadband service.

Starlink now enables global connectivity for everyday use cases including remote work, streaming, distance learning, and video calls as well as emergency response, agriculture or business applications. Whether a subscriber is at home or school or is moving hundreds of kilometers an hour at sea or in-flight, Starlink is providing fiber-like connectivity anytime and anywhere, helping to eliminate the digital divide and providing critical connectivity when communities are impacted by crises.



800, 900, 1800, 2100 and 2600 MHz

Beyond its Starlink satellite broadband connectivity, in August 2022, SpaceX announced its first Direct to Cell partnership, signaling a new era in satellite connectivity by connecting directly to unmodified mobile handsets. Starlink Direct to Cell will deliver connectivity to users on terrestrial partner networks in areas or at times when terrestrial capabilities are otherwise not possible. SpaceX has invested millions of dollars to design its Starlink Direct to Cell system with the capability to operate over a wide range of spectrum bands using commercially available mobile phones operating on the LTE standard, including many of the bands under consideration in this consultation.

Since that initial announcement, SpaceX has received tremendous interest from mobile partners around the world that are able and willing to leverage their authorized spectrum to enable satellite direct-to-cell capabilities. On January 2nd, 2024, SpaceX launched its first Direct to Cell enabled satellites onboard a Falcon 9 rocket. Just six days later, SpaceX successfully sent and received the first SMS messages using Starlink satellites. SpaceX plans to continue launching Direct to Cell-capable satellites throughout 2024 and to launch its commercial messaging services later in this year with voice and data service to be brought online in 2025. SpaceX and its growing list of partners are on the cusp of delivering this truly innovative direct-to-device capability with the potential to benefit millions across the nation and around the world.

In March 2023, Salt and SpaceX announced an agreement to provide Direct to Cell coverage in Switzerland. This partnership model will leverage SpaceX's satellite capabilities and Salt's terrestrial infrastructure and spectrum licenses to deliver an innovative and potentially life-saving service.

As OFCOM considers future use of these bands, SpaceX urges OFCOM to consider a flexible spectrum licensing framework that can enable the deployments of innovative technologies, like Starlink's Direct to Cell service. SpaceX encourages OFCOM to adopt an approach that facilitates the use of satellite applications in the 800, 900, 1800, 2100 and 2600 MHz bands. As a general matter, SpaceX strongly supports spectrum frameworks that maximizes future flexibility in technology deployments, encourages co-existence between satellite and other users, and facilitates innovative commercial arrangements to deliver service to consumers in Switzerland

40 and 26 GHz

The Starlink system has been designed to make efficient use of radio spectrum resources by optimizing its ability to flexibly share spectrum with other licensed satellite and terrestrial users, including by using advanced beam-forming and digital processing technologies. SpaceX currently connects to the customer user terminals in the Ku-band for both uplink and downlink frequencies, with gateway links in the Ka and E-bands, but as demand grows, it will be important to look ahead to other bands to meet evolving consumer needs.

As OFCOM contemplates future uses for the 26 GHz band, SpaceX urges OFCOM to consider the effect mobile services can have on other services in adjacent bands. Specifically, SpaceX and other Fixed Satellite Service (FSS) operators rely on the adjacent spectrum band (the "28 GHz" band, beginning at 27.5 GHz) and SpaceX encourages OFCOM to ensure these critical services are



appropriately protected. This could be achieved by contemplating reasonable out-of-band emissions limits to ensure protection of incumbents in adjacent bands, as set forth in ECC Decision (18)06. OFCOM should ensure that any new spectrum authorizations for mobile services do not constrain satellite services from taking advantage of the full band for which they are authorized to allow Swiss citizens to get the maximum benefit from next generation satellite services.

As SpaceX continues to explore innovative approaches to expand its service capacity, we are beginning to plan for deployments in other spectrum bands, including the 42 GHz band. In October 2023, The Federal Communications Commission (FCC) granted SpaceX a license to launch satellites capable of operating in the V-band: 37.5-42.5 GHz (space-to-Earth); and 47.2-50.2 GHz and 50.4-51.4 GHz (Earth-to-space) (“V-band frequencies”). This license will allow SpaceX to augment its broadband service capabilities and leverage its next-generation (“Gen2”) satellite constellation for satellite internet users around the world.

As SpaceX deploys V-band satellites, SpaceX asks OFCOM to make these V-band frequencies available for next-generation satellite systems, like Starlink, to bring the benefits from this high-capacity spectrum to the people of Switzerland. SpaceX will add V-band capabilities to satellites in its Gen2 system and leverage SpaceX’s existing ground equipment as well as add new equipment that aims to optimize performance for consumers.

As OFCOM contemplates rules for use of the 40 GHz band, including spectrum sharing and licensing mechanisms, SpaceX urges OFCOM to consider a licensing framework that enables co-existence with other services like satellite V-band, as contemplated in ECC Decision (22)06. SpaceX will make use of the entire 37.5-42.5 GHz band to communicate between the Starlink satellites and SpaceX gateway earth stations at distinct locations, making coordination between with other users feasible. The availability of contiguous spectrum is critical for FSS gateway use, and SpaceX believes OFCOM should more broadly support FSS assignment at specific locations in the 37.5-42.5 GHz range for space-to-Earth connectivity for next generation satellites in addition to supporting Earth-to-space communication in the ranges 47.2-50.2 and 50.4-51.4 GHz.

To facilitate spectrum sharing and co-existence in the 40 GHz band, SpaceX encourages OFCOM to consider developing a multi-service light-licensing approach in bands such as the 40 GHz band as it will enable a speedy and efficient review and approval timeline through the implementation of automated basic compliance and coexistence checks. This approach would reduce administrative cost and labor associated with manual reviews for all but the most complex interference scenarios; facilitate coordination between different co-primary services through a common platform; and promote rapid deployment of ground equipment for high-speed, low-latency wireless networks, benefitting Swiss citizens, government agencies and businesses. This model could dramatically improve both the satellite earth station licensing process in Switzerland while providing better connectivity for Swiss consumers and enterprises.

SpaceX encourages the development of a database for operators to register ground equipment on a first-come, first-served, site-by-site basis under a single set of technical rules that would only require a minor adaptation of current rules and online processes. To this end, SpaceX believes reporting should be kept simple, consistent, and not significant administrative work on the part of



the operator or of OFCOM. The most critical reporting elements are the site/link location, relevant technical parameters as well as regular checks to ensure the sites or links are still operational and have not been relocated. This approach can facilitate co-existence between existing and future operators in the band.

SpaceX welcomes the opportunity to work closely with OFCOM as it develops frameworks for future assignment and use of these spectrum bands.

Best regards,

A handwritten signature in blue ink that reads "Brett Tarnutzer".

Brett Tarnutzer
Director, Satellite Policy
SpaceX

Brett.Tarnutzer@SpaceX.com